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NSA MID SOUTH
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GROUNDWATER WELL MANAGEMENT PLAN VOLUME 2 OF 2 APPENDICES C AND D
MILLINGTON SUPPACT TN
11/1/2001
ENSAFE INC

GROUNDWATER WELL MANAGEMENT PLAN

NAVAL SUPPORT ACTIVITY MID-SOUTH MILLINGTON, TENNESSEE

VOLUME II of II

APPENDICES C and D

REVISION: 6

CONTRACT NUMBER: N62467-89-D-0318
CTO-0094
CTO-0146

Prepared for:

Department of the Navy
Southern Division
Naval Facilities Engineering Command
Charleston, South Carolina

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
Memphis, Tennessee 38134
(901) 372-7962

November 2001

GROUNDWATER WELL MANAGEMENT PLAN

NAVAL SUPPORT ACTIVITY MID-SOUTH MILLINGTON, TENNESSEE

VOLUME II of II

APPENDICES C and D

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APPENDIX C

WELL CONSTRUCTION LOGS

NOTE: THE FOLLOWING WELL LOGS ARE NOT AVAILABLE:

GC01	007G08LS
N76101	007G50LF
OPC01	007G51LF
PWN1	007GMCNA
PWN2	020GPZ01
RWY09	020GPZ02
RW-01	020GPZ03
S17201	039GPZ04
TW01	039GPZ05
005G04LS	040GPW01
005G05LS	757B2LD
005G08LS	757B3LD
005MW08LS	757B4LD
005G09LS	0BGG03UC

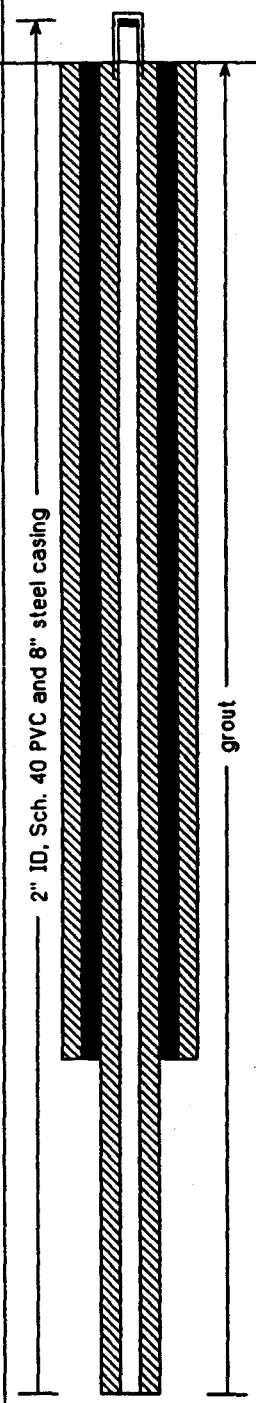
EnSafe/Allen & Hoshall

Monitoring Well BG1LF
(BGMW01LF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #1*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1545 on 1-09-95*	TOC Elevation: *286.57 feet msl*
Completed at *1645 on 1-09-95*	Depth to Groundwater: *30.53 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.04 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *68.0 feet*
Geologist: *BB, JC, JAK, RL, WP*	Well Screen: *54.8 to 64.8 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silty loam with roots.	
								Silt, clayey, light brown, moist.	
5			1	80	8.1				
10			2	100	1.2			Silt, clayey, light brown, laminated, some organic inclusions, moist, low plasticity.	
15			3	125	BG		ML	Silt, clayey, brown to reddish brown, becoming more plastic.	
20			4	120	BG			Silt, trace clay, slightly plastic, moderate yellow brown.	
25			5	120	BG			Silt, some clay, yellowish brown to yellowish gray, traces of organics, staining, slightly plastic, moist.	
30			6	110	BG			Sand, fine with silt and gravel, yellowish orange to reddish brown, moist to wet.	
							SC		
35			7	82	BG			Sand, silty with clay, yellowish brown to brownish gray. Some light brown mottling, some gravel, stiff, slightly plastic, moist.	
							GP	Sand, fine to coarse grained with gravel, some silt, dark yellowish orange.	
40			8	60	BG				

WELL DIAGRAM



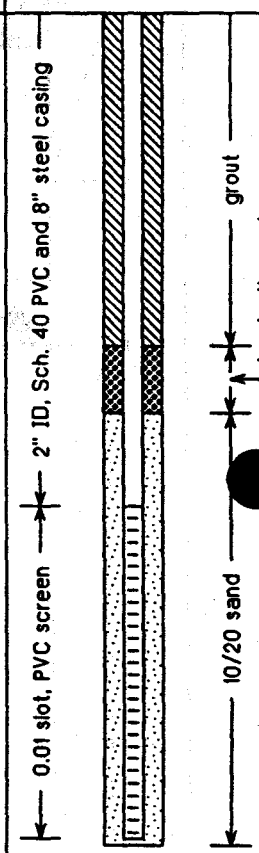
EnSafe/Allen & Hoshall

Monitoring Well BG1LF
(BGMW01LF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #1*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1545 on 1-09-95*	TOC Elevation: *286.57 feet msl*
Completed at *1645 on 1-09-95*	Depth to Groundwater: *30.53 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.04 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *68.0 feet*
Geologist: *BB, JC, JAK, RL, WP*	Well Screen: *54.8 to 64.8 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			9	100	BG				
50							GP		
			10	100	BG				
55									
60									
			11	95	BG				
65								Sand, fine, dark yellowish orange to yellowish gray, ferrigenous layers, wet.	
							SC	Clay, sandy and silty, medium gray to moderate dark gray.	
			12	100	BG			End of boring at 68'.	
70									
75									
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall

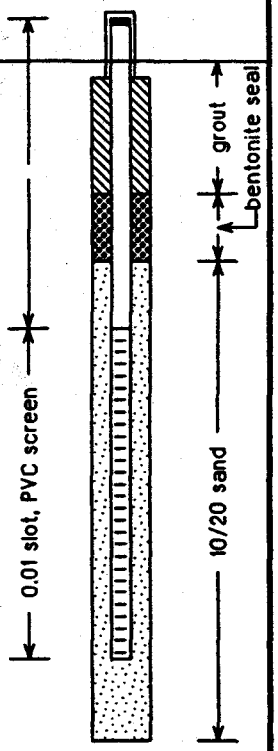
Monitoring Well BG1LS

(BGMW01LS)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #1*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1545 on 1-10-95*	TOC Elevation: *286.10 feet msl*
Completed at *1645 on 1-10-95*	Depth to Groundwater: *10.71 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *275.39 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *BB, JC, JAK, RL, WP*	Well Screen: *8 to 18 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silty loam with roots.	
								Silt, clayey, light brown, moist.	
5			1	80	8.1				
10			2	100	1.2		ML	Silt, clayey, light brown, laminated, some organic inclusions, moist, low plasticity.	
15			3	125	BG			Silt, clayey, brown to reddish brown, becoming more plastic.	
20			4	120	BG			Log information taken from the boring for the lower fluvial at BG-1.	
25									
30									
35									
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

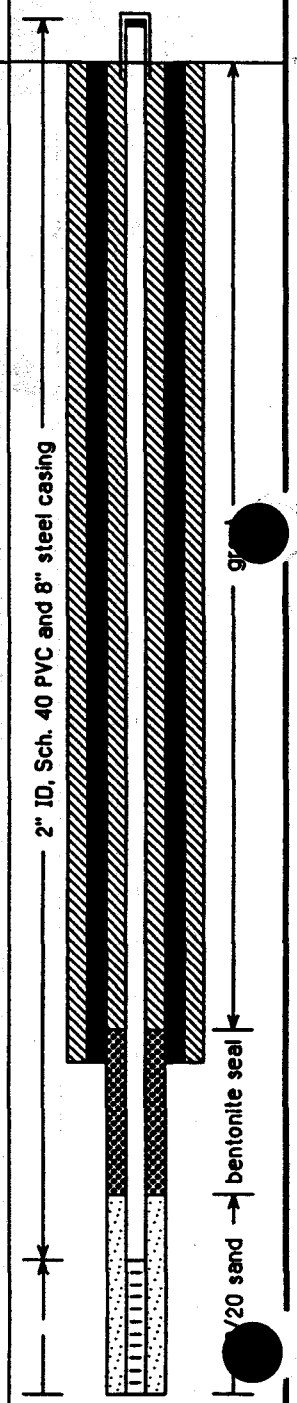
Monitoring Well BG1UF

(BGMW01UF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #1*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1115 on 1-14-95*	TOC Elevation: *286.68 feet msl*
Completed at *1645 on 1-14-95*	Depth to Groundwater: *30.62 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.06 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *46.0 feet*
Geologist: *BB, JC, JAK, RL, WP*	Well Screen: *36.0 to 46.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silty loam with roots.	
								Silt, clayey, light brown, moist.	
5			1	80	8.1				
10			2	100	1.2			Silt, clayey, light brown, laminated, some organic inclusions, moist, low plasticity.	
15			3	125	BG		ML	Silt, clayey, brown to reddish brown, becoming more plastic.	
20			4	120	BG			Silt, trace clay, slightly plastic, moderate yellow brown.	
25			5	120	BG			Silt, some clay, yellowish brown to yellowish gray, traces of organics, staining, slightly plastic, moist.	
30			6	110	BG			Sand, fine with silt and gravel, yellowish orange to reddish brown, moist to wet.	
							SC		
35			7	82	BG			Sand, silty with clay, yellowish brown to brownish gray. Some light brown mottling, some gravel, stiff, slightly plastic, moist.	
							GP	Sand, fine to coarse grained with gravel, some silt, dark yellowish orange.	
40			8	60	BG				

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well BG1UF
(BGMW01UF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #1*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1115 on 1-14-95*	TOC Elevation: *286.68 feet msl*
Completed at *1645 on 1-14-95*	Depth to Groundwater: *30.62 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.06 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *46.0 feet*
Geologist: *BB, JC, JAK, RL, WP*	Well Screen: *36.0 to 46.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45			9	100	BG		GP			10/20 sand
								Log information taken from the boring for the lower fluvial at BG-1.		
50										
55										
60										
65										
70										
75										
80										

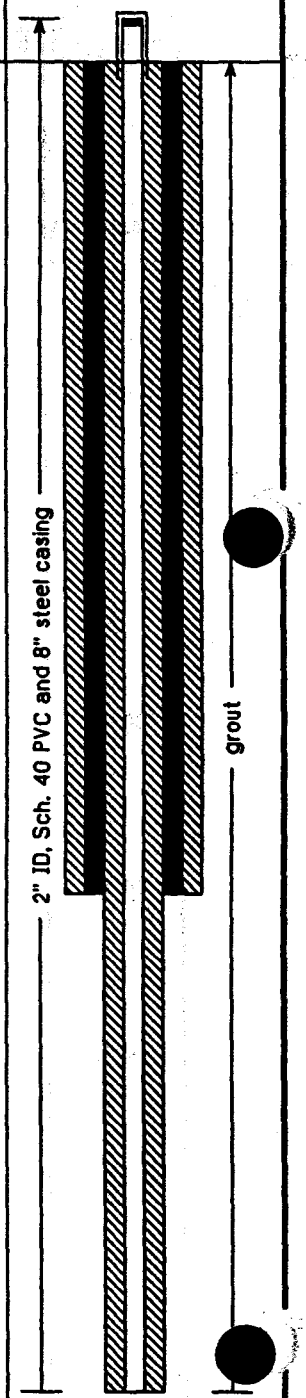
EnSafe/Allen & Hoshall

Monitoring Well BG2LF
(BGMW02LF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #2*
Project No.: *N0094*	Surface Elevation: *272.66 feet msl*
Started at *0745 on 1-17-95*	TOC Elevation: *272.40 feet msl*
Completed at *0845 on 1-17-95*	Depth to Groundwater: *12.45 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *259.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *87.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and roots.	
5			1	75	BG			Silt, clayey, yellow brown to gray brown, moist, soft.	
10			2	50	BG			Silt, clayey, yellow gray to olive gray, stained yellow orange, laminated with orange to brown thin striations.	
15			3	87.5	BG		ML		
20			4	75	BG				
25			5	100	BG			Silt, clayey, light olive gray to yellow gray with iron staining, trace gravel. Silt, clayey, light olive gray, less iron staining.	
									243.7
30								Sand, silty, trace clay, some gravel, yellow brown to gray brown. Sand, medium to coarse with gravel, orange brown to yellow.	
35			6	108	BG		GP	Sand, fine, with trace gravel, grayish pink to grayish orange, some yellow orange mottling.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

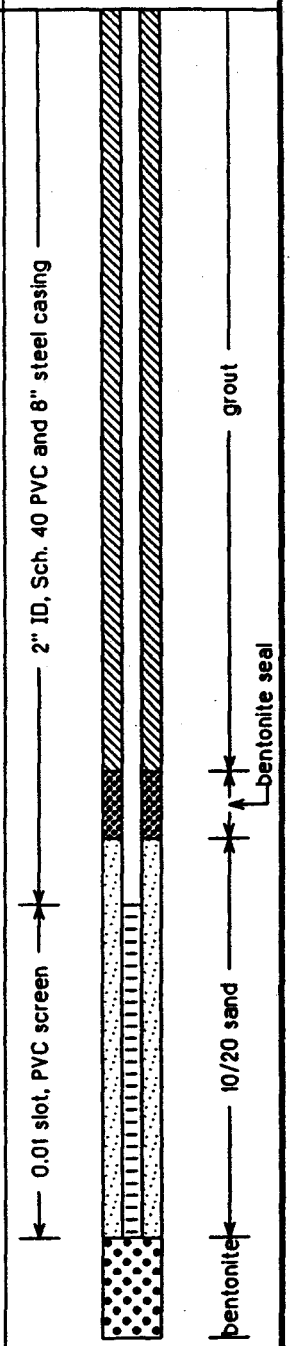
Monitoring Well BG2LF

(BGMW02LF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #2*
Project No.: *N0094*	Surface Elevation: *272.66 feet msl*
Started at *0745 on 1-17-95*	TOC Elevation: *272.40 feet msl*
Completed at *0845 on 1-17-95*	Depth to Groundwater: *12.45 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *259.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *87.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			7	90	BG			Same as above but dark yellowish orange. Sand, gravelly, silty, dark yellowish orange, wet.	
50									
55			8	100	BG		GP	Sand, very fine to fine, silty, traces of clay, yellowish gray to grayish orange.	
60									
65			9	105	BG				
70									
75			10	120	BG		SC	Sand, fine, clayey and silty, moderate gray to brownish gray, laminated, soft to stiff.	195.7
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well BG2LF (BGMW02LF)
Project: *NAS Memphis*	Location: *Millington, TN. Background Site #2*
Project No.: *N0094*	Surface Elevation: *272.66 feet msl*
Started at *0745 on 1-17-95*	TOC Elevation: *272.40 feet msl*
Completed at *0845 on 1-17-95*	Depth to Groundwater: *12.45 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *259.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *87.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
85			11	100	BG		SC	End of boring at 87'.	185.7	bentonite
90										
95										
100										
105										
110										
115										
120										

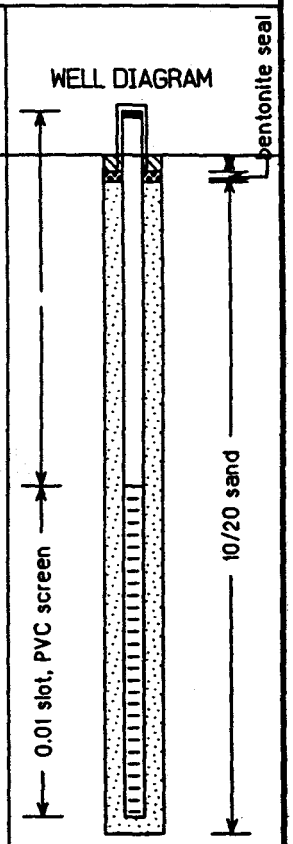
EnSafe/Allen & Hoshall

Monitoring Well BG2LS
(BGMW02LS)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #2*
Project No.: *N0094*	Surface Elevation: *271.82 feet msl*
Started at *0745 on 1-12-95*	TOC Elevation: *272.11 feet msl*
Completed at *0845 on 1-12-95*	Depth to Groundwater: *8.32 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *263.79 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and roots.	
			1	75	BG			Silt, clayey, yellow brown to gray brown, moist, soft.	
5									
10							ML	Silt, clayey, yellow gray to olive gray, stained yellow orange, laminated with orange to brown thin striations.	
			2	50	BG				
15			3	87.5	BG				
20			4	75	BG			Log information taken form the boring for the lower fluvial well BG-2.	251.8
25									
30									
35									
40									

WELL DIAGRAM



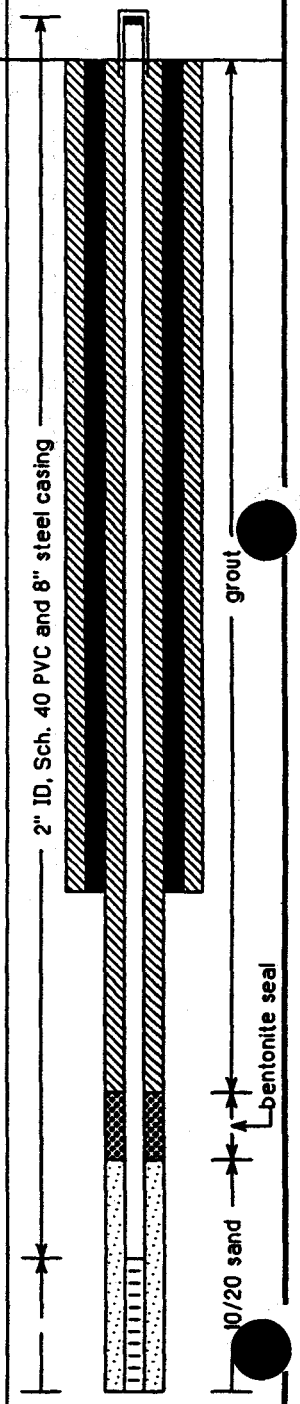
EnSafe/Allen & Hoshall

Monitoring Well BG2UF
(BGMW02UF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #2*
Project No.: *N0094*	Surface Elevation: *271.76 feet msl*
Started at *0745 on 1-17-95*	TOC Elevation: *274.74 feet msl*
Completed at *0845 on 1-17-95*	Depth to Groundwater: *12.31 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *262.43 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *46.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and roots.	
			1	75	BG			Silt, clayey, yellow brown to gray brown, moist, soft.	
5									
10			2	50	BG			Silt, clayey, yellow gray to olive gray, stained yellow orange, laminated with orange to brown thin striations.	
15			3	87.5	BG		ML		
20			4	75	BG				
25			5	100	BG			Silt, clayey, light olive gray to yellow gray with iron staining, trace gravel. Silt, clayey, light olive gray, less iron staining.	
									242.8
30								Sand, silty, trace clay, some gravel, yellow brown to gray brown. Sand, medium to coarse with gravel, orange brown to yellow.	
35							GP		
			6	108	BG			Sand, fine, with trace gravel, grayish pink to grayish orange, some yellow orange mottling.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well BG2UF

(BGMW02UF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #2*
Project No.: *N0094*	Surface Elevation: *271.76 feet msl*
Started at *0745 on 1-17-95*	TOC Elevation: *274.74 feet msl*
Completed at *0845 on 1-17-95*	Depth to Groundwater: *12.31 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *262.43 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *46.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45			7	90	BG		GP	Same as above but dark yellowish orange.	225.8	10/20 sand
								Log information taken form the boring for the lower fluvial well BG-2.		
50										
55										
60										
65										
70										
75										
80										

EnSafe/Allen & Hoshall

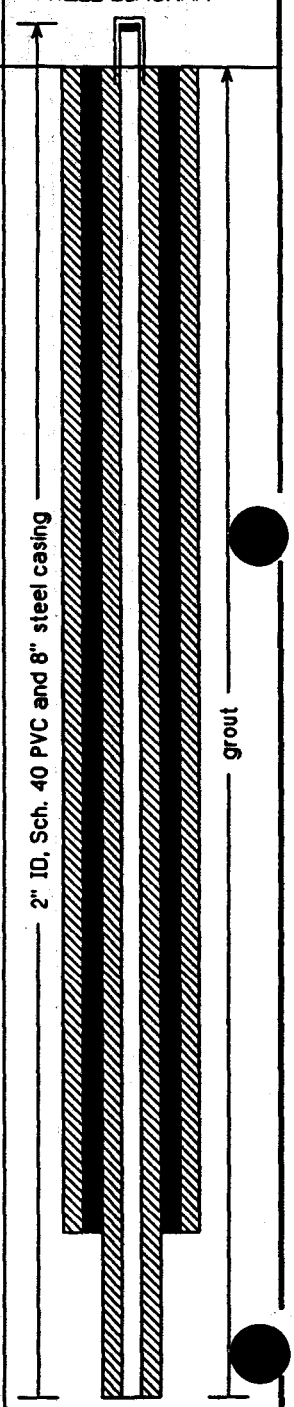
Monitoring Well BG4LF

(BGMW04LF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #4*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1000 on 1-11-95*	TOC Elevation: *feet msl*
Completed at *1115 on 1-11-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *76.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *60 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and debris.	
			1	100	BG			Silty clay, pale olive with reddish brown mottling, stiff.	
5									
10								Clayey silt, yellow gray to yellow brown, mottled with reddish brown.	
			2	100	BG			Clayey silt, yellow gray to yellow brown mottled yellowish orange, laminated, low plasticity.	
15									
20			3	100	BG		ML	Silt, medium gray, massive, low plasticity, traces of iron inclusions.	
25								Silt, clayey, medium gray stained yellowish orange, plastic.	
			4	100	BG				
30								Silt, clayey, yellow gray to olive gray.	
35									
			5	100	BG				
40							GP	Sand, silty, with gravel, yellowish gray to yellowish brown, mottled yellow orange, moist to wet	

WELL DIAGRAM



EnSafe/Allen & Hoshall

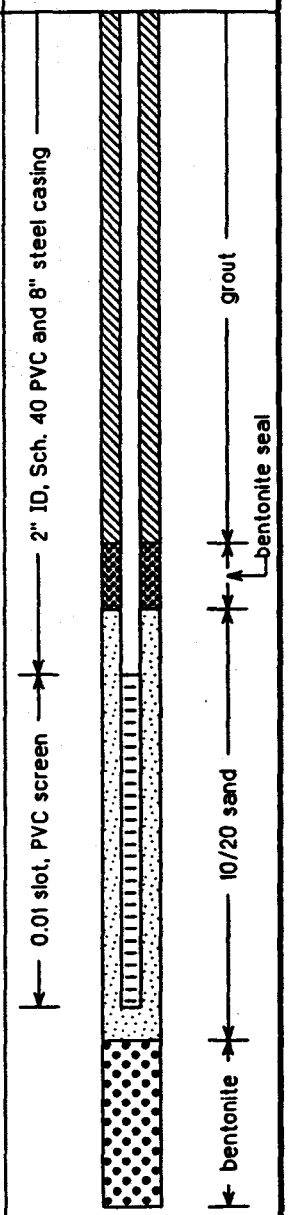
Monitoring Well BG4LF

(BGMW04LF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #4*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1000 on 1-11-95*	TOC Elevation: *feet msl*
Completed at *1115 on 1-11-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *76.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *60 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			6	108	BG			Gravel, sandy, fine to very coarse sand, traces of silt, wet, yellow gray.	
45			7	100	BG				
50									
55			8	90	BG		GP	Same as above with color changing to dark yellowish orange to moderate yellowish brown.	
60									
65			9	85	BG				
70								Sand with clay, sand is yellow gray stained yellowish orange, clay light brownish gray, moist to wet.	
75			10	100	BG		SC	Sand, very fine, clay, medium dark gray, olive black laminations.	
80								End of boring at 76'	

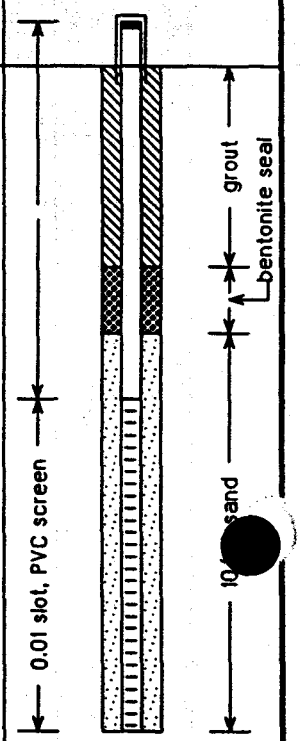
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well BG4S (BGMW04LS)
Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1000 on 1-11-95*	TOC Elevation: *feet msl*
Completed at *1115 on 1-11-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and debris.	
			1	100	BG			Silty clay, pale olive with reddish brown mottling, stiff.	
5									
10							ML	Clayey silt, yellow gray to yellow brown, mottled with reddish brown.	
			2	100	BG			Clayey silt, yellow gray to yellow brown mottled yellowish orange, laminated, low plasticity.	
15									
20			3	100	BG			Log information taken from the boring for the lower fluvial well bg-4.	
25									
30									
35									
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

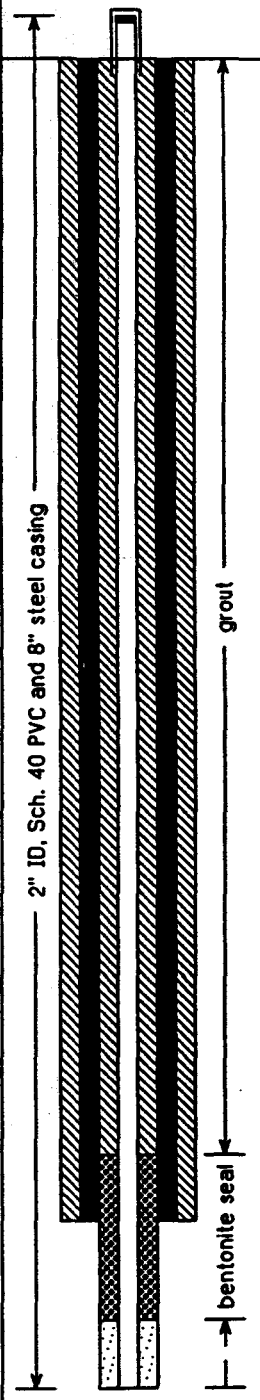
Monitoring Well BG4UF

(BGMW04UF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #4*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1000 on 1-16-95*	TOC Elevation: *feet msl*
Completed at *1115 on 1-16-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and debris.	
5			1	100	BG			Silty clay, pale olive with reddish brown mottling, stiff.	
10								Clayey silt, yellow gray to yellow brown, mottled with reddish brown.	
			2	100	BG			Clayey silt, yellow gray to yellow brown mottled yellowish orange, laminated, low plasticity.	
15									
20			3	100	BG		ML	Silt, medium gray, massive, low plasticity, traces of iron inclusions.	
25								Silt, clayey, medium gray stained yellowish orange, plastic.	
			4	100	BG				
30								Silt, clayey, yellow gray to olive gray.	
35			5	100	BG				
40							GP	Sand, silty, with gravel, yellowish gray to yellowish brown, mottled yellow orange, moist to wet	

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well BG4UF (BGMW04UF)
Project: *NAS Memphis*	Location: *Millington, TN. Background Site #4*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1000 on 1-16-95*	TOC Elevation: *feet msl*
Completed at *1115 on 1-16-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
			6	108	BG			Gravel, sandy, fine to very coarse sand, traces of silt, wet, yellow gray.		0.01 slot, PVC screen; 10/20 sand
45			7	100	BG		GP			
50								Log information taken from the boring for the lower fluvial well bg-4.		
55			8	90	BG					
60										
65										
70										
75										
80										

ENSAFE

BORING LOG of 0BGG04UC

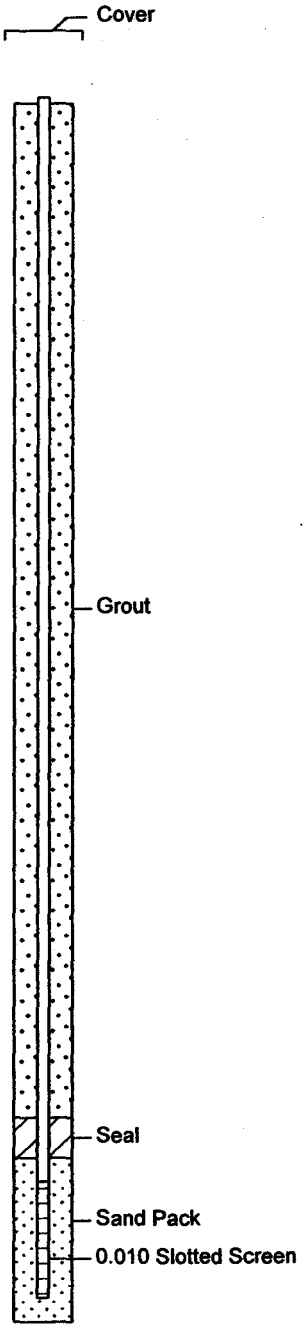
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1420 7/27/98	Northing	: 387054.40 (estimated)
Finished	: 0830 7/28/98	Easting	: 811514.20 (estimated)
Drilling Method	: Rotasonic	TOC Elevation	: 266.34 (estimated)
Drilling Company	: Allinance Drilling	Total Depth	: 105 feet
Geologist	: D. Ladd	Well Screen	: 93 to 103 feet

Depth in Feet	Surf. Elev. 264.30	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	264						Fill and debris
5	259						Silty clay, pale olive w/ reddish brown mottling, stiff
10	254						Clayey silt, yell gray to yellow brown, mottled w/ reddish brown
15	249						Clayey silt, yellow gray to yellow brown mottled w/ yellowish orange, laminated, low plasticity
20	244					ML	Silt, med. gray, massive, low plasticity, traces of iron inclusions
25	239						Silt, clayey, med. gray stained yellowish orange, plastic
30	234						Silt, clayey, yellow gray to olive gray
35	229						
40	224						Sand, silty, w/ gravel, yellowish gray to yellowish brown, mottled yellow orange, moist to wet
45	219						Gravel, sandy, fine to very coarse sand, traces of silt, wet, yellow gray
50	214						
55	209					GP	Same above with color changing to dark yellowish orange to moderate yellowish brown
60	204						
65	199						Lithology above 69 was taken from boring log of BGMW04LF
70	194	1	100				(69 - 71) Sand, very fine, and clay, med. Lt. gray mottled w/ dark yellowish orange, contains gravel at very top, wet
75	189						
80	184	2	110				(71 - 75) Sand, very fine, and clay, med. Lt. gray, micaceous
85	179						(75 - 85) Sand, very fine and clay, med. Lt. gray to olive gray, almost no clay from 76 to 79, clay content increases below 79 and contains scattered clay seams, micaceous, lignitic, especially from 83 to 85, wet
90	174	3	110			SC	
95	169						(85 - 95) Same as above, very lignitic, wet
100	164	4	100				(95 - 103) Same as above, clay seam from 99 to 100, lignitic
105	159						(103 - 105) Clay, sandy, med. light gray to olive gray, lignitic, hard and stiff
110							

Geoprobe: 0BGG04UC
Elev.: 266.34



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09-17-1999

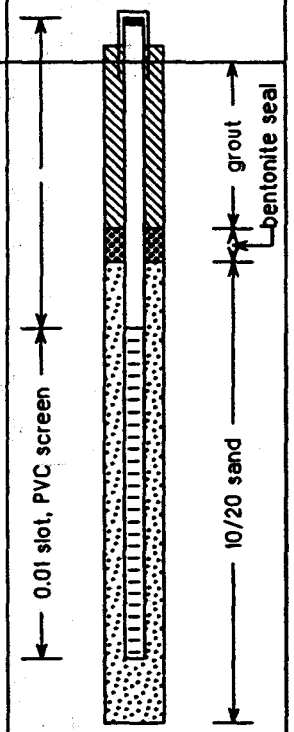
EnSafe/Allen & Hoshall

Monitoring Well BG5S
Boring BG5S (BGMW05LS)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #5*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1440 on 1-12-95*	TOC Elevation: *feet msl*
Completed at *1540 on 1-12-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *8 to 18 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silty loam with roots.	
			1	75	BG			Silt, clayey, yellowish brown to yellowish gray, with orange brown mottling, moist, plastic.	
5									
10							ML		
			2	75	BG				
15								Silt, clayey, medium gray, massive, moist.	
20			3	125	BG			Log information taken from the boring for the lower fluvial at BG-5.	
25									
30									
35									
40									

WELL DIAGRAM



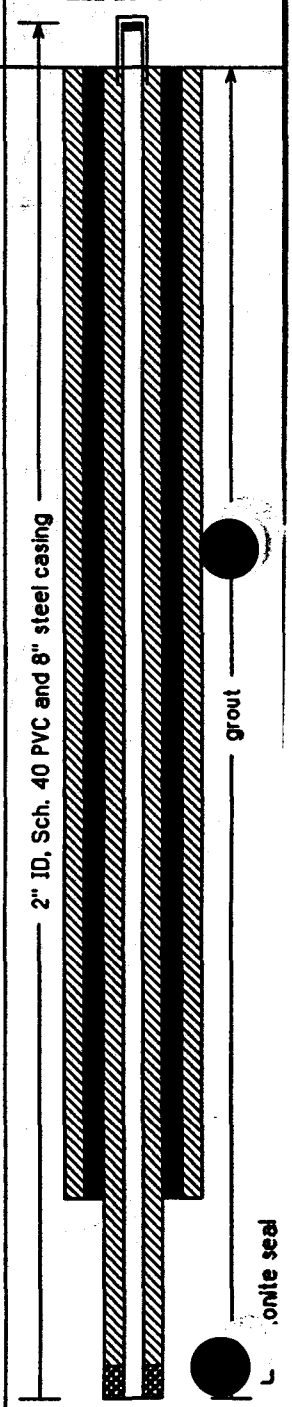
EnSafe/Allen & Hoshall

Monitoring Well BG5UF
Boring BG5UF (BGMW05UF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #5*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1440 on 1-12-95*	TOC Elevation: *feet msl*
Completed at *1540 on 1-12-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *53.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *43.0 to 53.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silty loam with roots.	
			1	75	BG			Silt, clayey, yellowish brown to yellowish gray, with orange brown mottling, moist, plastic.	
5									
10			2	75	BG				
15									
							ML	Silt, clayey, medium gray, massive, moist.	
20			3	125	BG				
								Silt, clayey, medium gray to blue gray with orange brown mottling.	
25									
30									
			4	105	BG			Silt, clayey, light brown gray to orangish brown, mottled, gravel.	
35									
							GP	Sand, silty and clayey, moderate brown to brownish orange, trace gravel.	
40									

WELL DIAGRAM



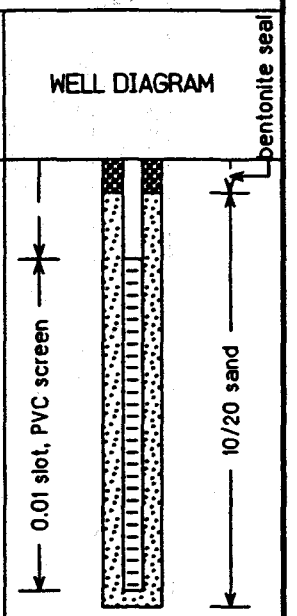
EnSafe/Allen & Hoshall

Monitoring Well BG5UF
Boring BG5UF (BGMW05UF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #5*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1440 on 1-12-95*	TOC Elevation: *feet msl*
Completed at *1540 on 1-12-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *53.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *43.0 to 53.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			5	108	BG		GP	Sand, silty and gravelly, brownish gray to orangish brown, moist.	
50								Sand, fine to coarse grained with gravel, yellowish gray to grayish orange.	
55			6	100	BG			Log information taken from the boring for the lower fluvial at BG-5.	
60									
65									
70									
75									
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall

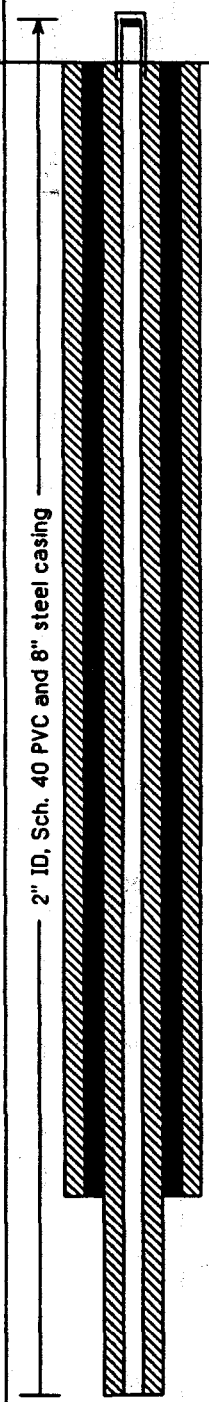
Monitoring Well BG5LF

(BGMW05LF)

Project: *NAS Memphis*	Location: *Millington, TN. Background Site #5*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1440 on 1-12-95*	TOC Elevation: *feet msl*
Completed at *1540 on 1-12-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *86.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *66.0 to 76.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silty loam with roots.	
			1	75	BG			Silt, clayey, yellowish brown to yellowish gray, with orange brown mottling, moist, plastic.	
5									
10			2	75	BG				
15							ML	Silt, clayey, medium gray, massive, moist.	
20			3	125	BG				
								Silt, clayey, medium gray to blue gray with orange brown mottling.	
25									
30			4	105	BG			Silt, clayey, light brown gray to orangish brown, mottled, gravel.	
35									
							GP	Sand, silty and clayey, moderate brown to brownish orange, trace gravel.	
40									

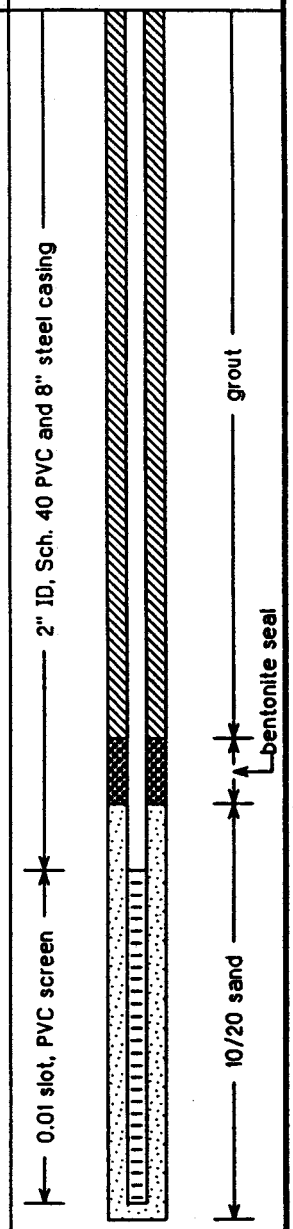
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well BG5LF (BGMW05LF)
Project: *NAS Memphis*	Location: *Millington, TN. Background Site #5*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1440 on 1-12-95*	TOC Elevation: *feet msl*
Completed at *1540 on 1-12-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *86.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *66.0 to 76.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	108	BG			Sand, silty and gravelly, brownish gray to orangish brown, moist.	
45									
								Sand, fine to coarse grained with gravel, yellowish gray to grayish orange.	
50									
55			6	100	BG				
							GP		
60									
65			7	90	BG				
70									
75			8	110	BG				
							SC	Sand, very fine, silty, yellowish gray to yellowish orange, occassional clay casts, very wet.	
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well BG5LF (BGMW05LF)
Project: *NAS Memphis*	Location: *Millington, TN. Background Site #5*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1440 on 1-12-95*	TOC Elevation: *feet msl*
Completed at *1540 on 1-12-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *86.0 feet*
Geologist: *Jack Carmichael and William Parks*	Well Screen: *66.0 to 76.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SC			
85			9	90	BG			End of boring at 86'.		
90										
95										
100										
105										
110										
115										
120										

EnSafe/Allen & Hoshall

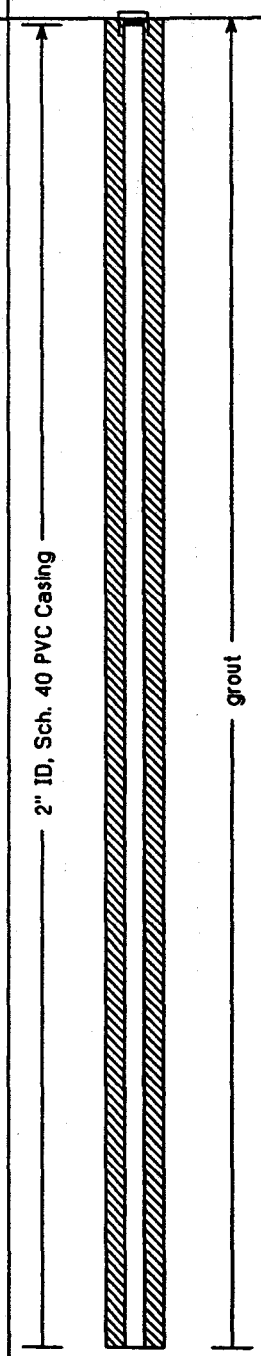
Monitoring Well OBGG06UC

(BGMW06UC)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #6*
Project No.: *0106-08420*	Surface Elevation: *320.25 feet msl*
Started at *0850 on 2-29-96*	TOC Elevation: *320.02 feet msl*
Completed at *1010 on 2-29-96*	Depth to Groundwater: *36.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *283.56 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *66.0 feet*
Geologist: *J.C., W.P., D.L.*	Well Screen: *52 to 62 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	66	BG		ML	Silt, mottled light brown and pale yellowish-brown, roots 0' to 5', dry to slightly moist	
5								Silt with a trace of clay, moderate yellowish-brown to dark yellowish- orange, fairly uniform, dry	
10			2	100	BG			With iron/manganese inclusions and pale yellowish-brown striations from 10' to 13', slightly moist	
15								Silt with a trace of clay, moderate yellowish-brown, iron/manganese staining present but less than above	
								Top of Fluvial Deposits estimated at 16'.	303.2
20			3	110	BG		SM	Silty sand with a trace of gravel, moderate yellowish-brown to dark yellowish orange, gravel up to 1" diameter, moist	299.2
							SC SM	Gravelly sand with silt and clay, dark yellowish-orange stained moderate reddish-brown, dense	297.2
25							SW	Gravelly sand, dark yellowish-orange with light brownish-gray sand seams, gravel up to 3" diameter, moist, loose	
									291.2
30			4	110	BG		SP SM	(29-44') Cockfield Formation: sandy, very fine (see descriptions below).	
35								(25-36') Silty sand, very fine-grained, dark yellowish- orange mottled with small amounts of light olive gray and light brown material, very clayey from 28' to 31'.	
								(36-44') Sand, very fine, dark yellowish-orange mottled with light olive gray, very wet	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

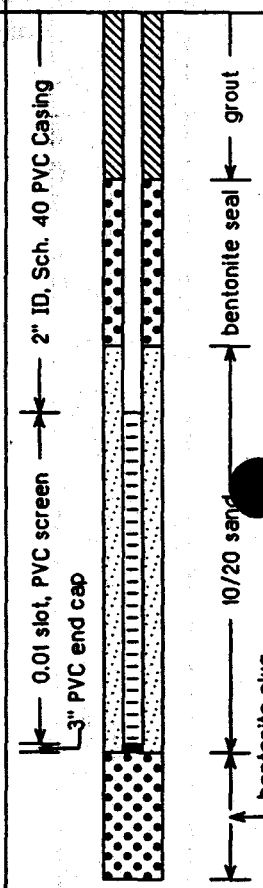
Monitoring Well OBGG06UC

(BGMW06UC)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #6*
Project No.: *0106-08420*	Surface Elevation: *320.25 feet msl*
Started at *0850 on 2-29-96*	TOC Elevation: *320.02 feet msl*
Completed at *1010 on 2-29-96*	Depth to Groundwater: *36.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *283.56 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *66.0 feet*
Geologist: *J.C., W.P., D.L.*	Well Screen: *52 to 62 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	95	BG		SP SM		
45							SM	(44-48.5') Silty sand, very fine, dusky yellowish-brown to dark yellowish-brown, contains some lignitic material	276.2
50			6	110	BG		CL	Clay, slightly sandy and micaceous, olive gray, with some lignitic material. More sandy near 48.5' than below.	271.7
55							SP	(52-63') Sand, very fine to fine, light olive gray to olive gray with traces of lignitic material, slightly micaceous, wet	268.2
60			7	110	BG			Slightly clayey from 59' to 62'	
65							CL ML SP	(63-64') Sandy silt and clay, dusky yellowish-brown mottled with dark yellowish-brown, contains lignitic material	257.2 / 256.2
								(64-66') Sand, very fine, light olive gray to olive gray, micaceous, contains lignitic material, with dark yellowish-brown silt near top	254.2
70								Soil boring terminated at 66'.	
75									
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall

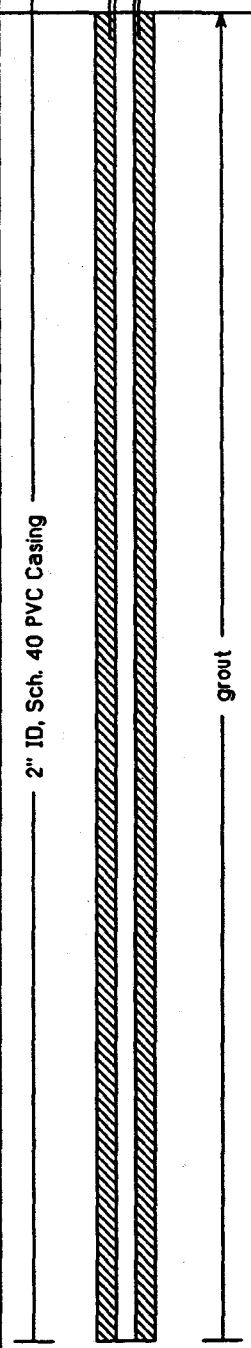
Monitoring Well OBGG07UC

(BGMW07UC)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #7*
Project No.: *0106-08420*	Surface Elevation: *321.08 feet msl*
Started at *1306 on 3-2-96*	TOC Elevation: *323.23 feet msl*
Completed at *1435 on 3-2-96*	Depth to Groundwater: *37.05 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *286.18 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *86.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-2') Soil, grass, and roots.	319.1
			1	66	BG		ML	(2-23') Silt and clayey silt (see descriptions below). (2-6') Silt, moderate yellowish-brown sparsely mottled with light olive gray, some iron-manganese nodules. (6-16') Silt, moderate yellowish-brown.	
5									
10			2	70	BG				
15								Very clayey and moist from 14' to 16'.	
20			3	80	BG			(16-23') Silt, very clayey, moderate yellowish-brown, very wet at 18' with iron-manganese nodules.	
25							ML	(23-27') Silt, moderate yellowish-brown mottled with light olive gray and dark yellowish-orange, containing many large iron-manganese nodules, dry.	298.1

WELL DIAGRAM



EnSafe/Allen & Hoshall

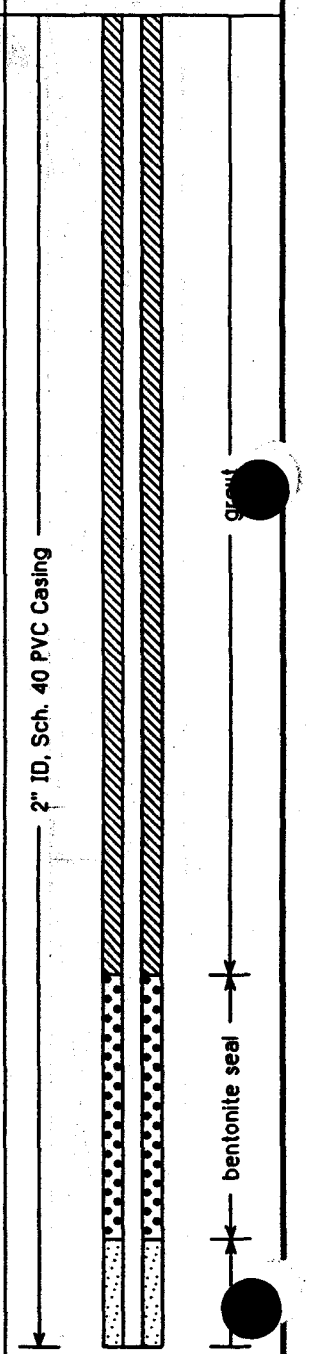
Monitoring Well OBGG07UC

(BGMW07UC)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #7*
Project No.: *0106-08420*	Surface Elevation: *321.08 feet msl*
Started at *1306 on 3-2-96*	TOC Elevation: *323.23 feet msl*
Completed at *1435 on 3-2-96*	Depth to Groundwater: *37.05 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *286.18 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *86.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X						ML		
									294.1
							ML	(27-34') Fluvial Deposits (see descriptions below). (27-29.5') Silt, moderate yellowish-brown, locally stained dark yellowish-orange contains gravel up to 1" in longest dimension, contains some sand near 29.5'.	291.6
30			4	125	BG		SM GP	(29.5-35') Silty fine-grained sand and gravel up to 2" in longest dimension, dark yellowish-orange mottled with light brown, light olive gray, and locally with moderate reddish brown, contains some iron concretions. Top of Cockfield Formation estimated at 34'.	
35									286.1
							SM	(35-45') Sand, fine and silty (see descriptions below). (35-36') Silty sand, fine-grained, dark yellowish-orange, mottled with light brown and light olive gray, containing splotches of moderate reddish-brown, wet.	
40			5	110	BG			(36-45') Sand, fine, silty, dark yellowish-orange mottled with light brown and light olive gray to 40', mottled with only light olive gray from 40-42', wet.	
45									276.1
							SP	(45-48') Sand, fine-grained, very light gray, mottled with dark yellowish-orange at 45', micaceous, wet.	
									273.1
							SP	(48-60') Sand, fine-grained, very light gray mottled with dark yellowish-orange, slightly micaceous, wet.	
50									

WELL DIAGRAM



EnSafe/Allen & Hoshall

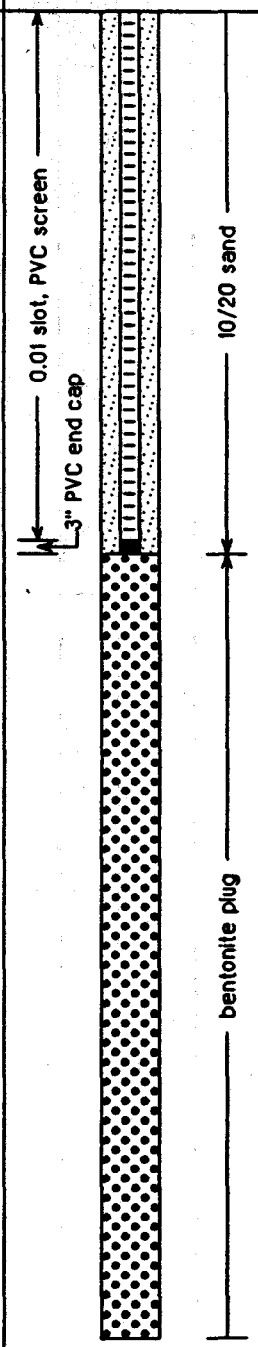
Monitoring Well OBGG07UC

(BGMW07UC)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #7*
Project No.: *0106-08420*	Surface Elevation: *321.08 feet msl*
Started at *1306 on 3-2-96*	TOC Elevation: *323.23 feet msl*
Completed at *1435 on 3-2-96*	Depth to Groundwater: *37.05 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *286.18 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *86.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								3" clay seam near 50', very wet below 50'.	
			6	100	BG				
55							SP		
								Less yellowish-orange mottling from 58' to 60'	
								Pale red material near 59'	
60									261.1
			7	100	BG		SM	(60-63.5') Silty sand, fine-grained, dark yellowish-orange mottled with very light gray, contains dark yellowish-orange and moderate reddish-brown iron staining, wet.	
									257.6
							SP	(63.5-65') Sand, fine-grained, very light gray, wet.	
65									258.1
							SM	(65-72') Slightly silty sand, fine-grained, very light gray mottled with dark yellowish-orange, contains some dark yellowish-orange and moderate reddish-brown iron staining, wet.	
70			8	70	BG				
									249.1
							SP	(72-73.5') Sand, fine-grained, very light gray, wet.	
									247.6
							SP	(73.5-76') Sand, fine, very light gray mottled with dark yellowish- orange, with dark yellowish-orange and moderate reddish-brown staining, contains iron concretions, wet.	
75									

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well OBGG07UC

(BGMW07UC)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #7*
Project No.: *0106-08420*	Surface Elevation: *321.08 feet msl*
Started at *1306 on 3-2-96*	TOC Elevation: *323.23 feet msl*
Completed at *1435 on 3-2-96*	Depth to Groundwater: *37.05 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *286.18 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *86.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SP		245.1	
								No sample recovered from 76' to 86'		
80			9	0				No sample recovered from 76' to 86'		bentonite plug
85										
								Soil boring terminated at 86'.		
90										
95										
100										

EnSafe/Allen & Hoshall

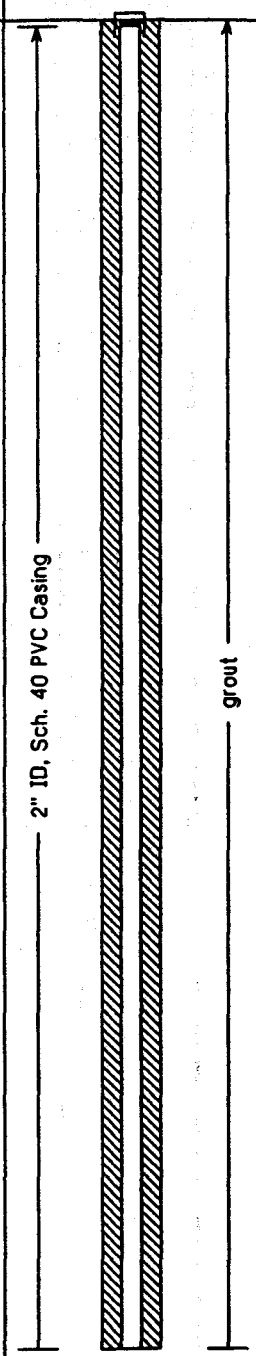
Monitoring Well 0BGG08UF

(BGMW08UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #8*
Project No.: *0106-08420*	Surface Elevation: *299.88 feet msl*
Started at *0750 on 3-3-96*	TOC Elevation: *299.68 feet msl*
Completed at *1100 on 3-17-96*	Depth to Groundwater: *45.82 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.86 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-2') Soil, grass, and roots.	297.9
			1	75	BG			(2-6') Silt, moderate yellowish-brown mottled with light olive gray, traces of iron-manganese nodules.	
5								Moist from 4' to 6'.	
								(6-16') Clayey silt, moderate yellowish-brown sparsely mottled with light olive gray, wet from 6' to 13'.	
10			2	75	BG				
								Moist from 13' to 16'.	
15									
20							ML	Clayey silt with a trace of fine sand, yellowish-orange mottled with brown silt.	
								Silt, with clay and sand, dark yellowish orange mottled with very light gray silt, micaceous.	
25			3	80	BG				
30									
35								Silt, with clay and sand, yellowish-brown to very light gray with some dark yellowish-orange mottling.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

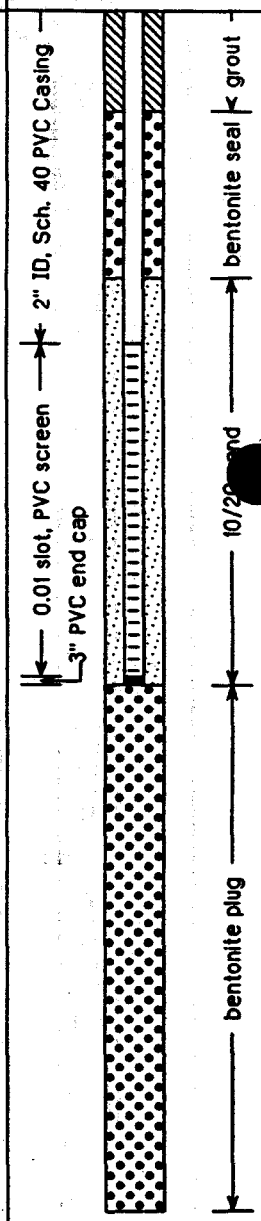
Monitoring Well OBGG08UF

(BGMW08UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #8*
Project No.: *0106-08420*	Surface Elevation: *299.88 feet msl*
Started at *0750 on 3-3-96*	TOC Elevation: *299.68 feet msl*
Completed at *1100 on 3-17-96*	Depth to Groundwater: *45.82 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.86 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML		
45			4	110	BG		SC	Clayey sand, fine to medium-grained, yellowish brown, micaceous, wet. Top of Fluvial Deposits estimated at 46'.	255.9
50							SW	Sand, fine to medium grained, yellowish brown to orangish-gray, with a few clay seams up to 3" thick from 50 to 52'. Sand, fine to coarse-grained, yellowish-brown to orangish-gray, with gravel up to 0.5" in longest dimension. Becoming reddish-brown to dusky yellow with gravel up to 0.5" in longest dimension. Sand, fine to very coarse-grained, with abundant gravel up to 1" in longest dimension. With minor clay lenses up to 3" thick from 58' to 63'. Sand, fine to very coarse-grained, reddish-brown to dusky yellow with gravel up to 1" in longest dimension.	249.9
55									
60									
65			5	95	BG				
70							SW GW	Sand, medium to very coarse-grained, and gravel up to 0.5" in longest dimension, dusky yellow to yellowish-gray.	231.9
75									223.9
80								Soil boring terminated at 76'. Attempted to sample the 76' to 86' interval; however, no sample could be retrieved. Cockfield Formation not encountered.	

WELL DIAGRAM



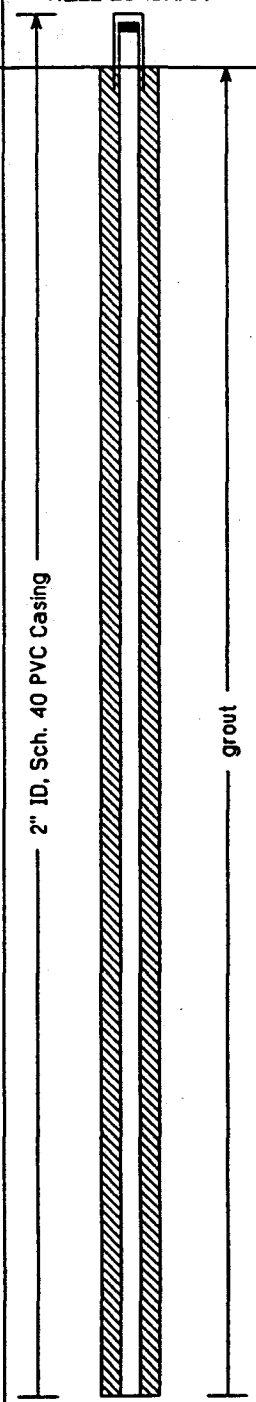
EnSafe/Allen & Hoshall

Monitoring Well OBGG09MF
(B6MW09MF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #9*
Project No.: *0106-08420*	Surface Elevation: *312.70 feet msl*
Started at *1230 on 4-3-96*	TOC Elevation: *314.82 feet msl*
Completed at *1720 on 4-3-96*	Depth to Groundwater: *55.6 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger with 5' Flights*	Groundwater Elevation: *259.22 feet msl*
Drilling Company: *Alliance Environmental/Midwest Engineering*	Total Depth: *72.0 feet*
Geologist: *R. Smith*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-1') Soil, roots, gravel, and organic material.	311.7
5							ML	(1-8') Silt, moderate yellowish-brown, mottled with olive gray from 5-6', with organic material and roots near 5'.	304.7
10, 15							CL	(8-20') Silty clay, moderate yellowish-brown, moist to wet. Becoming very silty and less moist near 20'.	292.7
20, 25							ML	(20-30') Silt (see descriptions below). (20-26') Silt, moderate yellowish-brown, mottled with dark yellowish- orange and mottled with very light gray from 23' to 26', contains iron-manganese nodules and sparse iron concretions, hard and dry. (26-30') Silt, moderate yellowish-brown, sparsely mottled with light olive gray, clayey in some areas, and contains iron-manganese nodules.	
30							ML CL		282.7

WELL DIAGRAM



EnSafe/Allen & Hoshall

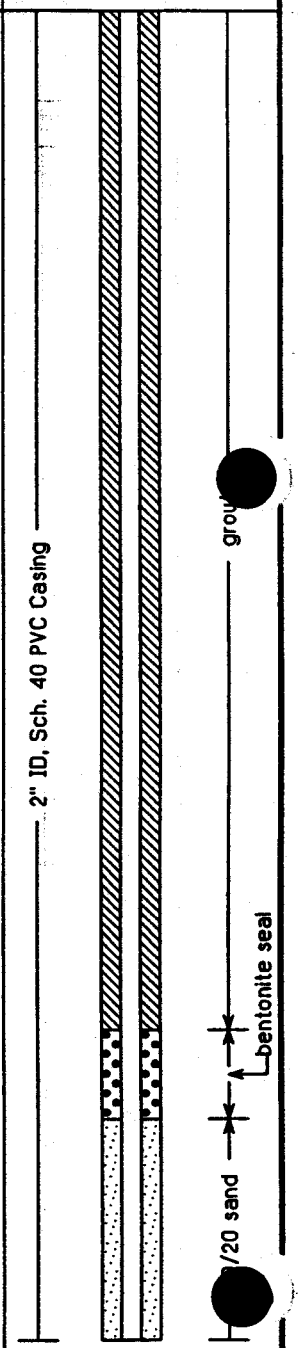
Monitoring Well OBGG09MF

(BGMW09MF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #9*
Project No.: *0106-08420*	Surface Elevation: *312.70 feet msl*
Started at *1230 on 4-3-96*	TOC Elevation: *314.82 feet msl*
Completed at *1720 on 4-3-96*	Depth to Groundwater: *55.6 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger with 5' Flights*	Groundwater Elevation: *259.22 feet msl*
Drilling Company: *Alliance Environmental/Midwest Engineering*	Total Depth: *72.0 feet*
Geologist: *R. Smith*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML CL	(30-35') Silt and clay, dark yellowish-orange mottled with light brown, very light gray, and some moderate reddish-brown, very hard, containing moderate reddish-brown iron concretions. Contains some very fine-grained sand near 35'.	282.7
35							SC	(35-43') Sand, silt, and clay (see descriptions below). (35-36') Clayey sand with silt, very fine-grained, moderate yellow mottled with dark yellowish-orange, light brown, and very light gray. (36-43') Fine-grained sand with clay and silt, dark yellowish-orange with light brown, very light gray, and moderate reddish-brown mottling, hard. Contains some iron concretions.	277.7
40								Top of Fluvial Deposits estimated at 42'.	269.7
							SP	(43-44') Sand, fine-grained, dark yellowish-orange to light brown, wet.	268.7
							SC SM	(44-45') Sand, very fine-grained, clay, and silt (same color as 35-43').	267.7
45							SW GW	(45-50.5') Sand and gravel (see descriptions below). (45-46') Sand and gravel; sand is fine to very coarse-grained, gravel is small and composed of quartz and chert; dark yellowish-orange, wet.	
50							SC	(46-50.5') Silty sand and gravel; sand is fine to very coarse-grained, grayish-orange to dark yellowish-orange mottled with light olive gray; gravel is up to .75" in longest dimension, wet.	262.2
							SM GW	(50.5-51.5') Sand, very fine-grained, and clay, pale red mottled with very light gray and dark yellowish-orange material.	261.2
55							SM	(51.5-56') Silty sand, fine to coarse-grained, dark yellowish-orange to light brown and gravel up to 2" in longest dimension, gravel is composed mostly of chert.	256.7
							CL	(56-56.5') Silty sand, fine-grained, dark yellowish-orange, becoming cemented.	256.2
60									

WELL DIAGRAM



EnSafe/Allen & Hoshall

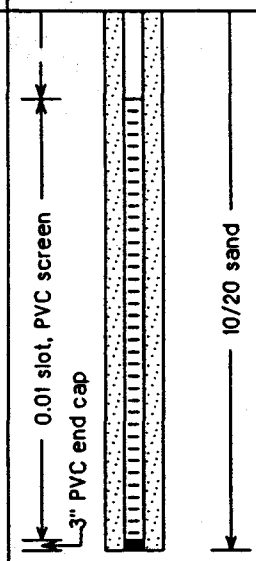
Monitoring Well 0BGG09MF

(BGMW09MF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #9*
Project No.: *0106-08420*	Surface Elevation: *312.70 feet msl*
Started at *1230 on 4-3-96*	TOC Elevation: *314.82 feet msl*
Completed at *1720 on 4-3-96*	Depth to Groundwater: *55.6 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger with 5' Flights*	Groundwater Elevation: *259.22 feet msl*
Drilling Company: *Alliance Environmental/Midwest Engineering*	Total Depth: *72.0 feet*
Geologist: *R. Smith*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							CL	(56.5-62') Clay, yellowish-gray mottled with dark yellowish-orange, hard.	250.7
							SW	(62-63') Sand, fine to coarse-grained, dark yellowish-orange to light brown, with gravel up to 0.5" in longest dimension, wet.	249.7
65							SW GW	(63-66') Sand, fine to coarse-grained, very pale orange to grayish- orange, and gravel up to 1" in longest dimension, gravel is composed mainly of chert, wet.	246.7
70							SW	(66-72') From 66' to 69', sand, fine to very coarse-grained, yellowish-gray to grayish-orange, with scattered gravel, wet. From 69' to 70', has iron-stained zones and black iron concretions. Contains clayey zones from 71' to 72'.	240.7
75								Note: Soil boring terminated at 72' and monitoring well installed in hollow-stem auger annulus. No samples were collected for lithologic description. Lithology based on continuous sampling of the adjacent borehole for the installation of 0BGG09UF (refer to previous log).	
80									
85									
90									

WELL DIAGRAM



EnSafe/Allen & Hoshall

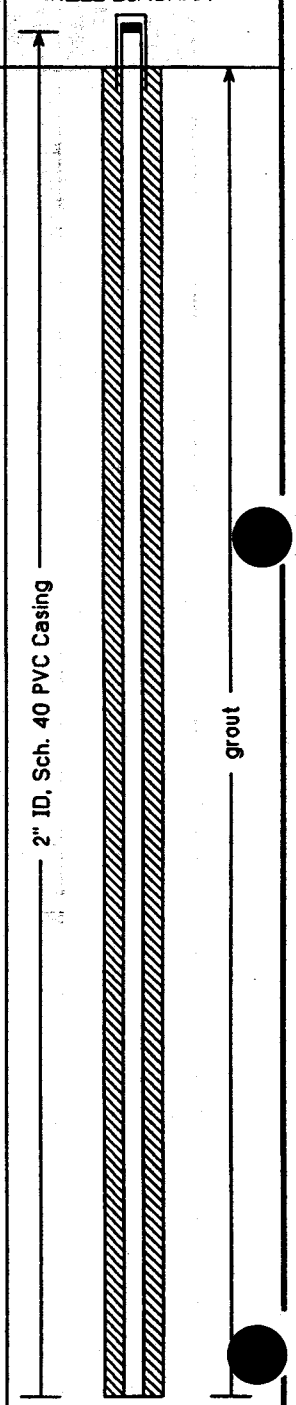
Monitoring Well 0BGG09UF

(BGMW09UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #9*
Project No.: *0106-08420*	Surface Elevation: *312.39 feet msl*
Started at *1210 on 3-14-96*	TOC Elevation: *315.20 feet msl*
Completed at *1405 on 3-14-96*	Depth to Groundwater: *dry feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *dry feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-1') Soil, roots, gravel, and organic material.	311.4
			1	92	BG		ML	(1-8') Silt, moderate yellowish-brown, mottled with olive gray from 5-6', with organic material and roots near 5'.	304.4
5									
10			2	60	BG		CL	(8-20') Silty clay, moderate yellowish-brown, moist to wet. Becoming very silty and less moist near 20'	292.4
15									
20			3	90	BG		ML	(20-30') Silt (see descriptions below). (20-26') Silt, moderate yellowish-brown, mottled with dark yellowish- orange and mottled with very light gray from 23' to 26', contains iron-manganese nodules and sparse iron concretions, hard and dry. sparsely mottled with light olive gray and (26-30') Silt, moderate yellowish-brown, sparsely mottled with light olive gray, clayey in some areas, and contains iron-manganese nodules.	
25									
30							ML CL		282.4

WELL DIAGRAM



EnSafe/Allen & Hoshall

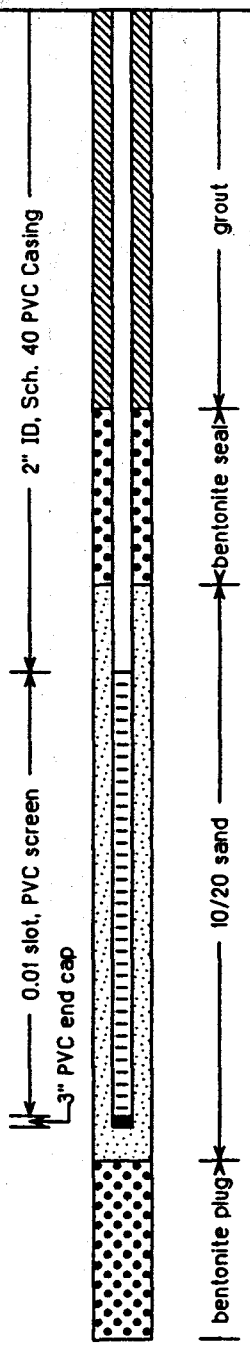
Monitoring Well 0BGG09UF

(BGMW09UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #9*
Project No.: *0106-08420*	Surface Elevation: *312.39 feet msl*
Started at *1210 on 3-14-96*	TOC Elevation: *315.20 feet msl*
Completed at *1405 on 3-14-96*	Depth to Groundwater: *dry feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *dry feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			4	130	BG		ML CL	(30-35') Silt and clay, dark yellowish-orange mottled with light brown, very light gray, and some moderate reddish-brown, very hard, containing moderate reddish-brown iron concretions. Contains some very fine-grained sand near 35'.	282.4
35							SC	(35-43') Sand, silt, and clay (see descriptions below). (35-36') Clayey sand with silt, very fine-grained, moderate yellow mottled with dark yellowish-orange, light brown, and very light gray material.	277.4
40			5	100	BG			(36-43') Fine-grained sand with clay and silt, dark yellowish-orange with light brown, very light gray, and moderate reddish-brown mottling, hard. Contains some iron concretions. Top of Fluvial Deposits estimated at 42'.	269.4
							SP	(43-44') Sand, fine-grained, dark yellowish-orange to light brown, wet.	268.4
							SP CL	(44-45') Sand, very fine-grained, clay, and silt (same color as 35-43').	267.4
45							SW GW	(45-50.5') Sand and gravel (see descriptions below). (45-46') Sand and gravel; sand is fine to very coarse-grained, gravel is small quartz and chert; dark yellowish orange, wet.	
50			6	85	BG		SC	(46-50.5') Silty sand and gravel; sand is fine to very coarse-grained, grayish-orange to dark yellowish-orange mottled with light olive gray; gravel is up to .75" in longest dimension, wet.	261.9
							SM GW	(50.5-51.5') Sand, very fine-grained, and clay, pale red mottled with very light gray and dark yellowish-orange.	260.9
55							SM	(51.5-56') Silty sand, fine to coarse-grained, dark yellowish orange to light brown,and gravel up to 2" in longest dimension, gravel is composed mostly of chert.	256.4
							CL	(56-56.5') Silty sand, fine-grained, dark yellowish-orange, becoming cemented.	255.9
60									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well OBGG09UF (BGMW09UF)
Project: *NSA Memphis*	Location: *Millington, TN. Background Location #9*
Project No.: *0106-08420*	Surface Elevation: *312.39 feet msl*
Started at *1210 on 3-14-96*	TOC Elevation: *315.20 feet msl*
Completed at *1405 on 3-14-96*	Depth to Groundwater: *dry feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *dry feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
			7	110	BG		CL	(56.5-62') Clay, yellowish-gray mottled with dark yellowish-orange material, hard.	250.4	
							SW	(62-63') Sand, fine to coarse-grained, dark yellowish-orange to light brown, with gravel up to 0.5" in longest dimension, wet.	249.4	
65							SW/GW	(63-66') Sand, fine to coarse-grained, very pale orange to grayish- orange, and gravel up to 1" in longest dimension, gravel is composed mainly of chert, wet.	246.4	
70			8	110	BG		SW	(66-73.5') From 66' to 69', sand, fine to very coarse-grained, yellowish-gray to grayish-orange, with scattered gravel, wet. From 69' to 70', has iron-stained zones and black iron concretions. Contains clayey zones from 71' to 73.5', and iron staining near 73.5'.	238.9	bentonite plug
75							CL	(73.5-74.5') Clay, pale red mottled with dark yellowish-orange and very light gray material, contains iron concretions.	237.9	
80			9	80	BG		SP	(74.5-85') Sand, fine (see descriptions below). (74.5-76') Sand, fine-grained, yellowish-gray locally stained dark yellowish-orange, becoming wet. (76-85') Sand, fine, yellowish-gray to grayish-orange, wet.		
85							SW/GW	(85-94') Sand and gravel (see descriptions below). (85-86') Sand, fine, and scattered gravel, grayish-orange, wet.	227.4	
90										

EnSafe/Allen & Hoshall	Monitoring Well 0BGG09UF (BGMW09UF)
Project: *NSA Memphis*	Location: *Millington, TN. Background Location #9*
Project No.: *0106-08420*	Surface Elevation: *312.39 feet msl*
Started at *1210 on 3-14-96*	TOC Elevation: *315.20 feet msl*
Completed at *1405 on 3-14-96*	Depth to Groundwater: *dry feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *dry feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
			10	130	BG		SW GW	(86-94') Sand, fine- to coarse-grained, and gravel up to 2.5" in longest dimension (mostly chert), grayish-orange to dark yellowish-orange, wet. Contains a very light gray clay seam with lignitic material at 86.5'.		bentonite plug
							SC	Very large gravel near 91.5'.	218.4	
95							SC	Dark yellowish orange with one large iron concretion from 93.5-94'.	217.9	
								(94-94.5') Cockfield Formation: clayey sand, very fine-grained, stained dark yellowish-orange mottled with sparse light olive-gray	216.4	
100								(94.5-96') Sand, very fine, clayey, dusky yellowish-brown to olive black with light olive gray very fine-grained sandy seams.		
								Soil boring terminated at 96'.		
105										
110										
115										
120										

EnSafe/Allen & Hoshall

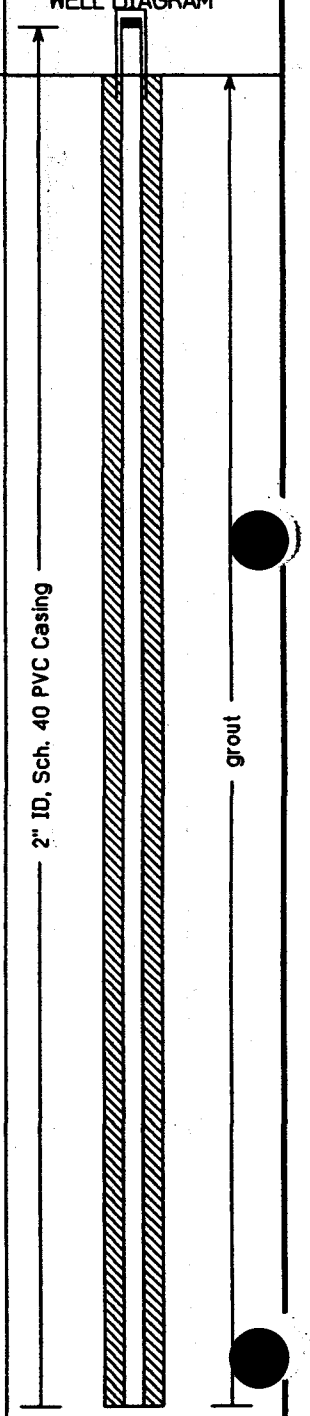
Monitoring Well OBGG10UF

(BGMW10UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #10*
Project No.: *0106-08420*	Surface Elevation: *273.58 feet msl*
Started at *0823 on 3-1-96*	TOC Elevation: *275.50 feet msl*
Completed at *1024 on 3-1-96*	Depth to Groundwater: *30.58 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *244.92 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *56 to 66 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-3') Soil, grass, and roots.	
			1	75	BG				270.6
							ML	(3-4') Silt, moderate yellowish-brown, mottled with light olive gray.	269.6
5							CL ML	(4-6') Silty clay, moderate yellowish-brown mottled with light olive gray, hard.	267.6
								(6-16') Clayey silt, moderate yellowish-brown mottled with light olive gray and sparse dark yellowish-orange, contains traces of organic material, very moist.	
10			2	60	BG		ML		
15									257.6
								(16-28.5') Silt (see descriptions below).	
								(16-26') Clayey silt, olive gray with sparse moderate yellowish-brown material, very moist from 16' to 21', very dry near 26', with sparse iron-manganese nodules.	
20			3	65	BG				
							ML		
25								(26-28.5') Silt, light gray mottled with sparse moderate yellowish- brown, wet and clayey from 26' to 27', dry below.	
									245.1
30							ML		

WELL DIAGRAM



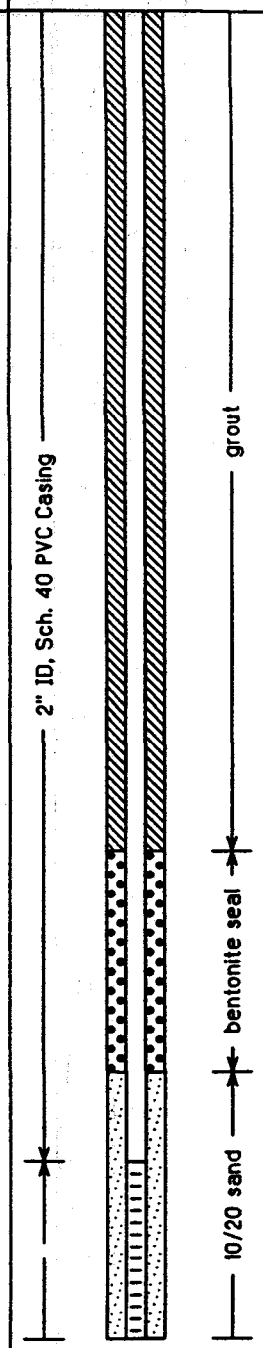
EnSafe/Allen & Hoshall

Monitoring Well OBGG10UF
(BGMW10UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #10*
Project No.: *0106-08420*	Surface Elevation: *273.58 feet msl*
Started at *0823 on 3-1-96*	TOC Elevation: *275.50 feet msl*
Completed at *1024 on 3-1-96*	Depth to Groundwater: *30.58 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *244.92 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *56 to 66 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
35			4	105	BG		ML	(28.5-37') Silt, moderate yellowish-brown mottled with light gray to light olive gray, with dusky yellow material from 28.5'to 31', contains iron-manganese nodules, predominately near 36'.	
									238.6
40			5	120	BG		ML	(37-43') Sandy silt with scattered gravel, dark yellowish-orange mottled with some light olive-gray, moist. Top of Fluvial Deposits estimated at 41'.	
									230.6
45							SW GM	(43-52') Silty sand, medium to very coarse-grained, and gravel, dark yellowish-orange mottled with sparse light olive gray, wet. Less gravel from 45' to 46'. Gravel looks weathered from 46-52'.	
50			6	100	BG			Clay seam near 50'.	
									221.6
55							SW	(52-62') Sand (see descriptions below). (52-56') Sand, fine to medium-grained, dark yellowish-orange, with scattered rounded to angular gravel, wet. (56-62') Sand, fine to very coarse-grained, dark yellowish-orange to grayish-orange, with scattered angular to rounded gravel up to 1.5" in longest dimension, wet.	
60									

WELL DIAGRAM



EnSafe/Allen & Hoshall

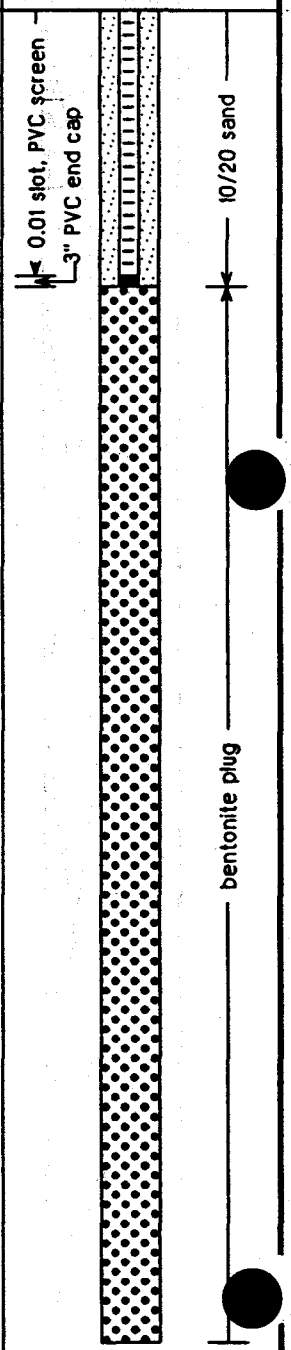
Monitoring Well OBGG10UF

(BGMW10UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #10*
Project No.: *0106-08420*	Surface Elevation: *273.58 feet msl*
Started at *0823 on 3-1-96*	TOC Elevation: *275.50 feet msl*
Completed at *1024 on 3-1-96*	Depth to Groundwater: *30.58 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *244.92 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *56 to 66 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			7	110	BG		SW		
							SW/GW	(62-64') Sand, fine to very coarse-grained, and gravel up to 2.5" in longest dimension, dark yellowish-orange, wet	211.6
							SW	(64-69') Sand, medium to very coarse-grained, dark yellowish-orange to moderate yellowish-brown, with scattered gravel, wet.	209.6
65									
							SW/GW	(69-70') Sand, medium to very coarse-grained, and gravel up to 1.5" in longest dimension, dark yellowish-orange to moderate yellowish- brown, wet.	204.6
70			8	105	BG		SW	(70-78') Sand, medium to very coarse-grained, with scattered gravel, dark yellowish-orange to moderate yellowish-brown, wet.	203.6
75									
							SW/GW	(78-79') Sand, medium to very coarse-grained, and rounded to angular gravel up to 2" in longest dimension, dark yellowish-orange to moderate yellowish-brown, wet.	195.6
80			9	95	BG		SW	(79-82') Sand, medium to very coarse-grained, with scattered gravel, dark yellowish-orange to moderate yellowish-brown, wet	194.6
							SW/GW	(82-82.5') Sand, medium to very coarse-grained, and gravel up to 3 1/2" in longest dimension, dark yellowish-orange to moderate yellowish-brown, wet.	191.6
85							SM	(85.5-91.5') Silty sand, fine-grained, dark yellowish-orange mottled with light olive gray from 85.5 to 86', with gravel up to 3" in longest dimension at 91.5', wet.	188.1
90									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well OBGG10UF (BGMW10UF)
Project: *NSA Memphis*	Location: *Millington, TN. Background Location #10*
Project No.: *0106-08420*	Surface Elevation: *273.58 feet msl*
Started at *0823 on 3-1-96*	TOC Elevation: *275.50 feet msl*
Completed at *1024 on 3-1-96*	Depth to Groundwater: *30.58 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *244.92 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *56 to 66 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
			10	100	BG		SM		181.6	bentonite plug
							CL	(92-94') Cockfield Formation: Sandy clay, olive gray.	179.6	
95							SC	(94-96') Clayey sand, fine-grained, olive gray.	177.6	
								Soil boring terminated at 96'.		
100										
105										
110										
115										
120										

EnSafe/Allen & Hoshall

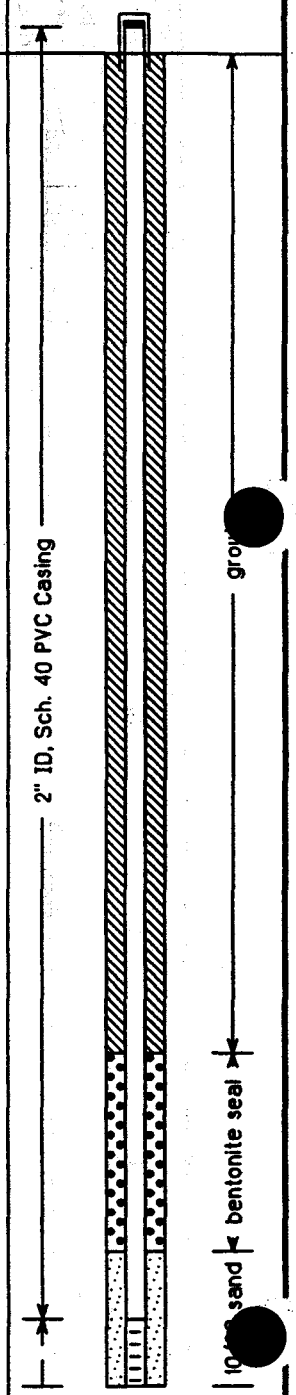
Monitoring Well OBGG11UA

(BGMW11UA)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #11*
Project No.: *0106-08420*	Surface Elevation: *261.81 feet msl*
Started at *0800 on 3-18-96*	TOC Elevation: *263.84 feet msl*
Completed at *1300 on 3-18-96*	Depth to Groundwater: *16.42 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *247.42 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							GP GM	Gravel and silt (fill).	259.8
			1	100	BG			Brown silt with some dark yellowish-orange staining and organic flecks	
5								Silt, yellowish brown mottled with yellowish gray, moist.	
10			2	90	BG			Silt, olive gray to greenish-gray, wet.	
15								Silt, brownish-gray to greenish-gray, wet.	
								Large wood fragment.	
20							ML		
								With sand streaks between 22' and 26', wet.	
25			3	105	BG				
30								With sand streaks between 30' and 36', wet.	
35								(36-69') Fluvial Deposits (see descriptions below).	224.8
							SW GW	Silt and sand, olive gray.	
40								Sand and gravel, reddish-brown to orangish-yellow.	

WELL DIAGRAM



EnSafe/Allen & Hoshall

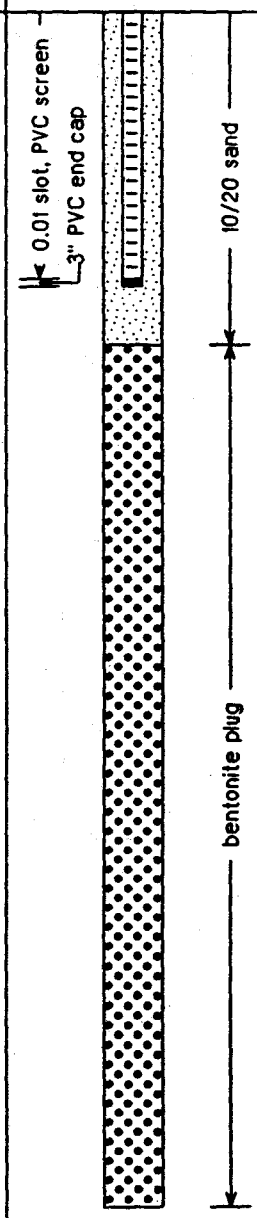
Monitoring Well OBGG11UA

(BGMW11UA)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #11*
Project No.: *0106-08420*	Surface Elevation: *261.81 feet msl*
Started at *0800 on 3-18-96*	TOC Elevation: *263.84 feet msl*
Completed at *1300 on 3-18-96*	Depth to Groundwater: *16.42 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *247.42 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW GW		217.8
45			4	100	BG		SW	Sand, coarse-grained, with some gravel, grayish-yellow to dusky yellow	209.8
50									
55							GW GC	Gravel with some sand and clay in the matrix, grayish-yellow to 54' turning to reddish-brown at 56'.	205.8
							SW GW	Sand and gravel, reddish-brown to yellowish-orange.	202.8
60			5	100	BG		GW	Gravel lense between 59' and 61'.	200.8
65							SW GW	Predominantly sand with several layers of iron-cemented gravel 1" to 2" thick, gravel is up to 2" in longest dimension.	192.8
70			6	120	BG		SP CL	Cockfield Formation: sand, fine-grained and olive-gray, with some seams of brown clay and organic material.	185.8
75								Soil boring terminated at 76'.	
80									

WELL DIAGRAM



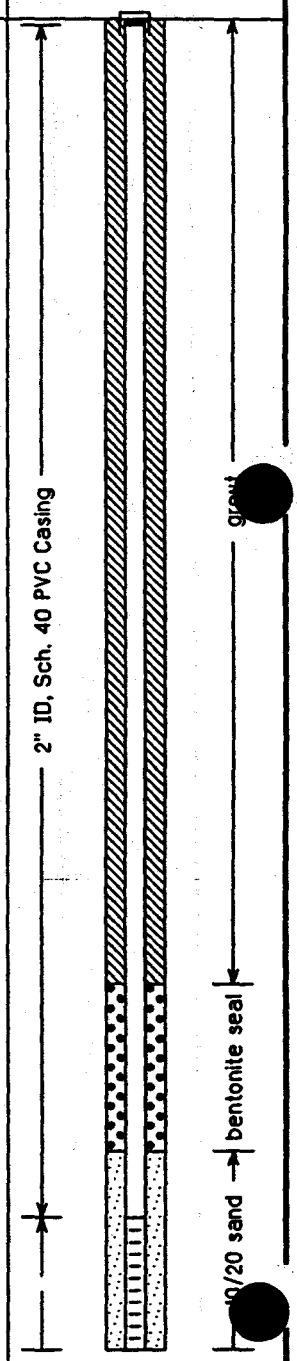
EnSafe/Allen & Hoshall

Monitoring Well OBGG12UF
(BGMW12UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #12*
Project No.: *0106-08420*	Surface Elevation: *268.90 feet msl*
Started at *1415 on 2-18-96*	TOC Elevation: *268.71 feet msl*
Completed at *1530 on 2-18-96*	Depth to Groundwater: *9.09 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *259.62 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *66.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SP SC	Asphalt, sand, and clay (fill).	
			1	100	BG		CL ML	Clay and silt, gray.	265.9
5									262.9
10			2	90	BG		ML	Silt, yellowish-brown to yellowish-gray with organic specks and iron staining, moist. Color change to greenish-gray to olive gray, some snail shells.	
15									252.9
							CL	Clay with some silt, brownish-gray, stiff.	
20									248.9
25			3	75	BG		ML	Silt, light olive gray with some reddish-brown staining and mottling.	
30									238.9
							SP	(30-47') Fluvial Deposits (see descriptions below). (30-34') Fine sand, tan to yellowish-brown.	
35							SW	Sand, medium to coarse-grained, reddish-brown to light brown.	234.9
							SW GW	Sand and gravel, reddish-brown, majority of gravel from 40' to 47', with gravel up to 2" in longest dimension.	232.9
40									

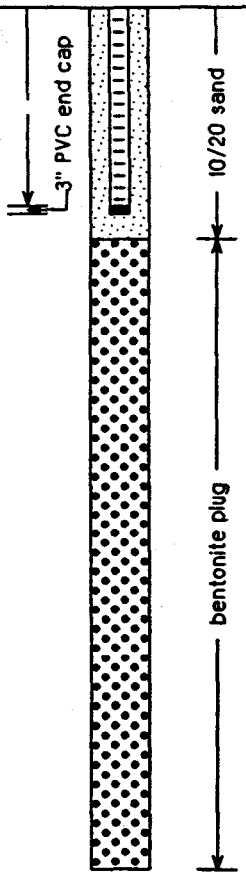
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well OBGG12UF (BGMW12UF)
Project: *NSA Memphis*	Location: *Millington, TN. Background Location #12*
Project No.: *0106-08420*	Surface Elevation: *268.90 feet msl*
Started at *1415 on 2-18-96*	TOC Elevation: *268.71 feet msl*
Completed at *1530 on 2-18-96*	Depth to Groundwater: *9.09 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *259.62 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *66.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			4	100	BG		SW/GW		
								Cockfield Formation: sand, silt, and clay, light olive gray to light yellowish-brown, micaceous, finely lignitic, with streaks of clay throughout.	221.9
50									
55							SC/SM		
60			5	80	BG				
65									202.9
								Soil boring terminated at 66.0'.	
70									
75									
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall

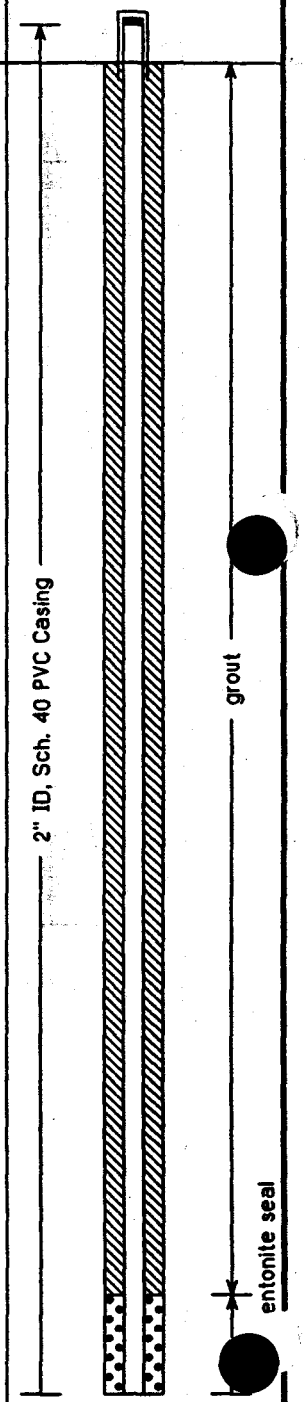
Monitoring Well OBGG13UF

(BGMW13UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #13*
Project No.: *0106-08420*	Surface Elevation: *289.70 feet msl*
Started at *1235 on 3-5-96*	TOC Elevation: *292.28 feet msl*
Completed at *1500 on 3-5-96*	Depth to Groundwater: *36.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.37 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D.L., W.P.*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	BG		OL	(0-1') Soil, silt, moderate yellowish-brown, with roots and organic material.	288.7
			2	100	BG		ML	(1-5') Silt, moderate yellowish-brown mottled with light olive gray, with roots and organic material, moist.	284.7
5							CL ML	(5-7') Silty clay, dark yellowish-brown mottled with light olive gray, with organic material.	282.7
10			3	55	BG		ML	(7-19') Silt, moderate yellowish-brown mottled with light olive gray and olive gray, with dark yellowish-orange iron staining, contains iron-manganese nodules, moist.	
15								Prevalent iron staining near 16'.	
								Becoming mottled with olive-gray to dark greenish-gray near 19'.	270.7
20			4	70	BG		CL ML	(19-26.5') Silty clay, olive gray to dark greenish-gray, with moderate yellowish-brown to dark yellowish-orange iron staining and iron-manganese nodules.	
25								Very silty near 22'.	263.2
30			5	130	BG		ML	(26.5-32.5') Clayey silt, moderate yellowish-brown mottled with olive gray, with dark yellowish-orange iron staining, contains iron- manganese nodules and iron concretions, moist.	257.2
35							CL	(32.5-43') Clay, yellowish-gray to light olive gray, stained dark yellowish-orange, contains iron concretions, very hard and stiff. Silty near 32.5'.	
40									

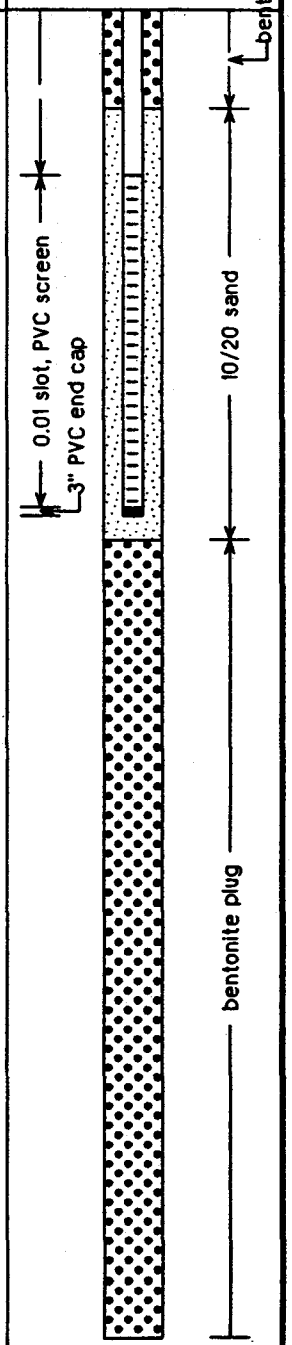
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well OBGG13UF (BGMW13UF)
Project: *NSA Memphis*	Location: *Millington, TN. Background Location #13*
Project No.: *0106-08420*	Surface Elevation: *289.70 feet msl*
Started at *1235 on 3-5-96*	TOC Elevation: *292.28 feet msl*
Completed at *1500 on 3-5-96*	Depth to Groundwater: *36.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.37 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D.L., W.P.*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			6	125	BG		CL		
							SC	(43-94') Fluvial Deposits (see descriptions below).	246.7
45							SP	(43-44') Clayey sand, fine-grained, very light gray mottled with dark yellowish-orange, wet.	245.7
								(44-48') Sand, fine (see descriptions below).	241.7
50			7	130	BG		SP	(44-46') Sand, fine-grained, yellowish-gray to dusky yellow, wet from 44-45', becoming very light gray near 46'. Some organic material and a clay seam present near 45'.	
								(46-48') Sand, fine-grained, yellowish-gray to dark yellowish-orange, micaceous, wet, with a clay seam near 47'.	236.7
55							SP	(48-53') Sand, fine-grained, yellowish-gray to pinkish-gray, micaceous, wet.	
								(53-60') Sand, fine-grained, yellowish-gray stained dark yellowish- orange, wet.	
60								With sparse oraganic material near 55'.	229.7
			9	90	BG			(60-76') Sand and gravel (see descriptions below).	
65								(60-66') Sand, fine to very coarse-grained, and gravel up to 2.5" in longest dimension, dark yellowish-orange to moderate yellowish-brown, wet, gravel is mostly angular to rounded quartz and chert.	
70			10	65	BG		GW SW	(66-76') Sand, fine to very coarse-grained, and gravel up to 3" in longest dimension, moderate yellowish-brown to grayish-orange, wet.	
75									213.7
							SW GW	(76-77') Gravel up to 1" in longest dimension, and sand, very coarse, moderate yellowish-brown to dark yellowish-orange, wet.	212.7
							SP		
80									

WELL DIAGRAM



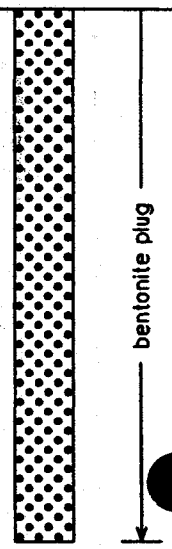
EnSafe/Allen & Hoshall

Monitoring Well OBGG13UF
(BGMW13UF)

Project: *NSA Memphis*	Location: *Millington, TN. Background Location #13*
Project No.: *0106-08420*	Surface Elevation: *289.70 feet msl*
Started at *1235 on 3-5-96*	TOC Elevation: *292.28 feet msl*
Completed at *1500 on 3-5-96*	Depth to Groundwater: *36.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.37 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96.0 feet*
Geologist: *D.L., W.P.*	Well Screen: *45 to 55 feet*

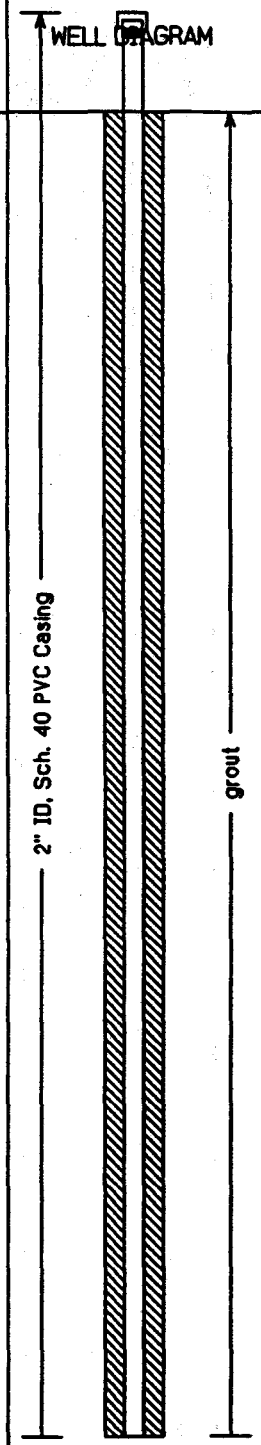
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			11	100	BG		SP	(77-85') Sand, fine-grained, and scattered gravel up to 3" in longest dimension, grayish-orange, wet.	
85							SW GW	(85-86.5') Sand, fine to very coarse-grained, and gravel up to 1.5" in longest dimension, grayish-orange to dark yellowish orange, wet.	204.7 / 203.2
90			12	100	BG		SW	(86.5-91.5') Sand, fine to medium-grained, with mostly scattered gravel up to 2" in longest dimension, grayish-orange, wet.	198.2
95							SW GW SC GC SC SP	(91.5-92.5') Sand, coarse to very coarse-grained, and gravel up to 2" in longest dimension, moderate yellowish-brown to dark yellowish- orange, wet.	197.2 / 195.7
								(92.5-94.5') Very clayey sand, fine to very coarse-grained, and gravel up to 2.5" in longest dimension, dark yellowish-orange, wet.	194.2 / 193.7
100								(94-95.5') Cockfield Formation: Very clayey sand, very fine to fine-grained, dark yellowish-orange mottled with sparse very light gray.	
								(95.5-96') Sand, very fine to fine-grained, medium light gray, slightly micaceous, wet.	
105								Soil boring terminated at 96'.	
110									
115									
120									

WELL DIAGRAM



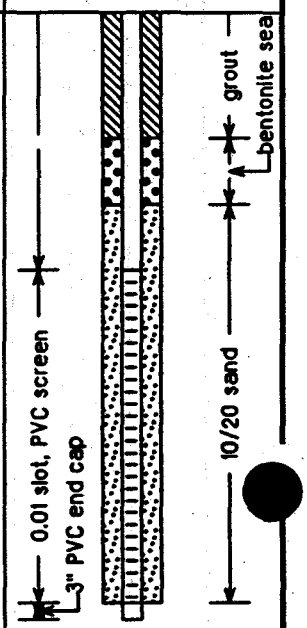
EnSafe/Allen & Hoshall	Monitoring Well OBGG14UF Boring
Project: *NSA Memphis*	Location: *Millington, TN. Background Location #14*
Project No.: *0106-08420*	Surface Elevation: *feet msl*
Started at *on 3-5-96*	TOC Elevation: *feet msl*
Completed at *on 3-5-96*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Hollow Stem Auger*	Groundwater Elevation: *feet msl*
Drilling Company: *TriState Drilling*	Total Depth: *57.8 feet*
Geologist: *C. Ivey*	Well Screen: *to feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
5										
10										
15										
20										
25										
30										
35										
40										



EnSafe/Allen & Hoshall	Monitoring Well OBGG14UF Boring
Project: *NSA Memphis*	Location: *Millington, TN. Background Location #14*
Project No.: *0106-08420*	Surface Elevation: *feet msl*
Started at *on 3-5-96*	TOC Elevation: *feet msl*
Completed at *on 3-5-96*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Hollow Stem Auger*	Groundwater Elevation: *feet msl*
Drilling Company: *TriState Drilling*	Total Depth: *57.8 feet*
Geologist: *C. Ivey*	Well Screen: *to feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45										
50										
55										
60										
65										
70										
75										
80										



SWMU 2

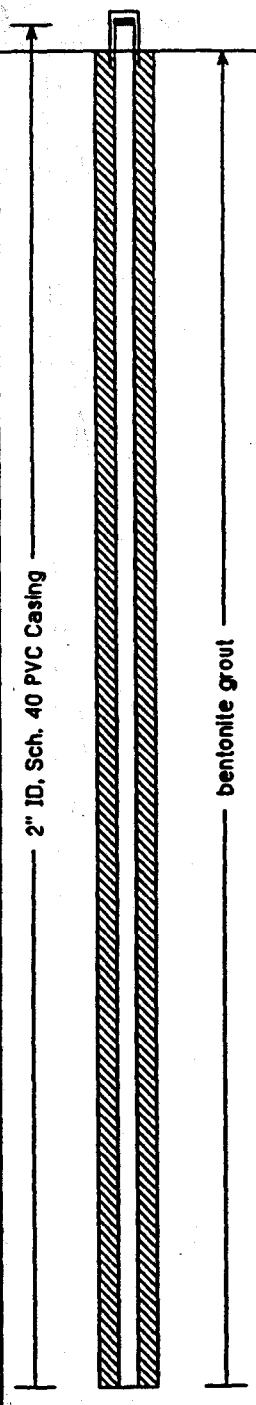
EnSafe/Allen & Hoshall

Monitoring Well 002G01DA

Project: NSA Memphis	Location: Millington, TN SWMU#2 - Southside Landfill
Project No.: 106-08420	Surface Elevation: 266.90 feet msl
Started at 1400 on 2-12-96	TOC Elevation: 269.55 feet msl
Completed at 1645 on 2-12-96	Depth to Groundwater: 6.49 feet Measured: 4/10/96
Drilling Method: Rotasonic - 4" core barrel inside 6" casing	Groundwater Elevation: 263.06 feet msl
Drilling Company: Alliance Environmental, Inc.	Total Depth: 66.0 feet
Geologist: J. Kingsbury	Well Screen: 48 to 58 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-39') Upper Alluvium (see descriptions below).	
			1	66	BG			Clayey silt, moderate yellowish-brown to light brown.	
5								Some organics and iron staining (5'-6').	
								Clayey silt, moderate yellowish brown, moist, abundant organic and iron specks from 6' to 10' becoming less frequent from 10' to 16'.	
10			2	90	BG				
15								Clayey silt, olive green with dark yellowish-orange mottling.	
								Silt, light olive gray to greenish-gray, wet at 20', some minor sand 25' to 26', sulfur-like odor.	
20			3	100	BG		ML		
25								Same as above, shell and small snail fragments, organic debris, wood at 28'.	
30			4	100	BG				
35									
40							SW GW	(39-59') Deeper Alluvium (see descriptions below).	227.9

WELL DIAGRAM



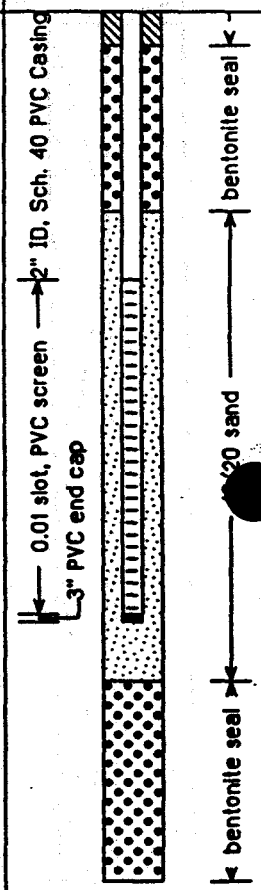
EnSafe/Allen & Hoshall

Monitoring Well 002G01DA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *268.90 feet msl*
Started at *1400 on 2-12-96*	TOC Elevation: *269.55 feet msl*
Completed at *1645 on 2-12-96*	Depth to Groundwater: *6.49 feet* Measured: *4/10/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *263.06 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *66.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *48 to 58 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	30	BG		SW GW	(39-48') Sand and gravel, light yellowish-brown. Contact is approximate; location unceratin due to poor return in the core barrel.	
45									218.9
50			6	120	BG		SW	Sand, light yellowish-brown, gravel from 48' to 56'.	
55									210.9
							SW GW	Sand and gravel, light yellowish brown.	
								Gravel is up to 3" diameter.	207.9
60			7	100	BG		SC	Cockfield Formation: Silty fine-grained sand, tan to light brown at contact. Changes to medium-gray, silty and clayey fine-grained sand below, micaceous, mottled with light brown silt and fine sand.	
65									200.9
								Soil boring terminated at 66'.	
70									
75									
80									

WELL DIAGRAM



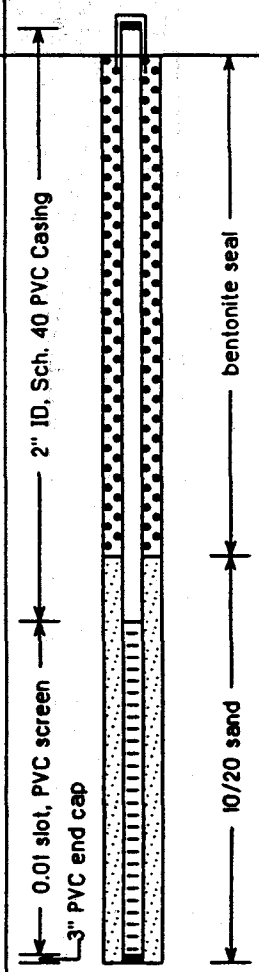
EnSafe/Allen & Hoshall

Monitoring Well 002G01UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *268.72 feet msl*
Started at *0800 on 2-13-96*	TOC Elevation: *269.30 feet msl*
Completed at *0900 on 2-13-96*	Depth to Groundwater: *11.52 feet* Measured: *4/9/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *257.78 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1					(0-27') Upper Alluvium (see descriptions below).	
								Clayey silt, moderate yellowish brown to light brown.	
5								Some organics and iron staining (5'-6').	
								Clayey silt, moderate yellowish brown, moist, abundant organic and iron specks from 6' to 10' becoming less frequent from 10' to 16'.	
		◢	2					speckles.	
10									
							ML		
		◢	3					Clayey silt, olive green with dark yellowish orange mottling.	
								Silt, light olive gray to greeenish-gray, wet at 20', some minor sand 25' to 26', sulfur-like odor.	
15									
20									
25								Same as above, shell and small snail fragments, organic debris	239.7
								Boring terminated at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G01DA.	
30									
35									
40									

WELL DIAGRAM



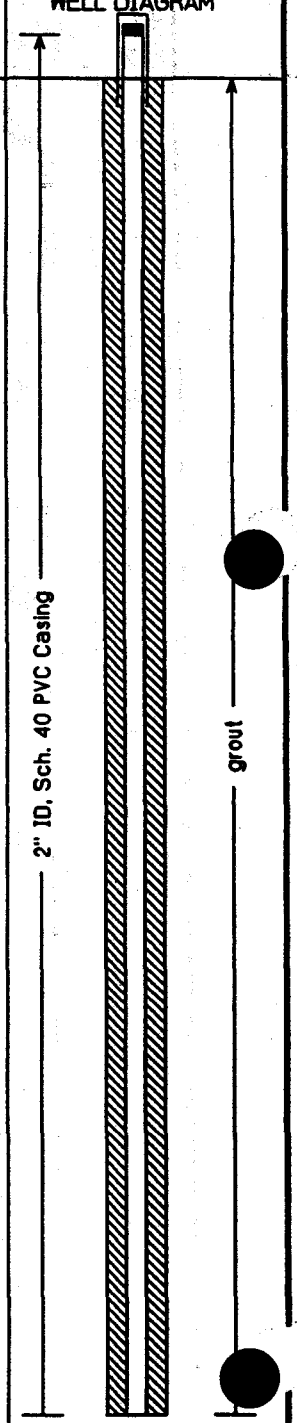
EnSafe/Allen & Hoshall

Monitoring Well 002G02DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.09 feet msl*
Started at *0745 on 2-7-96*	TOC Elevation: *269.56 feet msl*
Completed at *0843 on 2-7-96*	Depth to Groundwater: *9.74 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *259.82 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *41 to 51 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-38') Upper Alluvium (see descriptions below).	266.1
								(0-1') Soil.	
								(1-15') Silt (see descriptions below).	
			1	90	BG			(1-4') Silt, very clayey, moderate yellowish-brown.	
5								(4-6') Silt, moderate yellowish-brown, very dry from 4' to 5'.	
								(6-15') Silt, moderate yellowish-brown mottled with some light olive gray, with considerable iron staining and manganese nodules, especially from 14 to 15'.	
							ML		
10			2	46	BG				
								(14-15') Becoming moist.	
15									252.1
								(15-27') Silt, clayey, dark greenish-gray (see descriptions below).	
								(15-16') Silt, very clayey, dark greenish-gray, moist.	
								(16-26') Same as above, with some snail shell fragments.	
20							ML		
			3	89	BG				
								Slightly sandy from 23' to 26'.	
25									

WELL DIAGRAM



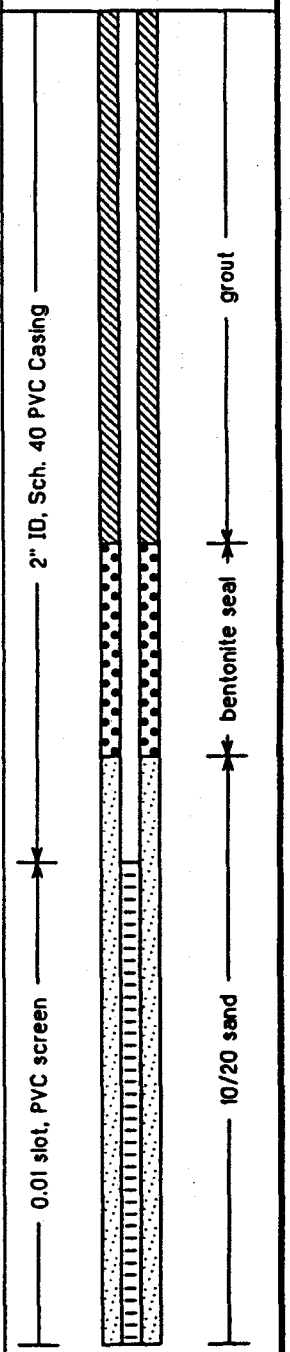
EnSafe/Allen & Hoshall

Monitoring Well 002G02DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.09 feet msl*
Started at *0745 on 2-7-96*	TOC Elevation: *269.56 feet msl*
Completed at *0843 on 2-7-96*	Depth to Groundwater: *9.74 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *259.82 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *41 to 51 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	(26-27') Same as above, becoming mottled with olive gray.	240.1
							ML	(27-30') Sandy silt, olive gray, moist.	237.1
30			4	100	BG		SM	(30-31') Silty sand; medium to coarse-grained, olive gray, wet, wood at 30'.	236.1
							ML	(31-32') Sandy silt; olive gray, moist.	235.1
							SM	(32-33') Silty sand; medium to coarse-grained with small diameter gravel, olive gray, wet, wood at 33'.	234.1
35							ML	(33-37.5') Silt (see descriptions below). (33-36') Clayey silt, olive gray with some snail shell fragments, moist. Some greenish-gray color material at 33.5'. (36-37.5') Same as above, becoming slightly sandy.	229.1
							SW/GW	(38-53') Deeper Alluvium (see descriptions below).	
40			5	100	BG		SM/GW	(38-40.5') Sand and gravel; sand is fine to coarse-grained, gravel is up to 0.5" in longest dimension, light olive gray to olive gray, with olive gray clay seams, wet. Wood at 38.5' and 40'.	226.6
45							SW	(40.5-45') Silty sand and gravel; sand is coarse to very coarse- grained, gravel is up to 1.5" in longest dimension; mostly olive gray at 40.5' becoming moderate yellowish-brown mottled with light gray below, wet. Becoming lighter in color near 45'.	222.1
							SW/GW	(45-46') Sand, medium to coarse-grained, dark yellowish-orange, with a few small pieces of gravel.	221.1
50							SW/GW	(46-50') Gravel and sand; gravel is up to 3.5" in longest dimension; moderate yellowish-brown to dark yellowish-orange, wet.	217.1

WELL DIAGRAM



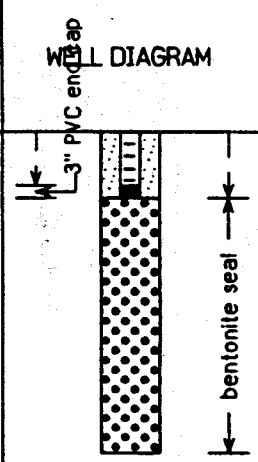
EnSafe/Allen & Hoshall

Monitoring Well 002G02DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.09 feet msl*
Started at *0745 on 2-7-96*	TOC Elevation: *269.56 feet msl*
Completed at *0843 on 2-7-96*	Depth to Groundwater: *9.74 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *259.82 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *41 to 51 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			6	95	BG		SW GW	(50-51') Sand, medium to very coarse-grained and gravel up to 2" in longest dimension. Moderate yellowish-brown mottled with light gray material, wet.	217.1
							CL ML	(51.5-53') Silty and sandy clay with gravel up to 2.5" in longest dimension. Very light gray mottled with moderate yellowish-brown and dark yellowish-orange material. Wet.	215.6
55							SP SC	Cockfield Formation: Sand, fine-grained, very light gray mottled with moderate yellowish-brown and dark yellowish-orange material, slightly clayey, wet from 53' to 54'. With splotches of light brownish-gray material at 55', becoming very fine dark yellowish-orange sand below 55'.	214.1
								Terminated soil boring at 56'.	211.1
60									
65									
70									
75									

WELL DIAGRAM



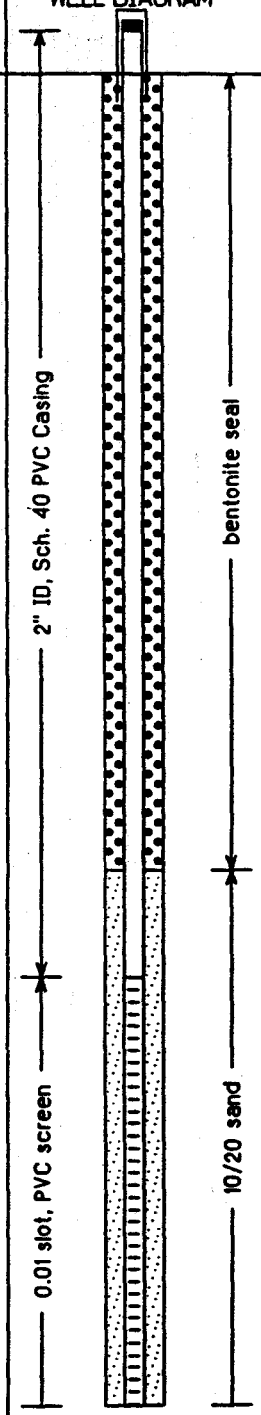
EnSafe/Allen & Hoshall

Monitoring Well 002G02UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.43 feet msl*
Started at *1150 on 2-12-96*	TOC Elevation: *269.57 feet msl*
Completed at *1230 on 2-12-96*	Depth to Groundwater: *10.64 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *258.93 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1				OL	(0-27') Upper Alluvium (see descriptions below).	266.4
								(0-1') Soil.	
								(1-15') Silt (see descriptions below).	
								(1-4') Silt, very clayey, moderate yellowish-brown.	
5								(4-6') Silt, moderate yellowish-brown, very dry from 4' to 5'.	
								(6-15') Silt, moderate yellowish-brown mottled with some light olive gray, with considerable iron staining and iron-manganese nodules, especially from 14' to 15'.	
		■	2				ML		
10									
								(14-15') Becoming moist.	
15		■	3						252.4
								(15-27') Silt, clayey, dark greenish-gray (see descriptions below).	
								(15-16') Silt, very clayey, dark greenish-gray, moist.	
								(16-26') Same as above with some snail shell fragments.	
20							ML		
								Slightly sandy from 23' to 26'.	
25									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 002G02UA
Project: NSA Memphis	Location: Millington, TN. SWMU#2 – Southside Landfill
Project No.: 106-08420	Surface Elevation: 267.43 feet msl
Started at 1150 on 2-12-96	TOC Elevation: 269.57 feet msl
Completed at 1230 on 2-12-96	Depth to Groundwater: 10.64 feet Measured: 4/8/96
Drilling Method: Rotasonic – 4" core barrel inside 6" casing	Groundwater Elevation: 258.93 feet msl
Drilling Company: Alliance Environmental, Inc.	Total Depth: 27.0 feet
Geologist: D. Ladd, W. Parks	Well Screen: 17 to 27 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							ML	(26-27') Same as above, becoming mottled with olive gray material.	240.4	10/20 sand
								Soil boring terminated at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G02DA.		
30										
35										
40										
45										
50										

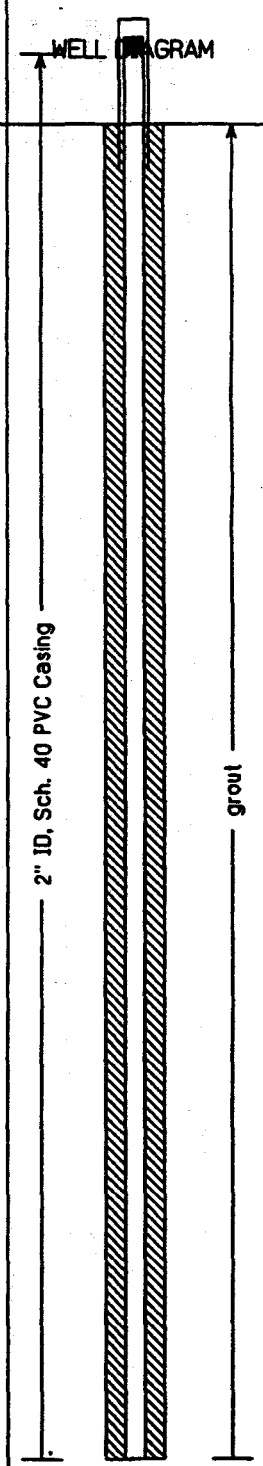
EnSafe/Allen & Hoshall

Monitoring Well 002G03DA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *1015 on 2-6-96*	TOC Elevation: *269.62 feet msl*
Completed at *1150 on 2-6-96*	Depth to Groundwater: *10.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *258.71 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *60.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL GP	(0-29') Upper Alluvium (see descriptions below). (0-2') Soil, gravel, and asphalt.	265.2
			1	42	1.5		ML	(2-6') Clayey silt; olive gray to light olive gray to greenish-gray. Contains some iron-manganese nodules.	261.2
5									
							ML	(6-13.5') Silt, moderate yellowish-brown mottled with light olive gray material.	
10			2	83	BG			(11.5-13.5') Becoming moist with iron staining and iron-manganese nodules.	253.7
							ML	(13.5-30') Silt (see descriptions below). (13.5-26') Silt, olive gray to greenish-gray. Moist.	
15									

WELL DIAGRAM



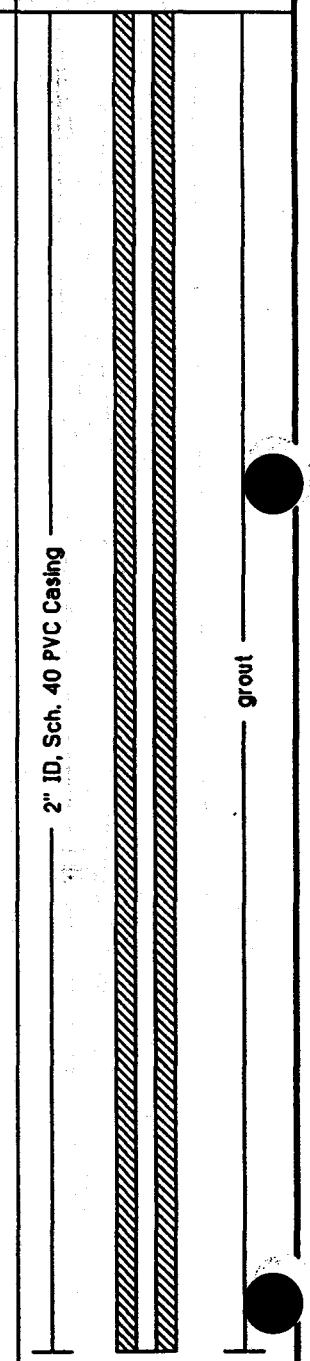
EnSafe/Allen & Hoshall

Monitoring Well 002G03DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *1015 on 2-6-96*	TOC Elevation: *269.62 feet msl*
Completed at *1150 on 2-6-96*	Depth to Groundwater: *10.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *258.71 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *60.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
20			3	65	BG		ML	Iron-manganese nodules below 20', becoming more moist with scattered shell fragments. Becoming slightly sandy below 22'. Wood fragment at 25.5'.	
25								(26-30') Sandy and clayey silt with iron-manganese nodules. Wood fragments from 28' to 29'.	
30							SW	(29-48') Deeper Alluvium (see descriptions below).	238.2

WELL DIAGRAM



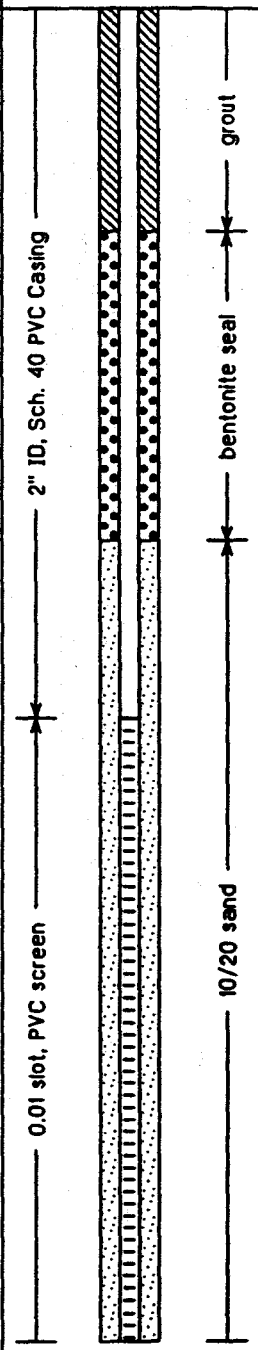
EnSafe/Allen & Hoshall

Monitoring Well 002G03DA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *1015 on 2-6-96*	TOC Elevation: *269.62 feet msl*
Completed at *1150 on 2-6-96*	Depth to Groundwater: *10.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *258.71 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *60.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			4	66	BG		SW	(29-35') Sand, fine to medium-grained, olive gray in color. Coarsens downward. Moist. Contains few snail shell fragments.	
35							SW	(35-38') Sand, medium to coarse (see descriptions below). (35-36') Sand, medium to coarse-grained, olive gray, wet. (36-38') Sand, medium to coarse, olive gray to light olive gray color. Coarser with gravel near 38'.	232.2
			5	95	BG		SW SC	(38-39.5') Sand, slightly clayey with gravel, medium to very coarse- grained, moderate yellowish-brown, wet.	229.2
							SW SC	Clay and sand with gravel, light gray mottled with moderate yellowish- brown.	227.7
40			6					Shelby tube sample collected from 40' to 43', no lithologic description available.	227.2
45							SW GW	(43-45.5') Sand, medium to very coarse-grained, and gravel up to 1.5" in longest dimension. Moderate yellowish-brown color mottled with some light gray material. Less gravel near 45.5'. Wet.	224.2

WELL DIAGRAM



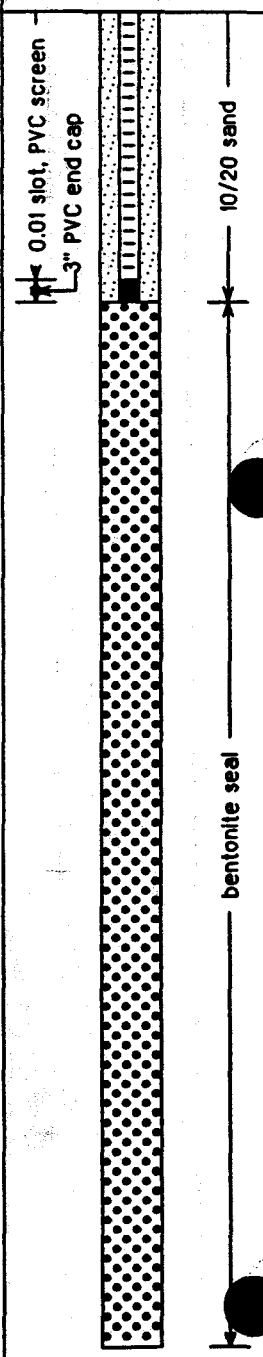
EnSafe/Allen & Hoshall

Monitoring Well 002G03DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *1015 on 2-6-96*	TOC Elevation: *269.62 feet msl*
Completed at *1150 on 2-6-96*	Depth to Groundwater: *10.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *258.71 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *60.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW GW		221.7
			7	121	BG		SP	(45.5–46') Sand; fine to medium-grained, light gray with some pinkish-gray.	221.2
							SW GW	(46–46.5') Sand, medium to coarse-grained, and gravel; moderate yellowish-brown, wet.	220.7
							SW GW	(46.5–48') Sand, medium to very coarse-grained, and gravel; olive-gray color, wet. Bottom 3" is moderate yellowish-brown sand and gravel, with gravel piece up to 3" in longest dimension.	219.2
								(48–54') Cockfield Formation: Sand; fine-grained.	
50								(48–49.5') Light gray.	
								(49.5–50') Dusky yellow.	
							SP	(50–54') Light gray.	
								(54–60') Clay (see descriptions below).	213.2
55			8	110	BG			(54–58') Silty and sandy clay; olive gray with sand seams, olive gray, dark yellowish-orange sand at top. Lignite seam near 58'.	
							CL		
								(58–60') Clay; olive gray in color.	
								Terminated soil boring at 60'.	
60									207.2

WELL DIAGRAM



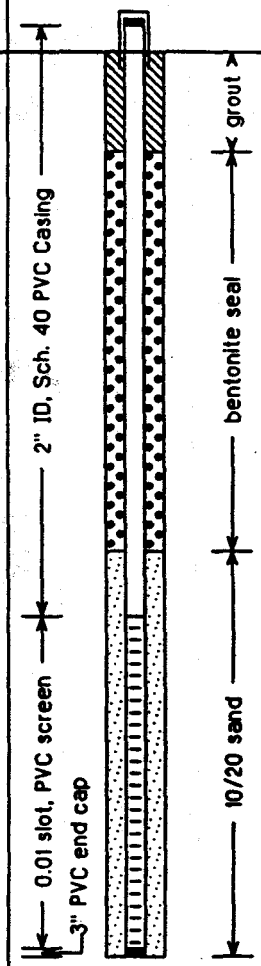
EnSafe/Allen & Hoshall

Monitoring Well 002G03UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.28 feet msl*
Started at *1400 on 2-6-96*	TOC Elevation: *269.73 feet msl*
Completed at *1500 on 2-6-96*	Depth to Groundwater: *13.09 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *256.64 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1				OL GP	(0-27') Upper Alluvium (see descriptions below).	
								(0-2') Soil, gravel and asphalt.	265.3
5							ML	(2-6') Clayey silt; olive gray to light olive gray to greenish-gray. Contains some iron-manganese nodules.	261.3
								(6-13.5') Silt, moderate yellowish-brown and mottled with light olive gray material.	
		■	2						
10							ML	(11.5-13.5') Becoming moist with iron staining and iron-manganese nodules.	
									253.8
								(13.5-27') Silt (see descriptions below).	
15		■	3					(13.5-26') Silt, olive gray to greenish-gray. Moist.	
20							ML	Iron-manganese nodules below 20', becoming more moist with scattered shell fragments.	
								Becoming slightly sandy below 22'.	
25								Wood fragment at 25.5'.	
								(26-27') Sandy and clayey silt with iron-manganese nodules.	240.3
30								Terminated soil boring at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G03DA.	
35									
40									

WELL DIAGRAM



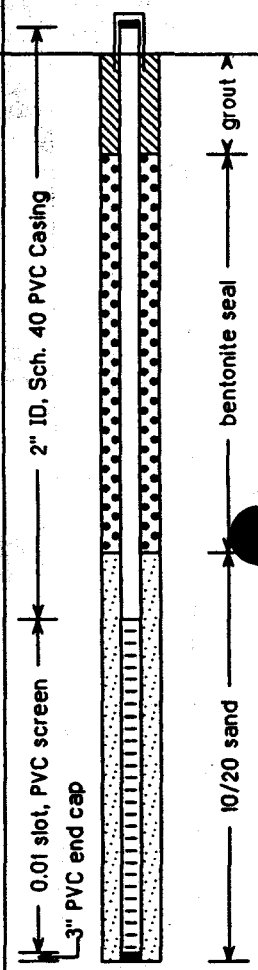
EnSafe/Allen & Hoshall

Monitoring Well 002G04UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *268.53 feet msl*
Started at *1455 on 2-5-96*	TOC Elevation: *268.76 feet msl*
Completed at *1515 on 2-5-96*	Depth to Groundwater: *8.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *259.85 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1				OL	(0-3.5') Soil and roots.	
									263
5							ML	(3.5-16') Silt (see descriptions below). (3.5-6') Silt, moderate yellowish-brown mottled with light olive gray, with considerable iron staining.	
10		■	2					(6-16') Silt, olive gray to light olive gray mottled with moderate yellowish-brown. Moist from 12' to 16'. Contains iron-manganese nodules from 13' to 16'.	
15		■	3					Mottled with dark yellowish-orange near 16'.	
									250.5
								No description available, collected Shelby tube from 16' to 19' for geotechnical analysis.	
									247.5
20							ML	(19-27') Silt (see descriptions below). (19-26') Silt, olive gray to greenish-gray, with a very few snail shell fragments, moist. With very fine sand below 22'. Contains roots below 23'.	
25								Contains iron-manganese nodules from 24' to 26'.	
									239.5
30								(26-27') Silt, sandy (very fine-grained), olive gray to greenish-gray, contains snail shell fragments, moist. Terminated soil boring at 27'. Note: No samples were collected for lithologic description; these descriptions were transferred from the log of adjacent soil boring 002S0029DA.	
35									
40									

WELL DIAGRAM



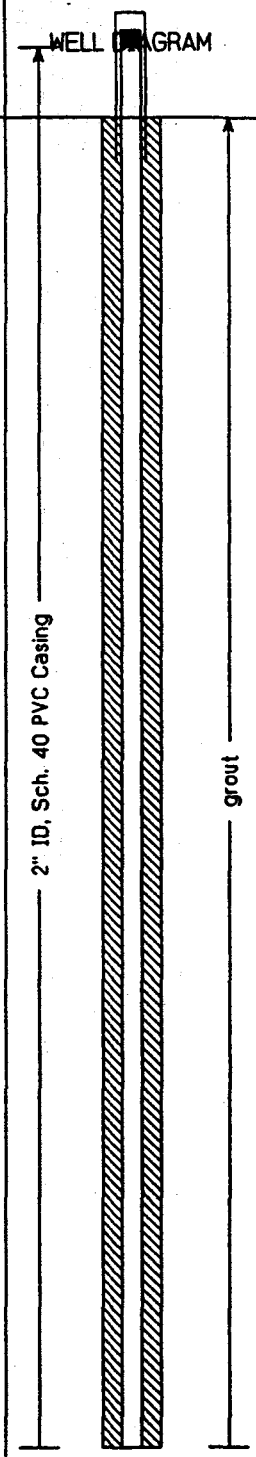
EnSafe/Allen & Hoshall

Monitoring Well 002G05DA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *0850 on 2-5-96*	TOC Elevation: *269.33 feet msl*
Completed at *1030 on 2-5-96*	Depth to Groundwater: *12.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *256.34 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *40.5 to 50.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-15.5') Silt (see descriptions below).	
					BG			Moderate yellowish-brown and mottled with some light olive gray Contains scattered iron-manganese nodules.	
			1	88	BG				
5					BG				
					BG		ML		
					BG				
10									
			2	80	BG			Slightly moist near 11'.	
					BG				
								Becoming mottled with some dark greenish-gray material near 14'.	
15					BG				

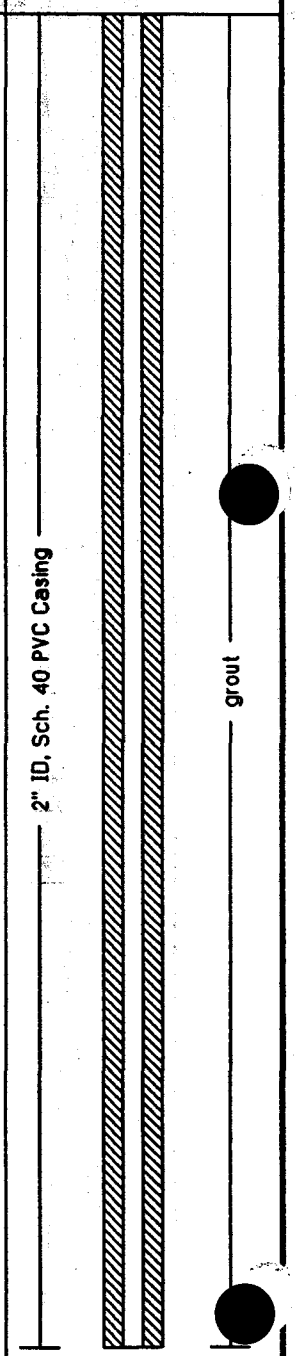
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 002G05DA
Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *0850 on 2-5-96*	TOC Elevation: *269.33 feet msl*
Completed at *1030 on 2-5-96*	Depth to Groundwater: *12.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *256.34 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *40.5 to 50.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Increase in percentage of iron-manganese nodules near 15.5'.	251.7
								(15.5-26') Silt (see descriptions below).	
								Dark greenish-gray, slightly moist.	
					BG			Becoming light olive gray to greenish-gray with depth.	
					BG				
20								Snail shell fragments near 20'.	
							ML		
			3	75	BG				
					BG				
25					BG				
							ML	No description available due to no sample recovery.	241.2
				0					
								(28-34') Silt and very-fine grained sand with rare snail shell fragments, moist.	239.2
					BG		ML SP		
30									

WELL DIAGRAM



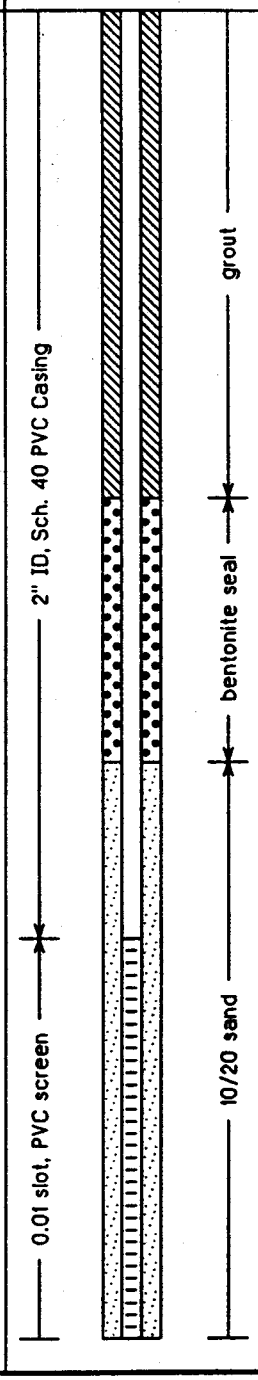
EnSafe/Allen & Hoshall

Monitoring Well 002G05DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *0850 on 2-5-96*	TOC Elevation: *269.33 feet msl*
Completed at *1030 on 2-5-96*	Depth to Groundwater: *12.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *256.34 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *40.5 to 50.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			4	71	BG	ML SP		
					BG			
						SM	(34-50') Fluvial Deposits (see descriptions below). (34-34.5') Sand, fine to coarse-grained, mixed with silt, olive gray to greenish-gray with snail shell fragments, moist.	233.2
						ML		232.7
35					BG			232.2
						ML	(34.5-35') Silt; olive gray to greenish-gray. Dry.	
					BG		(35-37') Clayey silt with some fine to medium-grained sand and a few pieces of dark-colored gravel, olive-gray, moist. Wood at 35.5'.	230.2
						SM	(37-39') Silty sand, fine to very coarse-grained, with quartz and chert gravel, olive gray, wet.	
					BG			228.2
						ML	(39-39.5') Silt; olive gray to light brownish-gray. Dry.	227.7
40			5	100		SW GW	(39.5-41') Sand, coarse to very coarse-grained, and gravel up to 2.5" in longest dimension, olive gray near 39.5', then very light gray mottled with moderate yellowish-brown, wet.	
					BG			226.2
						SP GW	(41-43') Sand and gravel; sand is very coarse-grained, some gravel appears weathered; moderate yellowish-brown mottled with some light olive gray material, wet.	
					BG			224.2
						SP GW	(43-43.5') Sand and gravel, dark yellowish-orange in color, wet.	223.7
						GW SW	(43.5-44') Gravel and sand, wet; gravel is gray and red in color and up to 1.5" in longest dimension, sand is light gray.	223.2
						GW SW		
45					BG			

WELL DIAGRAM



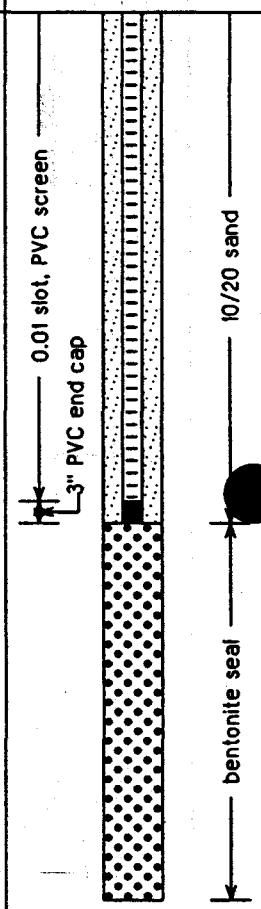
EnSafe/Allen & Hoshall

Monitoring Well 002G05DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.16 feet msl*
Started at *0850 on 2-5-96*	TOC Elevation: *269.33 feet msl*
Completed at *1030 on 2-5-96*	Depth to Groundwater: *12.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *256.34 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *40.5 to 50.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							GW SW	(44-46') Gravel and sand; gravel is up to 3" in longest dimension and dark gray, sand is moderate yellowish-brown to dark yellowish-orange, wet.	221.2
							GW SW		220.7
					BG			(46-46.5') Gravel and sand; gravel is up to .75" in longest dimension, sand is coarse-grained and moderate yellowish-brown to dark yellowish-orange, wet.	
							GW SW	(46.5-50.5') Gravel and sand; gravel is up to 3" in longest dimension, sand is very coarse-grained and moderate yellowish-brown to dark yellowish-orange, wet.	
					BG				
50			6	93	BG				217.2
					BG		SC	(50.5-52.5') Cockfield Formation: clayey sand; fine-grained, stained moderate yellowish-brown to dark yellowish-orange with some very light gray seams of material.	
									214.7
					BG		SP	(52.5-55') Sand, fine-grained, very light gray color mottled with some dark yellowish-orange material.	
					BG				
55								Soil boring terminated at 55'.	212.2
60									

WELL DIAGRAM



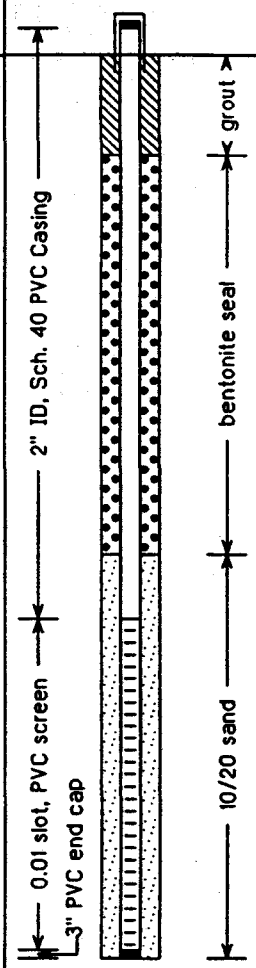
EnSafe/Allen & Hoshall

Monitoring Well 002G05UA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.14 feet msl*
Started at *1315 on 2-5-96*	TOC Elevation: *269.39 feet msl*
Completed at *1400 on 2-5-96*	Depth to Groundwater: *11.45 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *257.94 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1				ML	(0-15.5') Silt; moderate yellowish-brown mottled with some light olive gray material. Contains sattered iron-manganese nodules.	
5									
		◢	2					Slightly moist near 11'.	
10									
		◢	3					Becoming mottled with some dark greenish-gray material near 14'.	
15								Increase in percentage of iron-manganese nodules near 15.5'.	251.6
							ML	(15.5-26') Silt, dark greenish-gray, slightly moist.	
20								Becoming light olive gray to greenish gray with depth.	
								Snail shell fragments near 20'.	
25									241.1
								No description available due to no sample recovery from 26' to 27'.	240.1
30								Terminated soil boring at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G05DA.	
35									
40									

WELL DIAGRAM



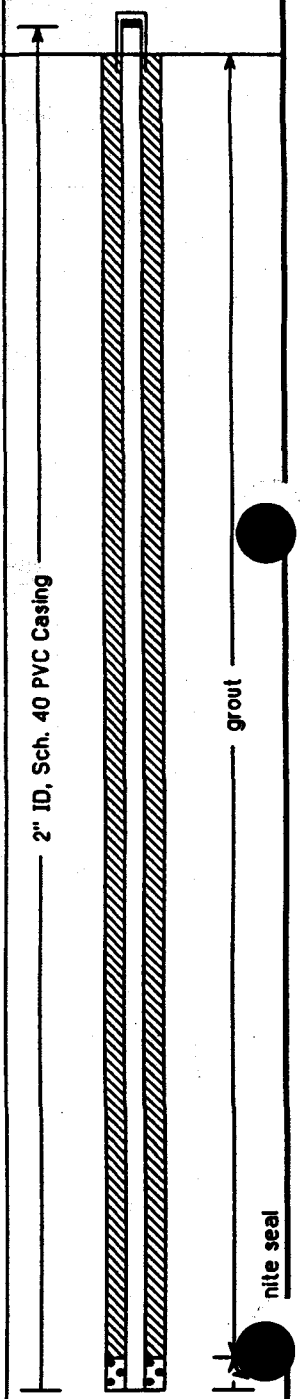
EnSafe/Allen & Hoshall

Monitoring Well 002G06DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.86 feet msl*
Started at *0925 on 2-2-96*	TOC Elevation: *269.69 feet msl*
Completed at *1030 on 2-2-96*	Depth to Groundwater: *16.52 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *253.17 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *44.5 to 54.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL GP	(0-32') Upper Alluvium (see descriptions below).	
			1	75	8			(0-.5') Soil, gravel, and asphalt.	
5							ML	(.5-15') Silt, mostly moderate yellowish-brown to light olive gray.	
								(.5-6') Silt; moderate yellowish-brown mottled with light olive gray material. Some iron staining and rare iron-manganese nodules.	
10			2	53	5			(6-14') Percentage of light olive gray-colored material decreases down to 14'.	
15								(14-15') Becoming mostly light olive gray to greenish-gray mottled with moderate yellowish-brown. Abundant iron staining and iron- manganese nodules just above 15'.	252.9
							ML	(15-19') Silt, olive gray to dark greenish-gray. Wet from 16-19'.	248.9
20			3	50	5		ML	(19-25') Silt, dark greenish-gray mottled with brownish-gray material. Some snail shell fragments present.	
25								Some iron-manganese nodules at 24'. Wood at 25'.	242.9
							ML	(25-29') Silt, olive gray to greenish-gray in color. Rare snail shell fragments and wet from 26-29'.	238.9
30			4	78	4		SM ML	(29-32') Sand, very fine-grained, and silt; greenish-gray, rare snail shell fragments, wet. Becoming olive gray in color near 32'.	235.9
							SW SC	(32-54') Deeper Alluvium (see descriptions below).	
35								(32-36') Sand, fine to coarse-grained, with clay seams. Olive-gray in color with rare snail shell fragments, wet. Wood near 34'.	231.9
							SW	(36-39') Sand, fine to coarse-grained, olive gray, with scattered gravel and snail shell fragments, wet.	228.9
40							SW		

WELL DIAGRAM



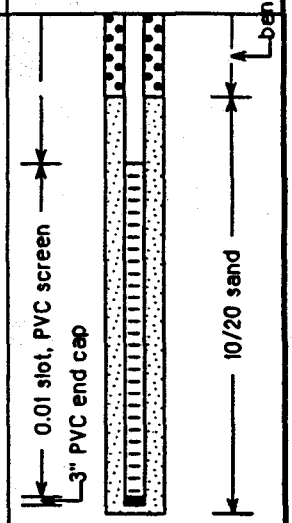
EnSafe/Allen & Hoshall

Monitoring Well 002G06DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.86 feet msl*
Started at *0925 on 2-2-96*	TOC Elevation: *269.69 feet msl*
Completed at *1030 on 2-2-96*	Depth to Groundwater: *16.52 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *253.17 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *44.5 to 54.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	90	4		SW	(39–44') Sand, fine to coarse, olive gray with gravel up to 1" in longest dimension. Rare snail shell fragments, wet.	
								Clay seams (3" to 5" thick) at 40', 41', 42', and 43.5'.	223.9
45							SW GW	(44–46.5') Sand, very coarse-grained, and gravel up to 2.5" in longest dimension. Moderate yellowish-brown mottled with light olive gray material, wet.	221.4
							ML		219.9
50			6	106	4		SP GW	(46.5–48') Sandy silt; light olive gray to light gray in color. A 2" thick sand and gravel seam occurs at 47'. Wet.	218.9
							SW GW	(48–51') Sand and gravel; sand is very coarse-grained and gravel is up to 3" in longest dimension. Moderate yellowish-brown mottled with light gray, wet.	213.9
55							CL SP	Clay seams near 51'.	212.9
60								(51–54.5') Sand is now medium to coarse-grained and gravel is up to 2.5" in longest dimension. Moderate yellowish brown, wet.	
65								(54–55') Cockfield Formation: Silty clay with very fine-grained sand. Dusky yellowish-brown to moderate yellowish-brown. Lignitic material at top.	
70								Terminated soil boring at 55'.	
75									
80									

WELL DIAGRAM



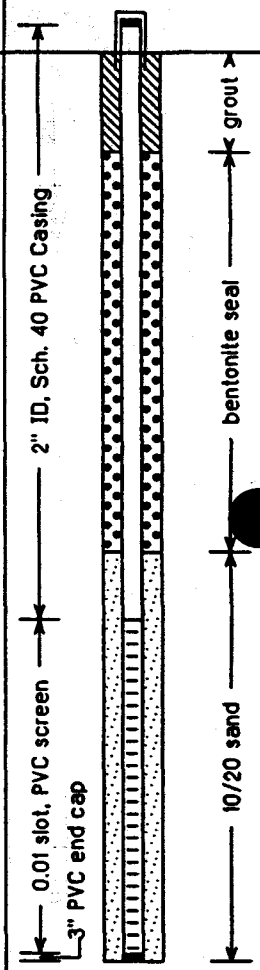
EnSafe/Allen & Hoshall

Monitoring Well 002G06UA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.82 feet msl*
Started at *1350 on 2-2-96*	TOC Elevation: *269.61 feet msl*
Completed at *1515 on 2-2-96*	Depth to Groundwater: *16.74 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *252.87 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1				OL GP	(0-27') Upper Alluvium (see descriptions below). (0-.5) Soil, gravel, and asphalt.	
5							ML	(.5-15') Silt, mostly moderate yellowish-brown to light olive gray. (.5-6') Silt; moderate yellowish-brown mottled with light olive gray material. Some iron staining and rare iron-manganese nodules.	
10		◢	2					(6-14') Percentage of light olive gray-colored material decreases down to 14'.	
15		◢	3					(14-15') Becoming mostly light olive gray to greenish-gray mottled with moderate yellowish-brown. Abundant iron staining and iron- manganese nodules just above 15'.	252.8
							ML	(15-19') Silt, olive gray to dark greenish-gray. Wet from 16-19'.	248.8
20							ML	(19-25') Silt, dark greenish-gray mottled with brownish-gray material. Some snail shell fragments present.	
25								Some iron/manganese nodules at 24'. Wood at 25'.	242.8
							ML	(25-27') Silt, olive gray to greenish-gray in color. Rare snail shell fragments and wet below 26'.	240.8
30								Soil boring terminated at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G06DA.	
35									
40									

WELL DIAGRAM



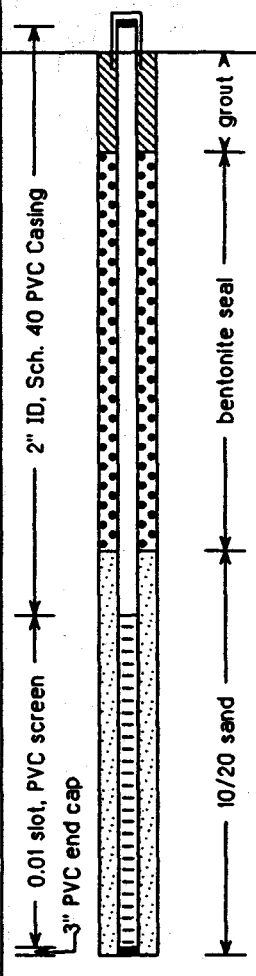
EnSafe/Allen & Hoshall

Monitoring Well 002G07UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *266.10 feet msl*
Started at *1405 on 2-1-96*	TOC Elevation: *268.21 feet msl*
Completed at *1530 on 2-1-96*	Depth to Groundwater: *15.56 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *252.65 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1				OL GP	(0-4') Soil, gravel, and asphalt.	262.1
5							ML	(4-15') Silt, moderate yellowish-brown mottled with light olive gray and olive gray. (4-10') Silt, moderate yellowish-brown mottled with light olive gray, with iron-manganese nodules.	
		■	2						
10								(10-15') Clayey silt, moderate yellowish-brown mottled with olive gray, becoming moist near 15'.	
15		■	3					No recovery from 15' to 16'. No description available; collected a Shelby tube sample from 16' to 19'.	251.1
20							CL ML	(19-24') Clay and silt, olive gray to greenish-gray, wet.	247.1
									242.1
25							SW ML	(24-27') Fluvial Deposits (see descriptions below).	241.1
							ML SP	(24-25') Sand, fine to medium-grained, and silt, olive gray to greenish-gray, with snail shell fragments, wet.	239.1
30								(25-27') Silt and sand, very fine-grained, olive-gray to greenish- gray, with snail shell fragments, moist.	
35								Terminated soil boring at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent soil boring 002S0030DA.	
40									

WELL DIAGRAM



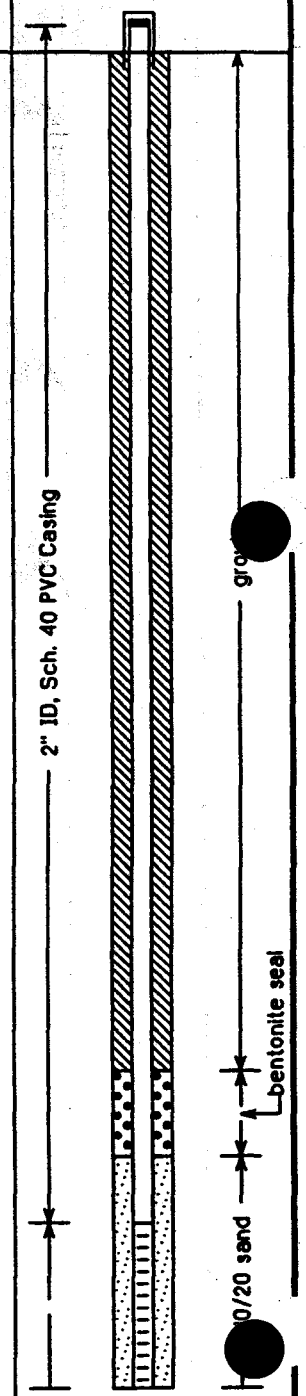
EnSafe/Allen & Hoshall

Monitoring Well 002G08DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.10 feet msl*
Started at *0930 on 1-31-96*	TOC Elevation: *269.33 feet msl*
Completed at *1425 on 1-31-96*	Depth to Groundwater: *17.54 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *251.79 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *51.5 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *35 to 45 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		OL GP	(0-22') Upper Alluvium (see descriptions below).	266.1
			1	100	BG		CL ML	(0-.5') Concrete.	
								(.5-1') Soil and gravel.	263.1
5					BG			(1-4') Silt and clay.	
					BG			(1-2') Clayey silt, light olive gray to greenish-gray and mottled with moderate yellowish-brown material.	
					BG			(2-4') Silty clay; dark greenish-gray.	
10			2	53	BG		ML	(4-18') Silt, clayey (see descriptions below).	
					BG			(4-5') Clayey silt, light olive gray mottled with moderate yellowish- brown material.	
15					BG			(5-15') Moderate yellowish-brown mottled with olive gray material. Contains iron-manganese nodules from 5' to 18'.	
					BG			Becoming moist; more clay-rich with less olive gray-colored material from 14-18'.	249.1
20			3	90	BG			(18-29') Silt and very fine-grained sand. Olive gray to greenish-gray in color. Contains snail shell fragments. Top of Deeper Alluvium deposits estimated at 22'.	
					BG		ML SP	Sand, jelly-like, lighter in color, wet at 22'.	
25					BG			Wood fragments scattered throughout from 24' to 41'.	
			4	96	BG				
					BG				238.1
30					BG		SW ML	(29-33') Silt and sand; sand is fine to coarse-grained.	
			4	96	BG			Olive gray to greenish-gray with snail shell fragments, wood scattered throughout, wet.	234.1
35					BG		SW ML	(33-39') Sand, fine to very coarse-grained, and silt, olive gray to greenish-gray, with snail shell fragments, wood scattered throughout, wet.	
					BG				228.1
40			5	100			SW ML		

WELL DIAGRAM



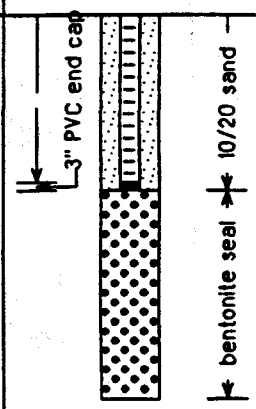
EnSafe/Allen & Hoshall

Monitoring Well 002G08DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.10 feet msl*
Started at *0930 on 1-31-96*	TOC Elevation: *269.33 feet msl*
Completed at *1425 on 1-31-96*	Depth to Groundwater: *17.54 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *251.79 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *51.5 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *35 to 45 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		SW	(39-41') Sand, fine to coarse-grained, and silt, olive gray to greenish-gray, with snail shell fragments, with wood scattered throughout, wet.	226.1
							ML		225.1
							SM		224.1
					BG		SP GW	(41-42') Sand, fine to coarse-grained, and silt with gravel up to 2.5" in longest dimension. Olive gray to greenish-gray, wet.	
45					BG		SP GW		222.1
					BG		CL	(42-43') Very coarse-grained sand and gravel up to 2"in longest dimension. Moderate yellowish-brown, wet.	
50			6	75	BG			(43-45') Gravel up to 2" in longest dimension, and sand, very coarse, very light gray mottled with moderate yellowish-brown, wet.	
					BG				215.6
55								(45-51.5') Cockfield Formation: Clay, dusky to dark yellowish-brown with light olive gray fine-grained sand laminations. Becoming very sandy near base of soil boring; sand is fine to medium-grained and light olive gray in color.	
60								Terminated soil boring at 51.5'.	
65									
70									
75									
80									

WELL DIAGRAM



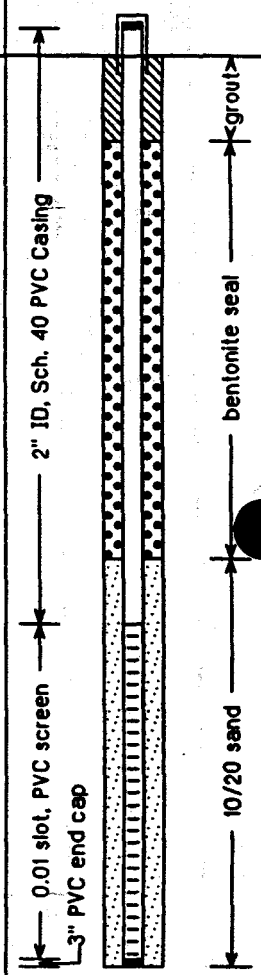
EnSafe/Allen & Hoshall

Monitoring Well 002G08UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.05 feet msl*
Started at *0800 on 2-1-96*	TOC Elevation: *269.37 feet msl*
Completed at *1010 on 2-1-96*	Depth to Groundwater: *17.34 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *252.03 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL GP	(0-27') Upper Alluvium (see descriptions below).	266
							CL ML	(0-.5') Concrete.	
			1					(.5-1') Soil and gravel.	263
5								(1-4') Silt and clay.	
								(1-2') Clayey silt; light olive gray to greenish-gray and mottled with moderate yellowish-brown material.	
			2					(2-4') Silty clay; dark greenish-gray.	
10							ML	(4-18') Silt, clayey (see descriptions below).	
								(4-5') Clayey silt, light olive gray mottled with moderate yellowish- brown material.	
15			3					(5-15') Moderate yellowish-brown mottled with olive gray material, contains iron-manganese nodules.	
								Becoming moist; more clay-rich with less olive gray-colored material from 14-18'.	249
20							ML SP	(18-27') Silt and very fine-grained sand. Olive gray to greenish-gray in color. Contains snail shell fragments. Top of Fluvial Deposits estimated at 22'.	
								Sand, jelly-like, lighter in color, wet at 27'.	
25								Wood fragments scattered throughout from 24' to 27'.	
								Terminated soil boring at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G08DA.	240
30									
35									
40									

WELL DIAGRAM



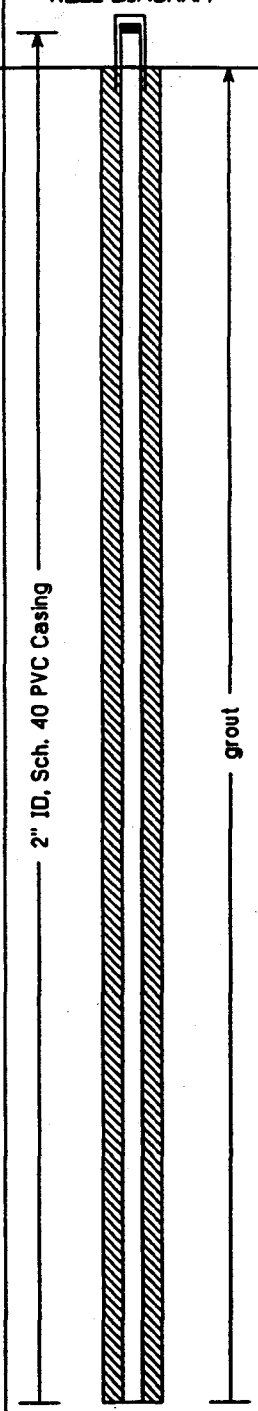
EnSafe/Allen & Hoshall

Monitoring Well 002G09DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *265.51 feet msl*
Started at *0830 on 1-30-96*	TOC Elevation: *267.96 feet msl*
Completed at *0945 on 1-30-96*	Depth to Groundwater: *17.15 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *250.81 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	75	8, 6		OL GW	(0-26') Upper Alluvium (see descriptions below). (0-3.5') Soil and gravel (fill).	262
5					5, 6		ML	(3.5-8') Clayey silt; moderate yellowish-brown mottled with light olive gray material containing iron-manganese nodules.	257.5
10			2	98	5, 6, 6, 4, 5, 2		ML	(8-19') Silt, very clayey, moderate yellowish-brown to dark yellowish- brown mottled with medium gray material. Abundant iron-manganese nodules from 9' to 11'. Moist with some iron-manganese nodules from 13' to 15'. Less iron-manganese nodules, becoming more dark yellowish-orange from 15-19'.	246.5
15									
20			3	90	5, 6		ML	(19-23') Silt, clayey (see descriptions below). (19-22') Silt, clayey, olive gray to greenish-gray, containing snail shell fragments. (22-23') Same as above, but olive gray in color.	242.5
25			4	100	6, 5		SM SW	(23-27.5') Sand, fine to medium, silty, olive gray in color, with snail shell fragments, moist to wet, wet below 25'. Top of Deeper Alluvium deposits estimated at 26'. (27.5-28') Sand, fine to very coarse-grained, olive gray, with snail shell fragments, wet.	237.5
30					5		ML	(28-31') Silt; olive gray in color with snail shell fragments. Wet. Vegetation near 29'.	

WELL DIAGRAM



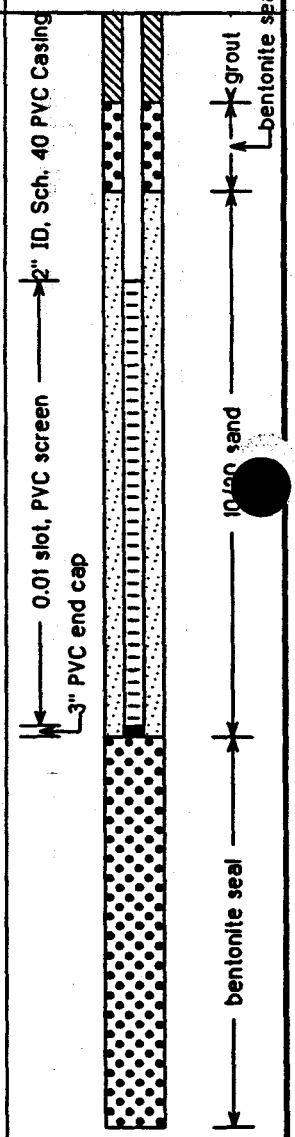
EnSafe/Allen & Hoshall

Monitoring Well 002G09DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *265.51 feet msl*
Started at *0830 on 1-30-96*	TOC Elevation: *267.96 feet msl*
Completed at *0945 on 1-30-96*	Depth to Groundwater: *17.15 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *250.81 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55.0 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML		234.5
					3		SM	(31–34') Silty sand, very fine-grained becoming progressively coarser near 34', olive gray to light olive gray near 34', with snail shell fragments, wet.	231.5
			4	100	8				
							SW	(34–34.5') Coarse to very coarse-grained sand with gravel. Light olive gray to greenish-gray, containing snail shell fragments, wet.	231
35					6		SW		230.5
					6		SM	(34.5–35') Sand, very fine to medium-grained, light olive gray to greenish-gray, wet.	
					7		SP/GW	(35–38') Silty sand, very fine to very coarse-grained, with quartz and chert gravel up to 1" in longest dimension, olive gray, wet.	227.5
40			5	390	5			(38–43') Sand and gravel; sand is fine to very coarse-grained, gravel is up to 1"in longest dimension; moderate yellowish-brown mottled with light gray material, wet.	
					6		SP	(43–44') Coarse-grained sand, moderate yellowish-brown mottled with medium light gray material, wet.	222.5
45					6		SW/GW		221.5
					5		CL	(44–46') Sand and gravel, gravel and sand (see descriptions below).	219.5
					5			(44–45') Sand and gravel; sand is very coarse-grained and gravel is up to 1.5" in longest dimension; moderate yellowish-brown mottled with medium light gray material, wet.	
50			6	102	6			(45–46') Gravel up to 1.5" in longest dimension, and sand, dark yellowish-brown to moderate yellowish-brown; becoming clayey near 46'.	
					5			(46–55') Cockfield Formation: Clay, dusky yellowish-brown to dark yellowish-brown.	
					5			With light olive gray sandy seams below 52'.	
55								With some lignite seams below 53'.	210.5
								Terminated soil boring at 55'.	
60									

WELL DIAGRAM



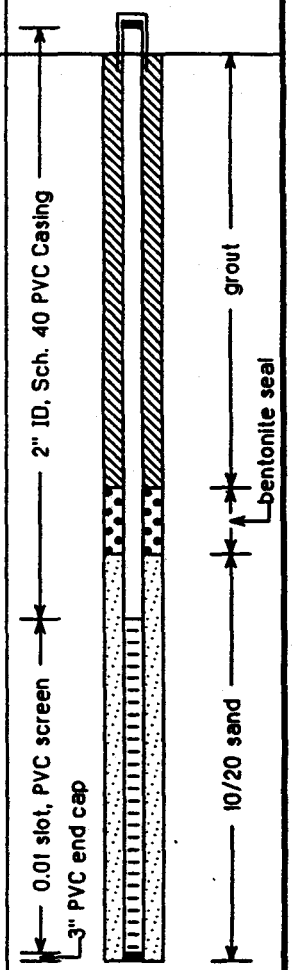
EnSafe/Allen & Hoshall

Monitoring Well 002G09UA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *265.68 feet msl*
Started at *1320 on 1-30-96*	TOC Elevation: *268.09 feet msl*
Completed at *1500 on 1-30-96*	Depth to Groundwater: *16.19 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *251.90 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1				OL GW	(0-26') Upper Alluvium (see descriptions below). (0-3.5') Soil and gravel (fill).	262.2
5							ML	(3.5-8') Clayey silt; moderate yellowish-brown mottled with light olive gray material containing iron-manganese nodules.	257.7
10		◢	2				ML	(8-19') Silt, very clayey, moderate yellowish-brown to dark yellowish- brown mottled with medium gray material. Abundant iron-manganese nodules from 9' to 11'. Moist with some iron-manganese nodules from 13' to 15'. Less iron-manganese nodules, becoming more dark yellowish-orange from 15-19'.	
15		◢	3						246.7
20							ML	(19-23') Silt, clayey, olive gray to greenish-gray, becoming just olive gray from 22' to 23', containing snail shell fragments.	242.7
25							SM	(23-27') Silty sand; fine to medium-grained, olive gray in color, with snail shell fragments, moist to wet. Top of Deeper Alluvium deposits estimated at 26'. Wet below 25'.	238.7
30								Terminated soil boring at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G09DA.	
35									
40									

WELL DIAGRAM



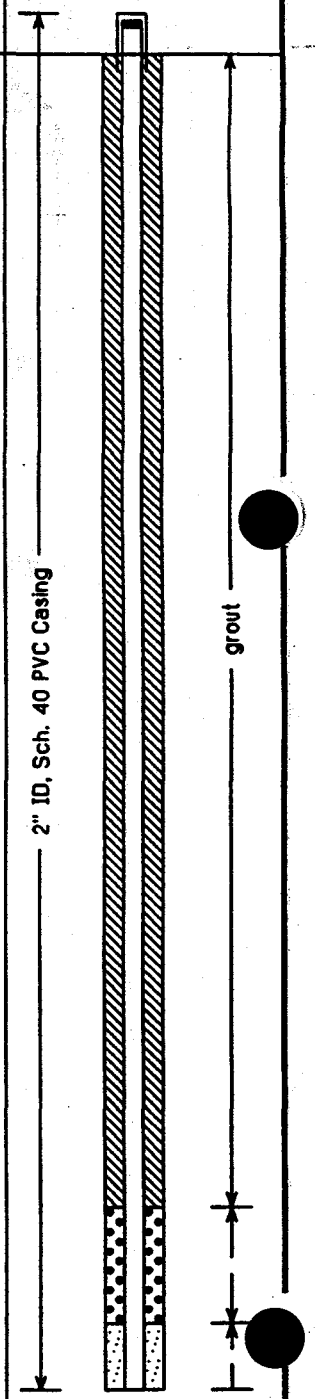
EnSafe/Allen & Hoshall

Monitoring Well 002G10DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *270.36 feet msl*
Started at *1220 on 2-12-96*	TOC Elevation: *270.17 feet msl*
Completed at *1400 on 2-12-96*	Depth to Groundwater: *9.36 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *260.81 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					4			(0-36') Upper Alluvium (see descriptions below).	
			1	67	4			Silt and clay (fill material) from 0' to 6', moderate brown to moderate gray in color.	
5					2				
					3			Moderate gray to light yellowish-brown, slightly moist.	264.4
					3				
10			2	35	3		ML CL		
					3			Mottling with dark yellowish-orange material with some organic material from 13' to 16'.	
15					3				254.4
					4			Silt, moderate brown to light gray with dark orangish-yellow mottling from 16' to 25'. Organic material present. Moist.	
					3				
20			3	90	3			Wet at 20'.	
					3				
25					3			Color change at 25' to light greenish-gray to olive gray. Shell fragments present. Wet.	
					2		ML	Silt with minor clay and sand. Moderate greenish-gray with common snail shells. Wet.	
			4	100	2				
30					2				
			4	100	2				
					2				
35					3				234.4
					2		SW SM	(36-50') Deeper Alluvium (see descriptions below).	
40					2				

WELL DIAGRAM



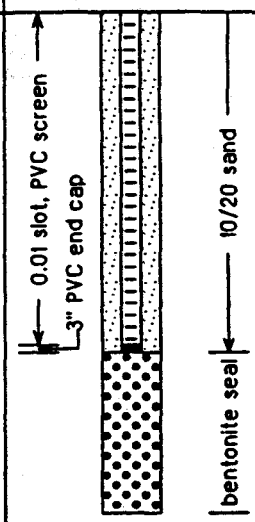
EnSafe/Allen & Hoshall

Monitoring Well 002G10DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *270.36 feet msl*
Started at *1220 on 2-12-96*	TOC Elevation: *270.17 feet msl*
Completed at *1400 on 2-12-96*	Depth to Groundwater: *9.36 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *260.81 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	85	2		SW SM	(36-45') Sand with gravel. Silt seams from 38-42', with thicknesses ranging from 6 to 12 inches. Sand is brownish-gray to light yellowish-brown.	
					2				
45					2		GC GM	Gravel in a silt and clay matrix with minor sand. Very hard, dry to moist.	225.4
					3		SW GW	Sand and gravel, light yellowish-brown to light yellowish gray.	224.4
					2			Color change to dark orangish-yellow.	
50			6	120	2		CL ML	Cockfield Formation: Dark brownish-gray clay with interbeds of silt and fine sand. Fine to medium-grained sand lense at 55'.	220.4
					2				
55					2				
								Terminated soil boring at 56'. Note: PID response likely due to moisture in samples.	214.4
60									
65									
70									
75									
80									

WELL DIAGRAM



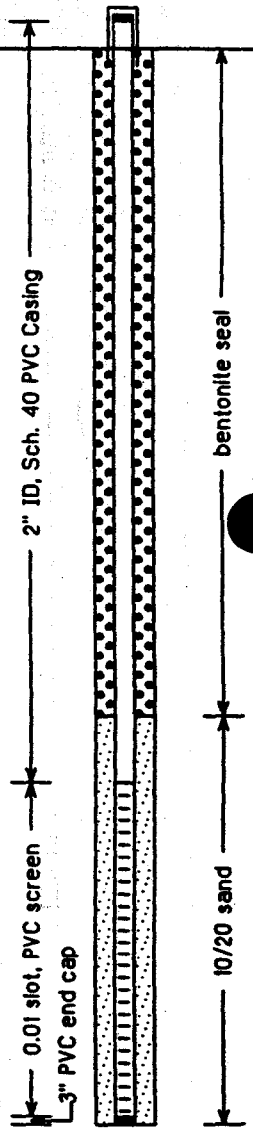
EnSafe/Allen & Hoshall

Monitoring Well 002G10UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *270.36 feet msl*
Started at *1400 on 2-13-96*	TOC Elevation: *270.19 feet msl*
Completed at *1445 on 2-13-96*	Depth to Groundwater: *8.79 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *261.40 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *32.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *22 to 32 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1					(0-32') Upper Alluvium (see descriptions below). Silt and clay (fill material) from 0' to 6', moderate brown to moderate gray color.	
5									
							ML CL	Moderate gray to light yellowish-brown, slightly moist.	264.4
10									
		■	2					Mottling with dark yellowish-orange material with some organic material from 13' to 16'.	
15									254.4
								Silt, moderate brown to light gray with dark orangish-yellow mottling from 16' to 25'. Organic material present. Moist. Becomes wet at 20'.	
20		■	3						
25							ML	Color change at 25' to light greenish-gray and olive gray. Shell fragments present. Wet. Silt with minor clay and sand. Moderate greenish-gray with common snail shells. Wet.	
30									238.4
								Terminated soil boring at 32'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G10DA.	
35									
40									

WELL DIAGRAM



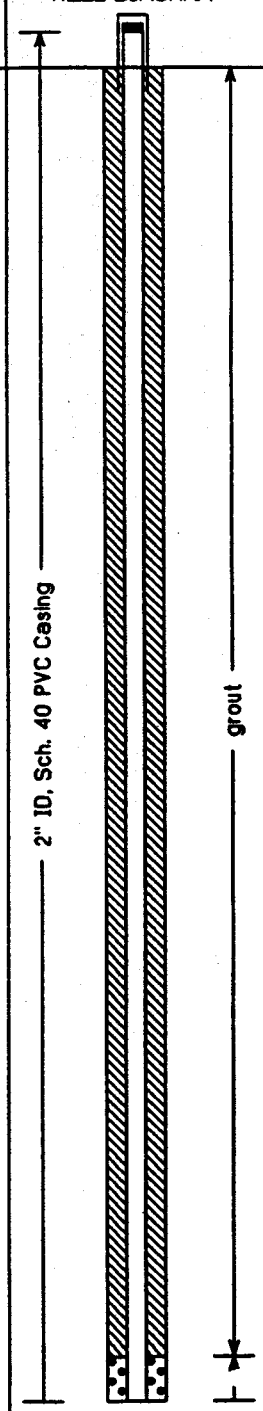
EnSafe/Allen & Hoshall

Monitoring Well 002G11DA

Project: *NSA Memphis*	Location: *Millington, TN. SHMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *265.17 feet msl*
Started at *1010 on 1-16-96*	TOC Elevation: *266.77 feet msl*
Completed at *0915 on 1-17-96*	Depth to Groundwater: *4.17 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger, 5' Flights*	Groundwater Elevation: *262.60 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *46.0 feet*
Geologist: *J. Carmichael, W. Parks, D. Ladd*	Well Screen: *32.2 to 42.2 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	42	BG			(0-33') Upper Alluvium (see descriptions below).	264.2
								(0-1') Fill and skeet fragments.	
			2	71	BG			(1-24') Silt, clayey (see descriptions below).	
								(1-2') Clayey silt, yellowish-brown to brownish-gray in color.	
5			3	73	BG			(2-6') Silt, clayey, dark yellowish-brown with dark yellowish-orange staining. Trace of organic material.	
			4	83	BG			Finely laminated and contains small iron-manganese nodules from 4-6'.	
			5	96	BG			(6-8') Silt, decreasing clay content and increasing iron-manganese nodule content. Yellowish-brown to light olive gray, moist.	
10			6	100	BG			(8-18') Silt, slightly clayey yellowish-gray to light olive gray color, moist.	
			7	100	BG		ML	Increase in dark yellowish-orange staining, moisture content, and iron-manganese content from 10-14'.	
15			8	100	BG			Stained dark yellowish-orange in color from 14-16'. Very moist from 14-15'.	
			9	100	BG			Less staining from 16-18'. Very moist from 16' to 17' (water came up the borehole when auger was advanced).	
			10	92	BG			(18-19') Silt, slightly clayey, medium gray in color. Moist.	
20			11	83	BG			(19-20') Silt, slightly clayey, yellowish-gray to light olive gray, moist.	
			12	100	BG			(20-22') Silt, slightly clayey, medium light gray to light gray, stained moderate brown, moist.	
								(22-24') Silt, clayey, pale yellowish-brown to pale brown color, moist.	241.2
25			13	100	BG			(24-28') Silt (see descriptions below).	
			14	100	BG		ML	(24-26') Silt; medium gray to brownish-gray with patches of dark yellowish-orange material. Moist.	237.2
			15	100	BG		ML	(26-28') Silt; light olive gray to medium gray. Slightly moist.	
30								(28-33') Silt, sandy (see descriptions below).	

WELL DIAGRAM



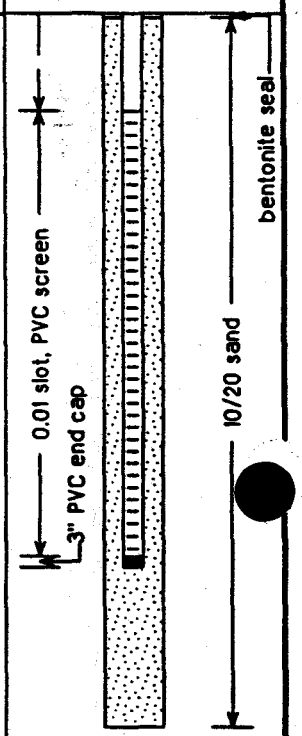
EnSafe/Allen & Hoshall

Monitoring Well 002G11DA

Project: NSA Memphis	Location: Millington, TN. SWMU#2 – Southside Landfill
Project No.: 106-08420	Surface Elevation: 265.17 feet msl
Started at 1010 on 1-16-96	TOC Elevation: 266.77 feet msl
Completed at 0915 on 1-17-96	Depth to Groundwater: 4.17 feet Measured: 4/8/96
Drilling Method: 4 1/4" ID Hollow-Stem Auger, 5' Flights	Groundwater Elevation: 262.60 feet msl
Drilling Company: Alliance Environmental, Inc.	Total Depth: 46.0 feet
Geologist: J. Carmichael, W. Parks, D. Ladd	Well Screen: 32.2 to 42.2 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			16	100	BG		ML	(28-30') Sandy silt; light olive gray to medium gray in color, slightly moist.	
			17	100	BG			(30-32') Silt, sandy, light olive gray, slightly moist, contains pockets of small red carbonaceous material.	232.2
35			18	71	BG			(32-33') Silt, sandy, medium light gray to medium gray, moist.	
			19	92	BG			(33-43') Deeper Alluvium (see descriptions below).	
			20	58	BG		SW GW	(33-34') Sand, fine to coarse-grained, light olive gray color, wet.	
40			21	88	BG			(34-36.25') Sand, fine to coarse-grained, with clay, silt, and gravel up to .5" in longest dimension. Light brownish-gray to pale red, moist. Coantains silt and clay from 34-35'.	
			22	92	BG			(36.25-38') Clayey sand with gravel up to 1" in longest dimension, olive gray to medium gray, moist.	222.2
45			23	83	BG		CL	(38-40') Sand and gravel, light olive gray to pale brown. Gravel content increases with depth.	
								(40-42') Sand and gravel, olive gray to brownish-gray stained dark yellowish-orange, wet.	219.2
								(42-43') Sand and gravel, light olive gray, wet.	
50								(43-46') Cockfield Formation: Clay, brownish-gray to dusky brown, finely micaceous, with fine-grained sand laminae from 44' to 46'.	
								Terminated soil boring at 46'.	
55									
60									

WELL DIAGRAM



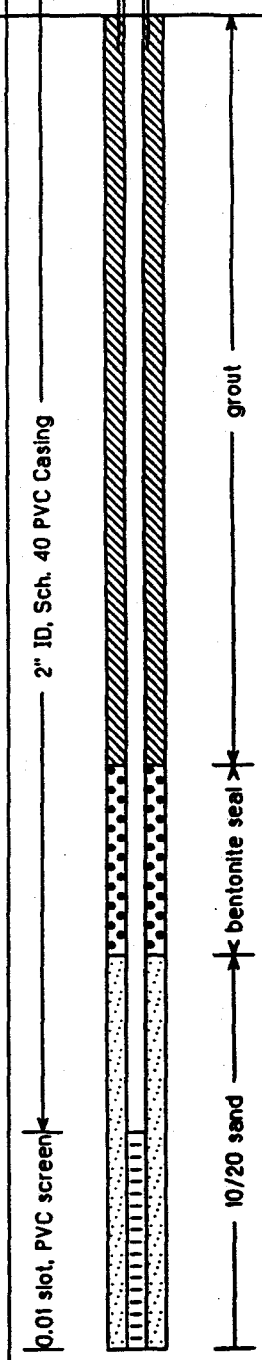
EnSafe/Allen & Hoshall

Monitoring Well 002G11UA

Project: NSA Memphis	Location: Millington, TN. SWMU#2 - Southside Landfill
Project No.: 106-08420	Surface Elevation: 265.12 feet msl
Started at 1500 on 1-17-96	TOC Elevation: 266.91 feet msl
Completed at 1300 on 1-18-96	Depth to Groundwater: 3.92 feet Measured: 4/8/96
Drilling Method: 4 1/4" ID Hollow-Stem Auger with 5' Flights	Groundwater Elevation: 262.99 feet msl
Drilling Company: Alliance Environmental, Inc.	Total Depth: 26.75 feet
Geologist: J. Carmichael, W. Parks, D. Ladd	Well Screen: 16.75 to 26.75 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1					(0-27') Upper Alluvium (see descriptions below).	
								(0-1') Fill and skeet fragments.	264.1
								(1-24') Silt, clayey (see descriptions below).	
								(1-2') Clayey silt; yellowish-brown to brownish-gray in color.	
								(2-6') Silt, clayey, dark yellowish-brown with dark yellowish-orange staining. Trace of organic material.	
5								Finely laminated and contains small iron-manganese nodules from 4-6'.	
								(6-8') Silt, decreasing clay content and increasing iron-manganese nodule content. Yellowish-brown to light olive gray color, moist.	
			2					(8-18') Silt, slightly clayey, yellowish-gray to light olive gray color, moist.	
10							ML	Increase in dark yellowish-orange staining, moisture content, and iron-manganese content from 10-14'.	
			3					Stained dark yellowish-orange in color from 14-16'. Very moist from 14-15'.	
15								Less staining from 16-18'. Very moist from 16-17' (water came up the borehole when auger was advanced).	
								(18-19') Silt, slightly clayey, medium gray in color. Moist.	
								(19-20') Silt, slightly clayey, yellowish-gray to light olive gray, moist.	
20									

WELL DIAGRAM



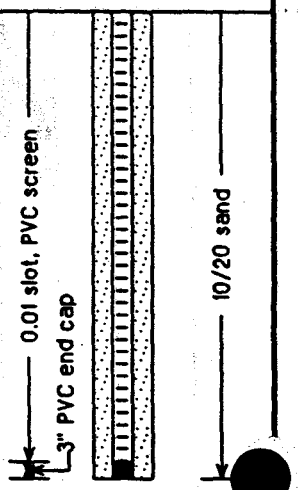
EnSafe/Allen & Hoshall

Monitoring Well 002G11UA

Project: NSA Memphis	Location: Millington, TN SWMU#2 - Southside Landfill
Project No.: 106-08420	Surface Elevation: 265.12 feet msl
Started at 1500 on 1-17-96	TOC Elevation: 266.91 feet msl
Completed at 1300 on 1-18-96	Depth to Groundwater: 3.92 feet Measured: 4/8/96
Drilling Method: 4 1/4" ID Hollow-Stem Auger with 5' Flights	Groundwater Elevation: 262.99 feet msl
Drilling Company: Alliance Environmental, Inc.	Total Depth: 26.75 feet
Geologist: J. Carmichael, W. Parks, D. Ladd	Well Screen: 16.75 to 26.75 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	(20-22') Silt, slightly clayey, medium light gray to light gray, stained moderate brown. Moist. (22-24') Clayey silt, pale yellowish-brown to pale brown in color. Moist.	241.1
25							ML	(24-27') Silt (see descriptions below). (24-26') Silt; medium gray to brownish-gray with patches of dark yellowish-orange material. Moist. (26-27') Silt, light olive gray to medium gray, slightly moist.	238.1
30								Soil boring terminated at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G11DA.	
35									
40									

WELL DIAGRAM



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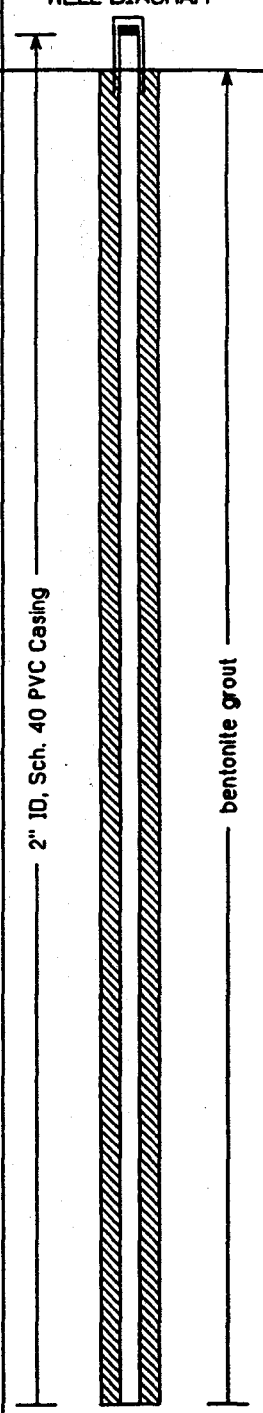
Monitoring Well 002G12DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *268.56 feet msl*
Started at *1300 on 1-29-96*	TOC Elevation: *268.63 feet msl*
Completed at *1400 on 1-30-96*	Depth to Groundwater: *6.02 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *262.61 feet msl*
Drilling Company: *Alliance Drilling*	Total Depth: *50.0 feet*
Geologist: *J. Kingsbury, R. Thomas*	Well Screen: *38.5 to 48.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-35') Upper Alluvium (see descriptions below).	
		■						Silt and clay; light brown to dark yellowish-brown color from 0'-2'.	
								Light brown to yellowish-brown color. Many small iron-manganese nodules. Staining with orange rust-colored material. Dry.	
5								Grayish-brown to light brown color, stained dark orange to rust- colored. Iron-manganese nodules common. Dry.	
								Dry to slightly moist.	
		■						Fewer iron-manganese nodules, very slightly moist.	
10								Increase in percentage of iron-manganese nodules; increase in moisture content from 11.5' to 12.0'.	
								Yellowish-brown to light olive gray color. Decreased staining and percentage of iron-manganese nodules. Moist.	
							ML CL		
15		■						Medium yellowish-brown to light olive gray, moist.	
								Silt and clay, moist. Increased staining.	
								Light olive gray.	
								Color change to medium gray at 18.5'. Some staining with black material (iron/manganese or organics).	
20									
								Decreased moisture content.	
25								Clay and silt; greenish-gray, dry.	
									238.6
30			1	75	BG		ML	Clayey silt, light olive gray to medium gray color. Some orangish- brown staining. Mostly dry.	

WELL DIAGRAM



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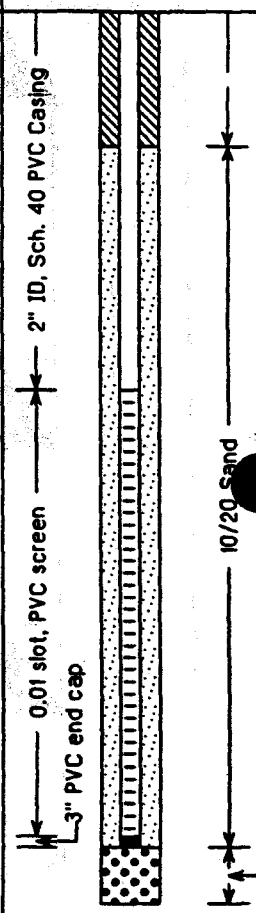
Monitoring Well 002G12DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *266.56 feet msl*
Started at *1300 on 1-29-96*	TOC Elevation: *268.63 feet msl*
Completed at *1400 on 1-30-96*	Depth to Groundwater: *6.02 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *262.61 feet msl*
Drilling Company: *Alliance Drilling*	Total Depth: *50.0 feet*
Geologist: *J. Kingsbury, R. Thomas*	Well Screen: *38.5 to 48.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			2	75	BG		ML	Contains streaks of fine to medium-grained sand approximately 1 to 2 inches thick, light olive-gray to medium gray.	
			3	83	BG				
							SC SM	Silt, sand, and clay, light olive gray.	232.6
35			4	100	BG		SW	(35-51') Deeper Alluvium (see descriptions below).	231.6
								(35-36') Sand; fine to coarse-grained, yellowish-gray to yellowish- brown color.	230.6
								Start five-foot split-spoon intervals.	
40			5	67	BG		SW GW	Sand and gravel; gravel up to 1" in diameter. Yellowish-gray to yellowish-brown in color.	226.6
									224.6
45			6	83	BG		SW GW	Sand and gravel, yellowish-brown to yellowish-gray.	221.6
									219.6
50			7	75	BG		SW	Sand with rare gravel, light olive gray, matrix resembles reworked Cockfield Formation from 50' to 51'. Cockfield Formation contact is at 51'.	216.6
							SC SM	Sand, fine to medium-grained, finely lignitic and micaceous, is present from 51' to 51.5'.	215.6
								Sand with silt and clay.	
55								Terminated soil boring at 51.5'. Note: Sample lithology and PID readings from 0' to 28' obtained during the advancement of 002G12UA. Lithology and PID readings from 28' to 51.5' obtained during the advancement of 002G12DA.	
60									

WELL DIAGRAM



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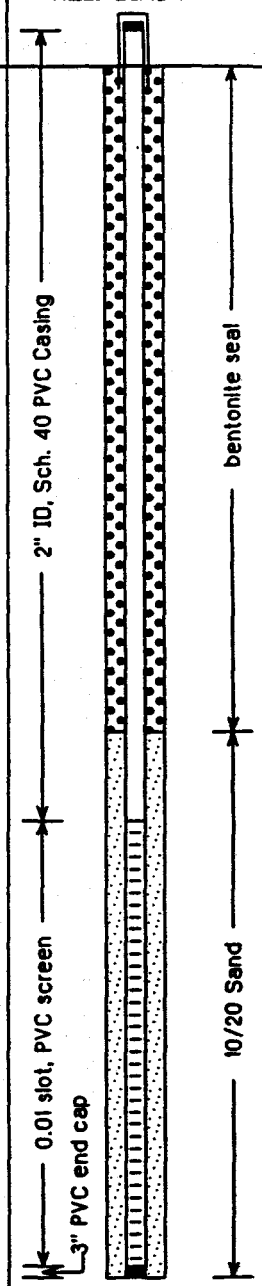
Monitoring Well 002G12UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *266.64 feet msl*
Started at *1030 on 1-23-96*	TOC Elevation: *268.63 feet msl*
Completed at *1200 on 1-29-96*	Depth to Groundwater: *12.87 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger with 5' Flights*	Groundwater Elevation: *255.76 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *28.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1	58	4			(0-28') Upper Alluvium (see descriptions below).	
								Silt and clay; light brown to dark yellowish-brown color from 0'-2'.	
			2	75	6			Light brown to yellowish-brown color. Many small iron-manganese nodules. Staining with orange rust-colored material. Dry.	
5			3	50	5			Grayish-brown to light brown color, stained dark orange to rust- colored. Iron-manganese nodules common. Dry.	
			4	75	4			Slightly moist.	
		■	5	100	3			Fewer iron-manganese nodules, very slightly moist.	
10			6	92	3			Increase in percentage of iron-manganese nodules; increase in moisture content from 11.5' to 12'.	
			7	92	3		ML CL	Yellowish-brown to light olive gray color. Decreased staining and percentage of iron-manganese nodules. Moist.	
15		■	8	96	3			Medium yellowish-brown to light olive gray, moist.	
			9	92	3			Silt and clay, moist. Increased staining.	
								Light olive gray.	
			10	100	4			Color change to medium gray at 18.5'. Some staining with black material (iron/manganese or organics).	
20			11	100	4				
			12	100	3				
								Decreased moisture content.	
25			13	100	4				
								Clay and silt; greenish-gray, dry.	
			14	100	4				
								Terminated soil boring at 28'. Note: PID response likely due to moisture content of soil.	238.6
30									

WELL DIAGRAM



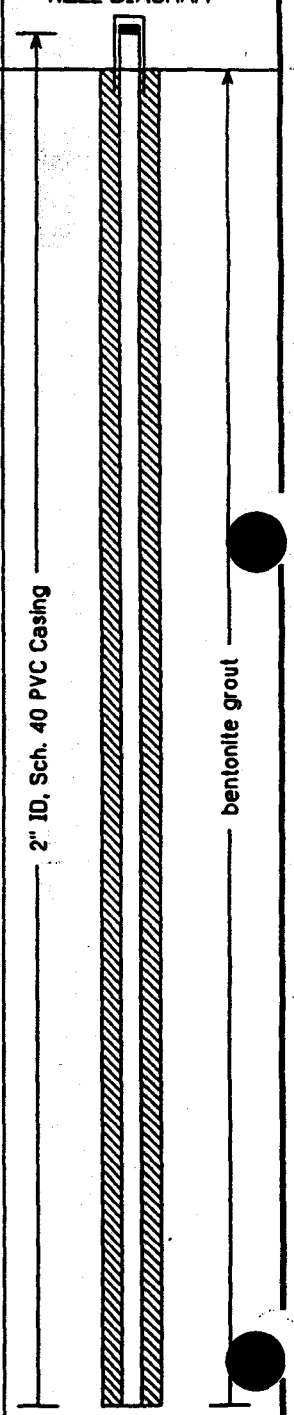
EnSafe/Allen & Hoshall

Monitoring Well 002G13DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.05 feet msl*
Started at *1110 on 1-19-96*	TOC Elevation: *269.12 feet msl*
Completed at *1130 on 1-20-96*	Depth to Groundwater: *5.36 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger, 5' Flights*	Groundwater Elevation: *263.76 feet msl*
Drilling Company: *Alliance Drilling*	Total Depth: *67.0 feet*
Geologist: *D. Ladd, J. Kingsbury, A. Choate*	Well Screen: *55 to 65 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	46	BG		OL	(0-34') Upper Alluvium (see descriptions below).	
			2	83	BG		CL ML	Clay and silt, dark yellowish-brown, moist, with organic material and roots.	265
5			3	88	3			Silty clay/clayey silt, greenish-gray and moderate yellowish-brown, slightly moist, soft to slightly firm, with some dark iron staining.	263
			4	79	2.5			Clayey silt, greenish-gray and moderate yellowish-brown, with iron/ manganese inclusions and organic material, slightly moist.	
			5	100	2			Iron-manganese nodules increasing in percentage and size (up to .5" in diameter).	
10			6	108	BG		ML	Some staining with a dark yellowish-orange material. Increase in clay percentage.	
			7	108	BG			Clayey silt, light olive gray color stained light brown to dark yellowish-orange. Moisture content increasing as iron/manganese nodules decrease in percentage.	
15			8	108	BG			Very moist at 14' becoming less moist near 16', rare iron/manganese nodules.	
			9	108	BG			Clayey silt, medium gray to light olive gray stained light brown to dark yellowish-orange, very moist.	
			10	100	BG			Silty clay, medium light to medium gray, wet.	248
20			11	92	BG			Dark greenish-gray to grayish-olive green color, wet.	
			12	100	BG		CL	Very moist.	
25			13	96	BG			Light olive gray to grayish-olive green color. Very moist and soft.	
			14	96	BG				
			15	96	BG		ML	Clayey silt, light olive gray to grayish-olive green color, slightly moist, soft.	239
30									

WELL DIAGRAM



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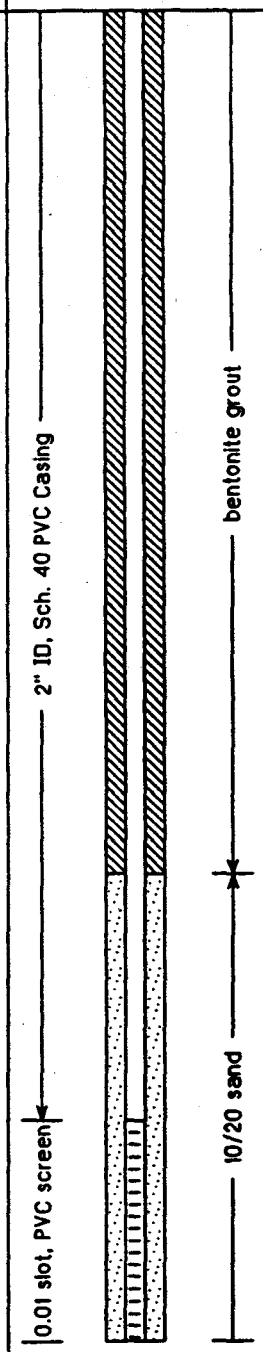
Monitoring Well 002G13DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.05 feet msl*
Started at *1110 on 1-19-96*	TOC Elevation: *269.12 feet msl*
Completed at *1130 on 1-20-96*	Depth to Groundwater: *5.36 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger, 5' Flights*	Groundwater Elevation: *263.76 feet msl*
Drilling Company: *Alliance Drilling*	Total Depth: *67.0 feet*
Geologist: *D. Ladd, J. Kingsbury, A. Choate*	Well Screen: *55 to 65 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			16	33	BG			Sandy silt with rare coarse subangular sand grains. Wet.	
			17	83	BG		ML	Olive gray color, wet, soft.	
35			18	79	BG			Sandy silt with fine to coarse sand between 34' and 35' fining downward to fine-grained sand between 35' and 36', soft. Top of Deeper Alluvium deposits estimated at 34'.	230.9
			19	100	BG		SW GW	Sand and gravel, gravel up to 1" in longest dimension, light olive gray.	229.5
			20	100	BG		SW	Silty sand, light olive gray. Silty sand with some gravel, light olive gray to light gray.	227
40								No sample collected from 40' to 46' due to heaving sand.	
45									221
			21	96	BG		SW GW	Sand and gravel, light olive gray. Wet. Considerable iron-staining at 47.5'.	219
								No sample collected from 48' to 51'.	
50									216
			22	100	BG		SW GW	Sand and gravel, dark yellowish-orange changing to yellowish-gray color near 53'.	214
								No sample collected from 53' to 56'.	
55									211
			23	100	BG		SW GW	Sand and gravel, yellowish-gray to pale yellowish-brown. Gravel up to 1" in longest dimension. Locally stained dark yellowish-orange, wet.	209
								No sample collected from 58' to 61'.	
60									

WELL DIAGRAM



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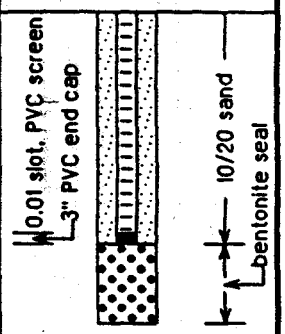
Monitoring Well 002G13DA

Project: *NSA Memphis*	Location: *Millington, TN SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.05 feet msl*
Started at *1110 on 1-19-96*	TOC Elevation: *269.12 feet msl*
Completed at *1130 on 1-20-96*	Depth to Groundwater: *5.36 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger, 5' Flights*	Groundwater Elevation: *263.76 feet msl*
Drilling Company: *Alliance Drilling*	Total Depth: *67.0 feet*
Geologist: *D. Ladd, J. Kingsbury, A. Choate*	Well Screen: *55 to 65 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			24	141	BG		SW GW	Sand and gravel, moderate yellowish-brown to dark yellowish-brown color.	206
								Color change to dusky yellow brown. Wet.	204.6
								No sample collected from 62.5' to 65'.	
65			25	100	BG		SW GW SP	Fine to coarse-grained sand and gravel, olive-gray to light olive gray. Fining downward and turning dark yellowish-orange to light brown in color near 65.5'.	202.1' 201.1 200.1
								Cockfield Formation: Sand, fine-grained, dark yellowish-orange to light brown, wet. Terminated soil boring at 67'.	
70									
75									
80									
85									
90									

WELL DIAGRAM



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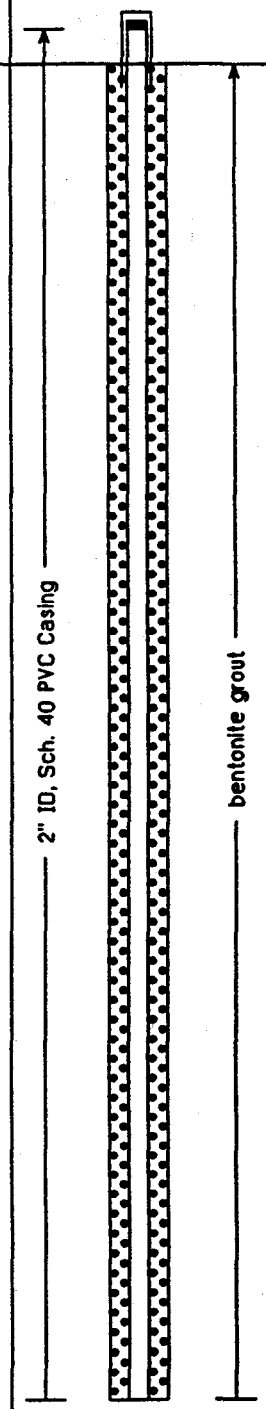
Monitoring Well 002G13MA

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.23 feet msl*
Started at *1300 on 1-21-96*	TOC Elevation: *269.20 feet msl*
Completed at *1145 on 1-22-96*	Depth to Groundwater: *5.38 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger With 5' Flights*	Groundwater Elevation: *263.82 feet msl*
Drilling Company: *Alliance Drilling*	Total Depth: *46.0 feet*
Geologist: *D. Ladd, J. Kingsbury, A. Choate*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1		BG		OL	(0-34') Upper Alluvium (see descriptions below).	
							ML CL	Clay and silt, dark yellowish-brown, moist, with organic material and roots.	265.2
5							ML	Silty clay/clayey silt, greenish-gray and moderate yellowish-brown, slightly moist, soft to slightly firm, with some dark iron staining.	263.2
								Clayey silt, greenish-gray and moderate yellowish-brown, with iron/manganese inclusions and organic material, slightly moist.	
		◢	2		BG			Iron-manganese nodules increasing in percentage and size (up to .5" in diameter).	
10								Some staining with a dark yellowish-orange material.	
								Increase in clay percentage.	
								Clayey silt, light olive gray color stained light brown to dark yellowish-orange. Moisture content increases and the percentage of iron/manganese nodules decreases.	
15		◢	3		BG			Very moist at 14' becoming less moist near 16', rare iron/manganese nodules.	
								Clayey silt, medium gray to light olive gray stained light brown to dark yellowish-orange, very moist.	
									248.2
20							CL	Silty clay, medium light to medium gray, wet.	
								Dark greenish-gray to grayish-olive green color, wet.	
								Very moist.	
25								Light olive gray to grayish-olive green color. Very moist and soft.	
									239.2
30							ML	Clayey silt, light olive gray to grayish-olive green color, slightly moist, soft.	

WELL DIAGRAM



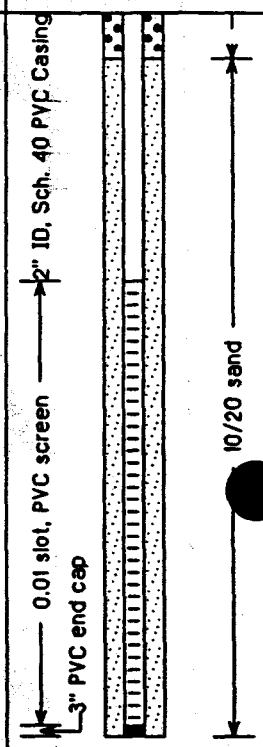
EnSafe/Allen & Hoshall

Monitoring Well 002G13MA

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#2 - Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.23 feet msl*
Started at *1300 on 1-21-96*	TOC Elevation: *269.20 feet msl*
Completed at *1145 on 1-22-96*	Depth to Groundwater: *5.38 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger With 5' Flights*	Groundwater Elevation: *263.82 feet msl*
Drilling Company: *Alliance Drilling*	Total Depth: *46.0 feet*
Geologist: *D. Ladd, J. Kingsbury, A. Choate*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	Sandy silt with rare coarse subangular sand grains. Wet. Olive gray color, wet, soft.	
35								Sandy silt with fine to coarse-grained sand between 34' and 35' fining downward to fine-grained sand between 35' and 36', soft. Top of Deeper Alluvium deposits estimated at 34'.	231
							SW GW	Sand and gravel, gravel up to 1" in diameter, light olive gray.	229.7
							SW SM	Silty sand, light olive gray	
40								Silty sand with some gravel, light olive gray to light gray. No sample collected from 40' to 46' due to heaving sand.	227.2
45								Terminated soil boring at 46'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log for monitoring well 002G13DA.	221.2
50									
55									
60									

WELL DIAGRAM



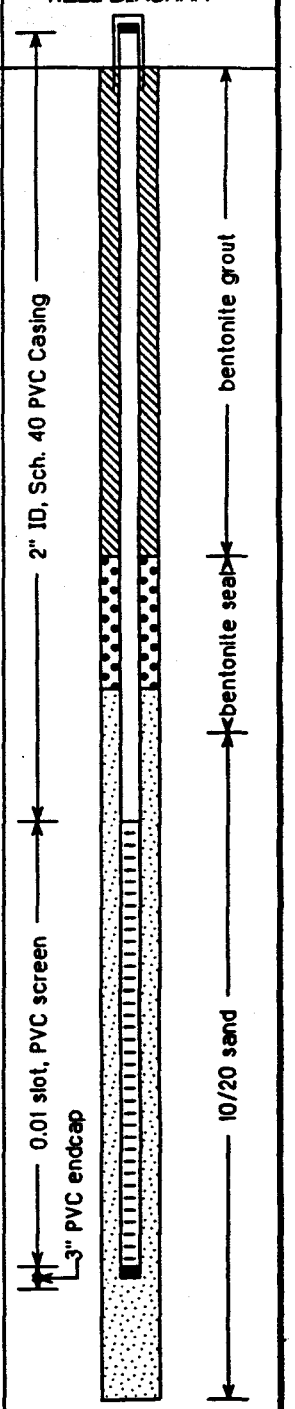
EnSafe/Allen & Hoshall

Monitoring Well 002G13UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *267.13 feet msl*
Started at *1400 on 1-22-96*	TOC Elevation: *268.96 feet msl*
Completed at *0845 on 1-23-96*	Depth to Groundwater: *3.30 feet* Measured: *4/8/96*
Drilling Method: *4 1/4" ID Hollow-Stem Auger With 5" Flights*	Groundwater Elevation: *265.66 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *30.0 feet*
Geologist: *D. Ladd, J. Kingsbury, A. Choate*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-30') Upper Alluvium (see descriptions below).	
							CL ML	Clay and silt, dark yellowish-brown, moist, with organic material and roots.	265.1
								Silty clay/clayey silt, greenish-gray and moderate yellowish-brown, slightly moist, soft to slightly firm, with some dark iron staining.	263.1
5							ML	Clayey silt, greenish-gray and moderate yellowish-brown, with iron/ manganese inclusions and organic material, slightly moist.	
								Iron-manganese nodules increasing in percentage and size (up to .5" in diameter).	
10								Some staining with a dark yellowish-orange material.	
								Increase in clay percentage.	
								Clayey silt, light olive gray color stained light brown to dark yellowish-orange. Moisture content increasing as iron/manganese nodules decrease in percentage.	
15								Very moist at 14' becoming less moist near 16', rare iron/manganese nodules.	
								Clayey silt, medium gray to light olive gray stained light brown to dark yellowish-orange, very moist.	
									248.1
20							CL	Silty clay, medium light to medium gray, wet.	
								Dark greenish-gray to grayish-olive green color, wet.	
								Very moist.	
25								Light olive gray to grayish-olive green color. Very moist and soft.	
									239.1
							ML	Clayey silt, slightly moist, soft.	
30									237.1

WELL DIAGRAM



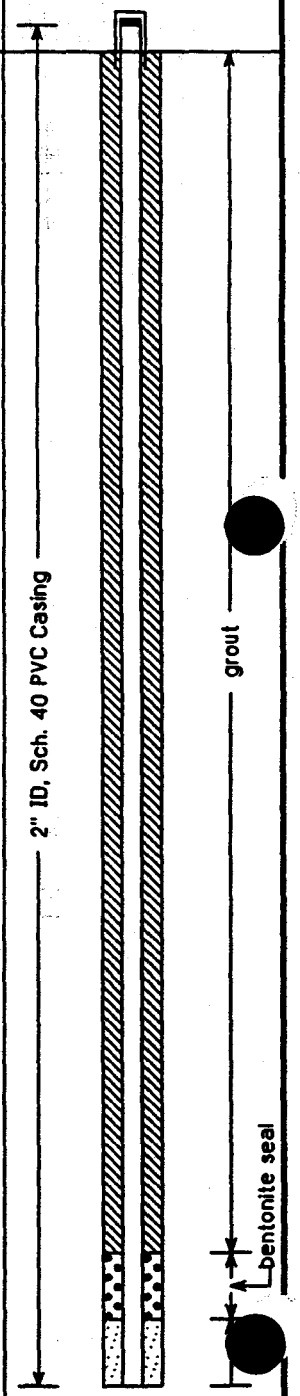
EnSafe/Allen & Hoshall

Monitoring Well 002G14DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *269.00 feet msl*
Started at *1213 on 2-14-96*	TOC Elevation: *271.00 feet msl*
Completed at *1400 on 2-14-96*	Depth to Groundwater: *6.90 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *264.10 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-32') Uper Alluvium (see descriptions below).	
			1	83	3			Clayey silt, dark yellowish-brown to brownish-gray	
5								Some organic material between 5' and 6'.	
10			2	80	BG		ML	Silt, light yellowish-brown to yellowish-gray mottled with dark orangish-yellow material. Organic material (specks) common from 10' to 16'. Very moist.	
15								Common iron staining from 16' to 20'.	
20			3	90	BG			Silt and clay, olive-gray to greenish-gray, wet.	249
25							ML CL	Slightly moist between 25' and 29'.	
30			4	90	BG			Light olive gray color; mottled with brown to reddish-brown material.	237
							ML SM	(32-66') Deeper Alluvium (see descriptions below). Light olive gray silt to fine sand. No mottling. Wet.	
35									233
							SM	More sand from 36' to 39'.	
40							SP		230

WELL DIAGRAM



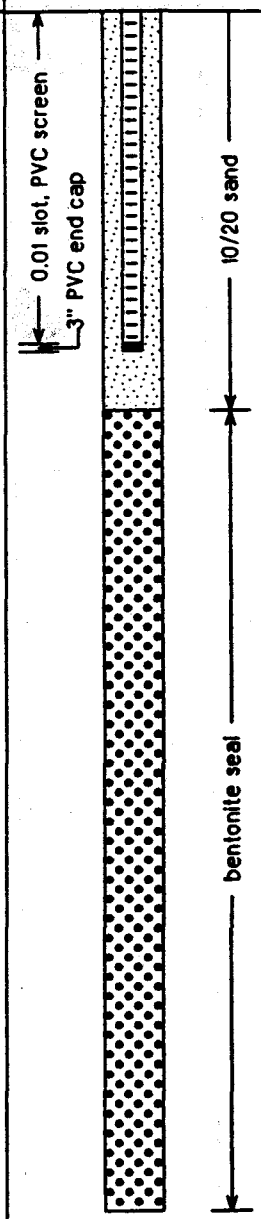
EnSafe/Allen & Hoshall

Monitoring Well 002G14DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *269.00 feet msl*
Started at *1213 on 2-14-96*	TOC Elevation: *271.00 feet msl*
Completed at *1400 on 2-14-96*	Depth to Groundwater: *6.90 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *264.10 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	90	BG		SP	Coarse-grained sand with rare gravel. Dusky yellow color from 40' to 41' changing to olive gray in color from 42' to 43'.	226
45							SP GW	Sand and gravel, reddish-brown to dark orangish-yellow.	223
							SP	Coarse-grained sand with some gravel. Dark orangish-yellow to reddish-brown becoming dusky yellow around 49' to 50'.	219
50			6	110	BG		SP	Sand, fine-grained, yellowish-gray to very light yellowish-brown, finely micaceous, wet.	
55									
60			7	90	BG				
65								Some ironstone and reddish-brown sand.	203
								Cockfield Formation: clay and silt, dark gray.	
70			8	100	BG		CL ML		
75									193
								Terminated soil boring at 76'.	
80									

WELL DIAGRAM



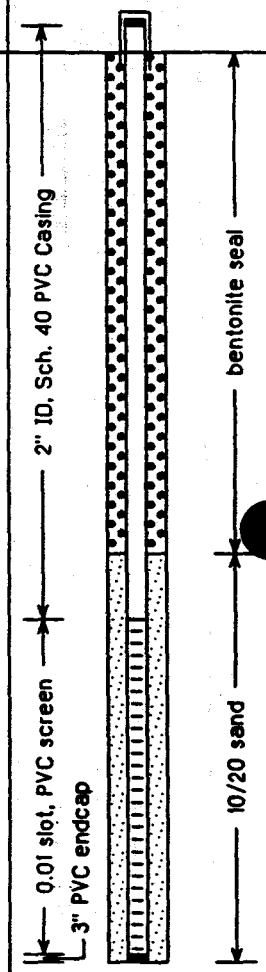
EnSafe/Allen & Hoshall

Monitoring Well 002G14UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#2 – Southside Landfill*
Project No.: *106-08420*	Surface Elevation: *269.17 feet msl*
Started at *1455 on 2-14-96*	TOC Elevation: *271.23 feet msl*
Completed at *1530 on 2-14-96*	Depth to Groundwater: *5.50 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" core barrel inside 6" casing*	Groundwater Elevation: *265.73 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *27.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *17 to 27 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1					(0-27') Upper Alluvium (see descriptions below). Clayey silt, dark yellowish-brown to brownish-gray.	
5								Some organic material between 5' and 6'.	
10		■	2				ML	Silt, light yellowish-brown to yellowish-gray mottled with dark orangish-yellow material. Organic material (specks) common from 10' to 16', very moist.	
15		■	3					Common iron staining from 16' to 20'.	
20								Silt and clay, olive gray to greenish-gray, wet.	249.2
							ML CL		
25								Slightly moist between 25' and 27'.	242.2
								Terminated soil boring at 27'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 002G14DA.	
30									
35									
40									

WELL DIAGRAM

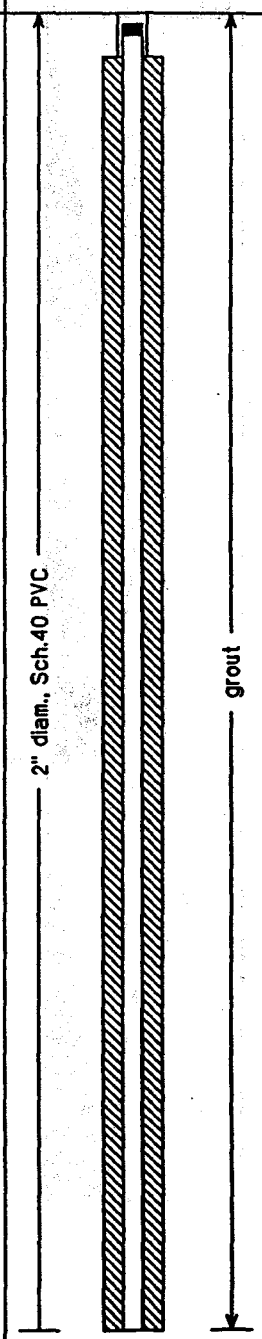


Monitoring Well 002G15DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *0800 on 6-19-98*	TOC Elevation: *feet msl*
Completed at *0930 on 6-19-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100			ML	(0-1') Soil fill, then silt, olive gray mottled with dark yellowish brown to 2'. Contains a lot of roots and grass.	
5			2	50				Silt, dark greenish gray to greenish gray; mottling with some clay, dark yellowish orange considerable roots; grades to light olive gray and mottled with dark yellowish orange, rare iron-manganese nodules and carbonaceous materials.	
10								Same as above, with increasing clay fraction.	
15			3	90				Same as above, with increasing clay fraction.	
20							ML	Same as above, with decreasing clay fraction, increasing percentage of iron-manganese nodules to 19'.	
25			4	90				Silt, light olive gray, with minor clay fraction, homogeneous.	
30								Silt, olive gray, with increasing clay fraction, slightly micaceous and containing lignite specks.	

WELL DIAGRAM



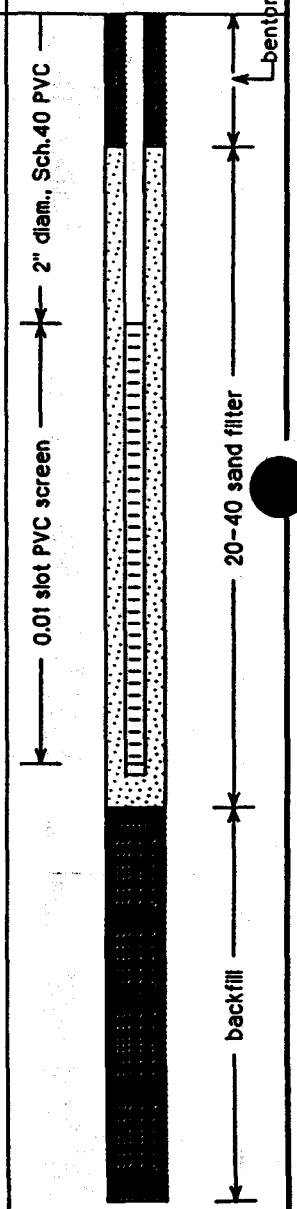
EnSafe (SM)

Monitoring Well 002G15DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *0800 on 6-19-98*	TOC Elevation: *feet msl*
Completed at *0930 on 6-19-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	Wood fragments at 33'.	
35							ML/CL	Silt and clay, light olive gray; small fraction of very fine sand.	
			5	95				Silt and clay, olive gray, with lignite specks; grades to silt with minor clay fraction and very fine to fine sands. Sand size and fraction increasing with depth.	
40							SW	Sand, light olive gray to yellowish gray, fine to medium grain size; with very fine gravel and very rare clay or silt fraction.	
								Increasing grain size with depth toward very fine to fine gravels and coarse sands; grades to coarse gravels at 47'.	
45								Coarse gravel layer.	
			6	85				Top of Cockfield Formation at 47'.	
50							ML	Silt with minor clay and very fine to fine sand, micaceous, dark yellowish brown to dusky yellowish brown in color.	
								(50-52.5') Silt, light olive gray, with increasing fraction of fine sands and very fine sands.	
55							SP	Sand, light olive gray to light gray, fine to medium grain size, with rare clay and lignitic seams, micaceous.	
			7	90				Sand, fine-grained, light brownish gray to very light gray in color.	
60								***End of boring @ 57' bgs***	

WELL DIAGRAM

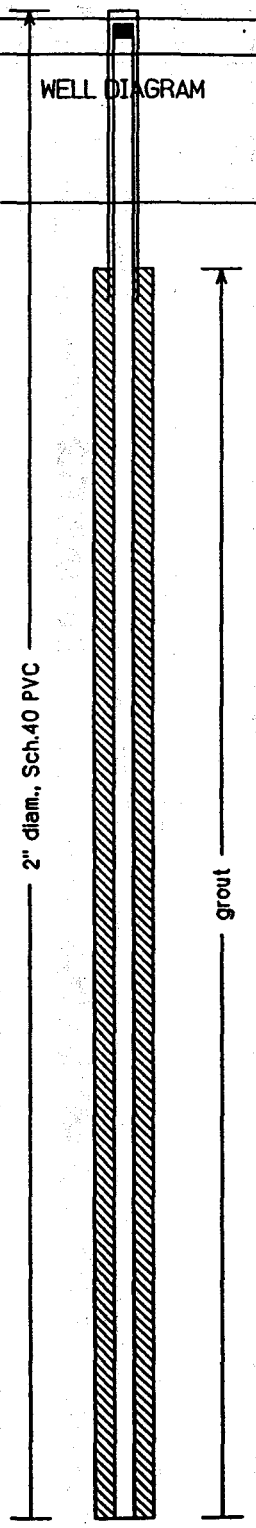


Monitoring Well 002G16DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1415 on 6-16-98*	TOC Elevation: *feet msl*
Completed at *1545 on 6-16-98*	Depth to Groundwater: *18.0 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *67 feet*
Geologist: *David E. Ladd*	Well Screen: *46 to 56 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-3') Silt, dark yellowish brown, contains roots and grass.	
			1	67				(3-7') Same as above, becoming clayey. Contains small fraction of olive gray clayey material; rare mica.	
5									
			2	75			ML	(7-13') Same as above, clayey with more olive gray material.	
10									
								(13-17') Silt, olive gray to medium gray. An entire 4-foor section contains well-preserved, scattered wood pieces, mainly twigs; slightly micaceous, slightly moist.	
15									
			3	75			ML	(17-27') Silt, clayey, olive gray to dark greenish gray. Becoming more clayey below 18.5' Contains rare scattered wood and carbonaceous material throughout section. Very moist.	
20									

WELL DIAGRAM

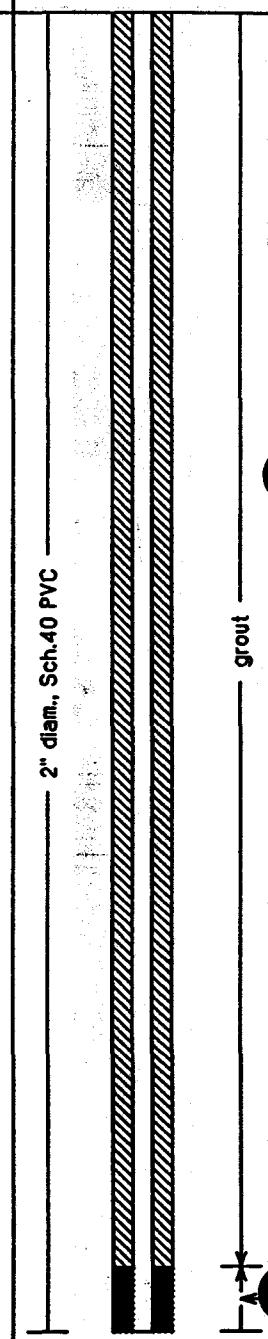


Monitoring Well 002G16DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1415 on 6-16-98*	TOC Elevation: *feet msl*
Completed at *1545 on 6-16-98*	Depth to Groundwater: *18.0 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *67 feet*
Geologist: *David E. Ladd*	Well Screen: *46 to 56 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
25							ML		
			4	100				(27-28.5') Same as above; contains some small shell fragments.	
30							SM SC	(28.5-34') Sand, silty and clayey, very fine to very coarse grain size. Contains abundant wood and shell fragments. Olive gray.	
35							ML	(34-36') Silt, slightly sandy with occasional sand lenses. Olive gray.	
			5	95			SW	(36-37') Sand, very fine to very coarse, and gravel up to .25" (long dimension); very silty and clayey. Olive gray, poorly sorted; wet.	
								(37-38') Same as above.	
40							SP	(38-42') Sand, medium to very coarse, and gravel. Gravel is mostly chert and quartz, rounded and angular, up to 1.5" (long dimension). Moderate yellowish brown; wet.	

WELL DIAGRAM

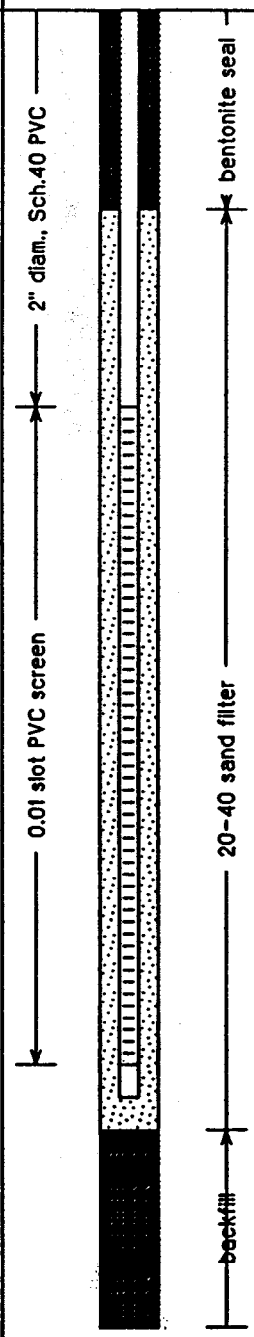


Monitoring Well 002G16DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1415 on 6-16-98*	TOC Elevation: *feet msl*
Completed at *1545 on 6-16-98*	Depth to Groundwater: *18.0 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *67 feet*
Geologist: *David E. Ladd*	Well Screen: *46 to 56 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SP		
							SP	(42-44') Sand, medium to very coarse, and gravel. Pinkish gray color, mixed with moderate yellowish brown. Gravel up to 1.5" (long dimension); wet.	
45							SW	(44-47') Gravel and sand, very coarse grain size. Pinkish gray mottling with dark yellowish orange. Gravel is up to 3.5" (long dimension); wet. From 44-45', iron-stained, dark yellowish orange. Poorly sorted.	
			6	85			SW	(47-48.5') Gravel and sand, very coarse-grained. Gravel is much smaller than above (up to 1.5" long dimension). Some well rounded, some angular gravels. Pinkish gray mottling with dark yellowish orange; wet.	
							GP		
50							GW	(48.5-49.5') Gravel. Contains some sand. Gravel up to 3" (long dimension). Grayish orange, wet.	
							SW	(49.5-51') Gravel and sand, very caorse-grained; pinkish gray mottled with dark yellowish orange. Gravel is up to 1" (long dimension).	
55								(51-57') Sand, coarse to very coarse, and gravel. Dark yellowish orange; gravel is up to 1.5" (long dimension); wet.	
			7	75				(57-57.5') Same as above; last 3" becoming light olive gray mottled with dusky yellowish brown.	
60							CL	(57.5-62.5') Clay, dusky yellowish brown, and sand, very fine, light olive gray. Clay and sand occur intermittently as bands. Contains abundant seams of lignitic material. Clay is very stiff; micaceous.	

WELL DIAGRAM



Monitoring Well 002G16DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1415 on 6-16-98*	TOC Elevation: *feet msl*
Completed at *1545 on 6-16-98*	Depth to Groundwater: *18.0 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *67 feet*
Geologist: *David E. Ladd*	Well Screen: *46 to 56 feet*

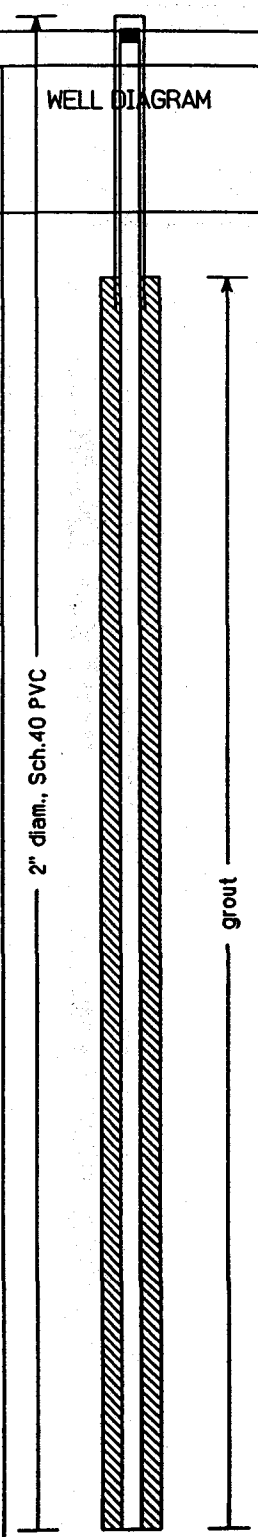
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							CL			
								(62.5-65.5') Sand, very fine, olive gray to light olive gray. Wet. Contains abundant lignitic material near 65'.		
65							SP	(65.5-67') Sand, fine to very fine, light gray; wet. Very clean.		backfill
			8	100				***End of boring @ 67' bgs***		
70								Remainder of this log is taken from boring 002G16UC, ~10' north of boring 002G16DA (6/19/98):		
								(67-68.5') Sand, light gray, very fine to fine, with mica and lignite specks.		
								(68.5-74') Silt, with some clay, olive gray; micaceous, grading to brownish gray silt and clay, and containing very fine sand, decreasing with depth.		
75								(75.5-77') Lignite layer ~1' thick grading to brownish gray to olive gray with very clayey silt.		
								Boring completed @77'; hole was filled in; no well completed here.		
80										

Monitoring Well 002G17DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1504 on 6-15-98*	TOC Elevation: *feet msl*
Completed at *1700 on 6-15-98*	Depth to Groundwater: *19.18 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *68 feet*
Geologist: *David E. Ladd*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-4') Silt, slightly clayey, moderate yellowish brown to dark yellowish brown.	
			1	50				(4-8') Same as above, mostly moderate yellowish brown with striations that are pale yellowish brown.	
5							ML		
			2	62.5				(8-13') Silt, becoming progressively more clayey with depth. Moderate yellowish brown. Contains pale yellowish brown and olive gray striations, increasing with depth. Increasing fraction of carbonaceous material near 13'.	
10									
								(13-18') Silt, very clayey; olive gray. Contains woody material from 15-17', with the majority near 15'. Contains small fraction of very light gray material near 18'.	
15							ML		
			3	90				(18-25') Silt, less clayey. Olive gray to dark greenish gray, becoming increasingly dark greenish gray with depth. Wood material at 19', 20', 22'.	
20									

WELL DIAGRAM

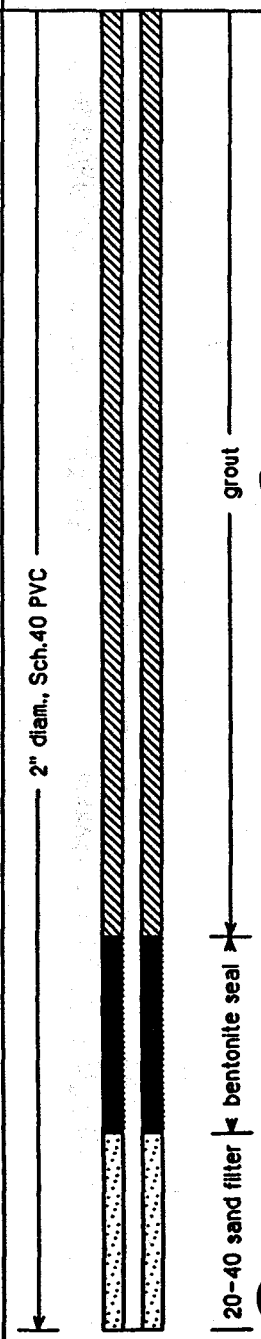


Monitoring Well 002G17DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1504 on 6-15-98*	TOC Elevation: *feet msl*
Completed at *1700 on 6-15-98*	Depth to Groundwater: *19.18 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *68 feet*
Geologist: *David E. Ladd*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
25								(25-28') Silt, dark greenish gray. Contains white shell snails and wood from ~26-28'. This area also contains some darker, carbonaceous material.	
			4	100			ML	(28-29') Same as 25-28'. Contains coarse-grained sand lens at ~28.75' (29-37.5') Silt, olive gray to light olive gray. Contains some very fine sand. Contains coarse-grained sand sand lens at 37'.	
30									
35									
			5	80			SW	(37.5-38') Sand, medium to very coarse, with mostly angular chert and quartz gravel up to .5" (long dimension). Contains small silt and clay fraction. Olive gray to light olive gray. (38-44.5) Grvael and sand, very coarse-grained. Light olive gray to olive gray. Gravel up to 2.5" (long dimension).	
40									

WELL DIAGRAM

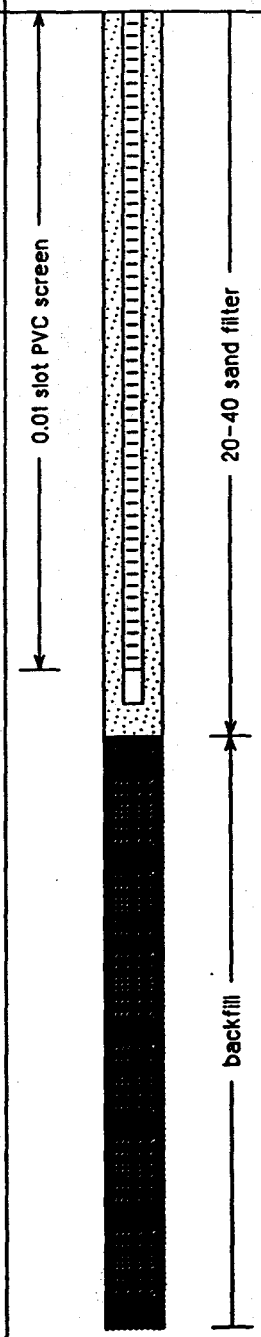


Monitoring Well 002G17DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1504 on 6-15-98*	TOC Elevation: *feet msl*
Completed at *1700 on 6-15-98*	Depth to Groundwater: *19.18 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *68 feet*
Geologist: *David E. Ladd*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW		
45							GW	(44.5-48') Gravel and sand, medium- to very coarse-grained. Mostly dark yellowish orange, mottled with olive gray. Small to large gravel, rounded to angular, 2.5" (long dimension). Coarse sand lens at ~47', pale grayish orange.	
			6	100				(48-50.5') Same as above, no olive gray material.	
50							SC	(50.5-58') Sand, fine to very fine,and clay; dark yellowish orange mottled with light gray. Light gray material is predominate from 53' to 56'. More light gray clayey material near 56'.	
55									
			7	100				(58-60') Same as above; light gray mottled with dark yellowish orange.	
60									

WELL DIAGRAM



EnSafe (SM)

Monitoring Well 002G17DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1504 on 6-15-98*	TOC Elevation: *feet msl*
Completed at *1700 on 6-15-98*	Depth to Groundwater: *19.18 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *68 feet*
Geologist: *David E. Ladd*	Well Screen: *40 to 50 feet*

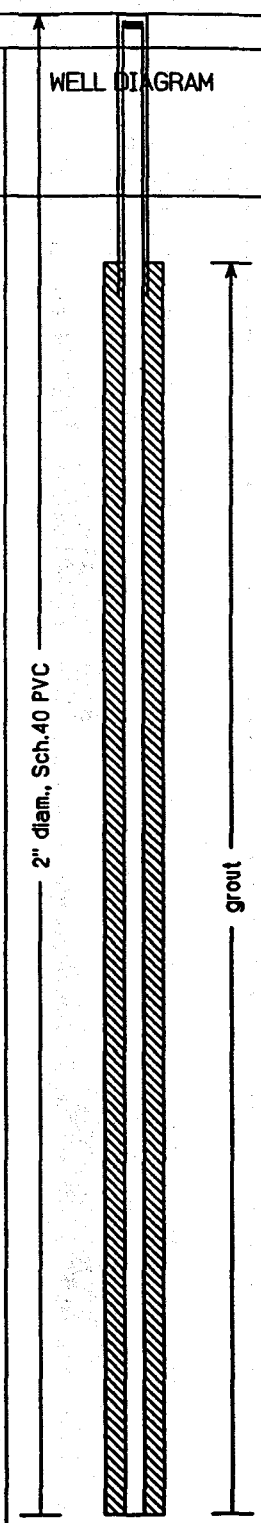
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SC	(60-68') Sand, very fine to fine. Light gray in color. Clay lenses at 63' and 66'. Very clean.		backfill
65			8	100				***end of boring @ 68' bgs.***		
70								Remainder of log is taken from log of boring 002G17UC, ~10-15' south of 002G17DA (0930 on 6/20/98) (67-72') Clay, sandy (very fine), dark yellowish brown. Micaceous, contains lignitic material.		
75								(72-75') Clay, sandy (very fine). Same as above, except becoming much sandier.. Abundant lignite material and seams from 74-75'. (75-77') Clay, dusky yellowish brown to dark yellowish brown. Contains lignitic material; very stiff. ***Bottom of boring 002G17UC @ 77' bgs.***		
80										

Monitoring Well 002G17UC

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *on 6-20-98*	TOC Elevation: *feet msl*
Completed at *1230 on 6-20-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *77 feet*
Geologist: *David E. Ladd*	Well Screen: *57 to 67 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-4') Silt, slightly clayey, moderate yellowish brown to dark yellowish brown.	
			1	50				(4-8') Same as above, mostly moderate yellowish brown with striations that are pale yellowish brown.	
5							ML		
			2	62.5				(8-13') Silt, becoming progressively more clayey with depth. Moderate yellowish brown. Contains pale yellowish brown and olive gray striations, increasing with depth. Increasing fraction of carbonaceous material near 13'.	
10									
								(13-18') Silt, very clayey; olive gray. Contains woody material from 15-17', with the majority near 15'. Contains small fraction of very light gray material near 18'.	
15							ML		
			3	90				(18-25') Silt, less clayey. Olive gray to dark greenish gray, becoming increasingly dark greenish gray with depth. Wood material at 19', 20', 22'.	
20									

WELL DIAGRAM

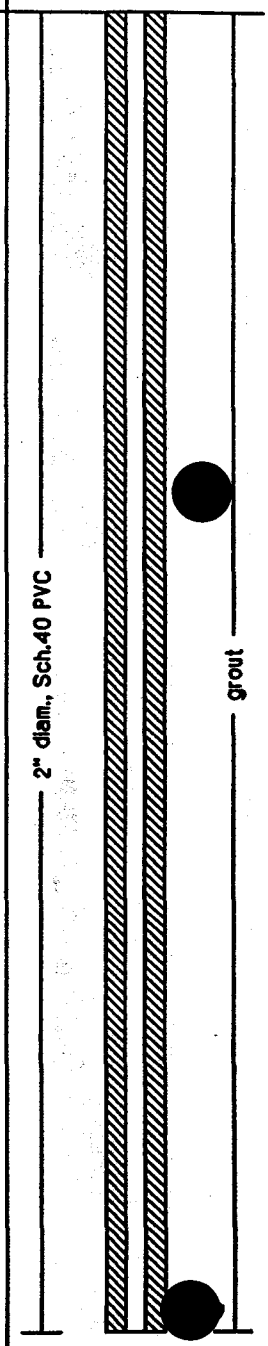


Monitoring Well 002G17UC

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *on 6-20-98*	TOC Elevation: *feet msl*
Completed at *1230 on 6-20-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *77 feet*
Geologist: *David E. Ladd*	Well Screen: *57 to 67 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
25								(25-28') Silt, dark greenish gray. Contains white shell snails and wood from ~26-28'. This area also contains some darker, carbonaceous material.	
			4	100			ML	(28-29') Same as 25-28'. Contains coarse-grained sand lens at ~28.75' (29-37.5') Silt, olive gray to light olive gray. Contains some very fine sand. Contains coarse-grained sand sand lens at 37'.	
30									
35									
			5	80			SW	(37.5-38') Sand, medium to very coarse, with mostly angular chert and quartz gravel up to .5" (long dimension). Contains small silt and clay fraction. Olive gray to light olive gray. (38-44.5) Grvael and sand, very coarse-grained. Light olive gray to olive gray. Gravel up to 2.5" (long dimension).	
40									

WELL DIAGRAM

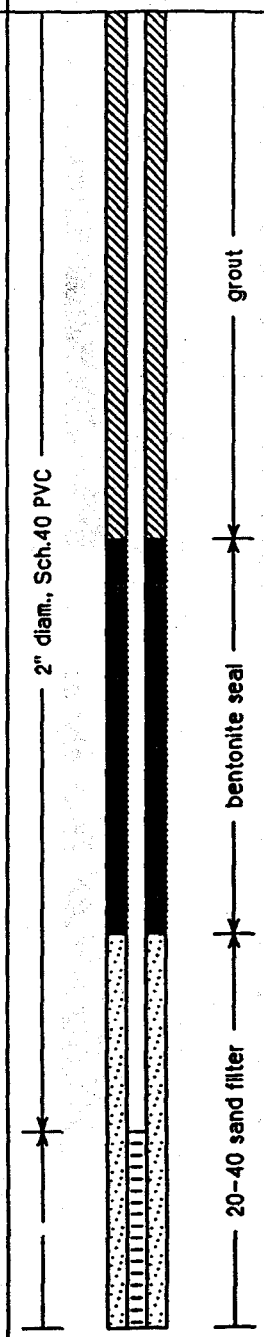


Monitoring Well 002G17UC

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *on 6-20-98*	TOC Elevation: *feet msl*
Completed at *1230 on 6-20-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *77 feet*
Geologist: *David E. Ladd*	Well Screen: *57 to 67 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW		
45							GW	(44.5-48') Gravel and sand, medium- to very coarse-grained. Mostly dark yellowish orange, mottled with olive gray. Small to large gravel, rounded to angular, 2.5" (long dimension). Coarse sand lens at ~47', pale grayish orange.	
			6	100				(48-50.5') Same as above, no olive gray material.	
50							SC	(50.5-58') Sand, fine to very fine,and clay; dark yellowish orange mottled with light gray. Light gray material is predominate from 53' to 56'. More light gray clayey material near 56'.	
55									
			7	100				(58-60') Same as above; light gray mottled with dark yellowish orange.	
60									

WELL DIAGRAM

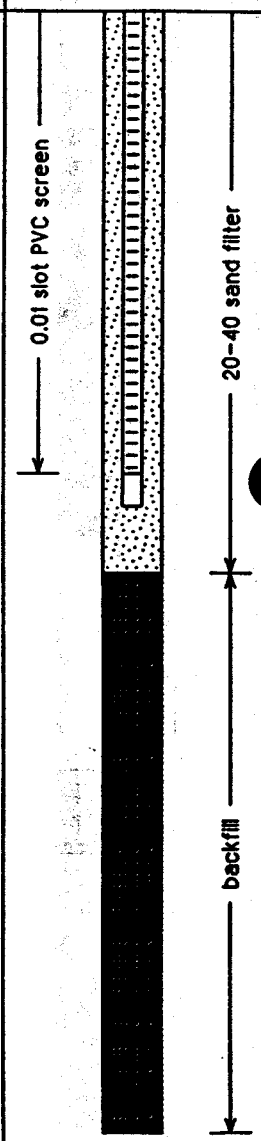


Monitoring Well 002G17UC

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *on 6-20-98*	TOC Elevation: *feet msl*
Completed at *1230 on 6-20-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *77 feet*
Geologist: *David E. Ladd*	Well Screen: *57 to 67 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SC	(60-68') Sand, very fine to fine. Light gray in color. Clay lenses at 63' and 66'. Very clean.	
65									
			8	100				***end of boring 002G17DA @ 68' bgs.*** Remainder of log is taken from log of at location 002G17UC, ~10-15' south of 002G17DA (0930 on 6/20/98)	
70							CL	(67-72') Clay, sandy (very fine), dark yellowish brown. Micaceous, contains lignitic material.	
75								(72-75') Clay, sandy (very fine). Same as above, except becoming much sandier. Abundant lignite material and seams from 74-75'.	
			9	100				(75-77') Clay, dusky yellowish brown to dark yellowish brown. Contains lignitic material; very stiff.	
								Bottom of boring 002G17UC @ 77' bgs.	
80									

WELL DIAGRAM



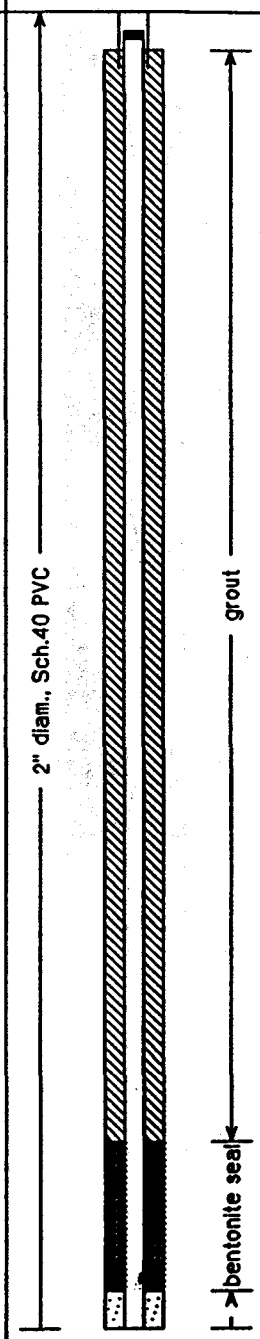
EnSafe (SM)

Monitoring Well 002G18DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1030 on 6-17-98*	TOC Elevation: *feet msl*
Completed at *1100 on 6-17-98*	Depth to Groundwater: *12.91 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *67 feet*
Geologist: *David E. Ladd*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100			ML	(0-3') Silt, dark yellowish brown mottled with a small fraction of light olive gray material; contains some orgainc material.	
5								(3-7') Silt, light olive gray mottled with some dark yellowish orange. Contains abundant organic material and nodules.	
			2	80				(7-10.5') Silt, dark yellowish brown mottled with light olive gray gray; clayey and containing iron-manganese nodules.	
10							CL	(10.5-17') Clay, stiff, dark yellowish brown mottled with light olive gray and dark yellowish orange. Contains iron-manganese nodules; mosit.	
15									
			3	75				(17-20') Same as above; not as stiff. Becomes greenish gray with depth.	
20							SM	(20-27') Silt and sand, very fine. Contains clayey areas. Light olive gray to greenish gray, and micaceous; continas rare iron- manganese nodules.	
25									
			4	90				(27-32') Same as above, becoming increasing sand fraction with depth.	
30							SC	(32-35') Sand, very fine to fine, olive gray to dark greenish gray, clay-rich. Wet. Rare iron-manganese nodules. Coarsening downward.	
35							SW		

WELL DIAGRAM

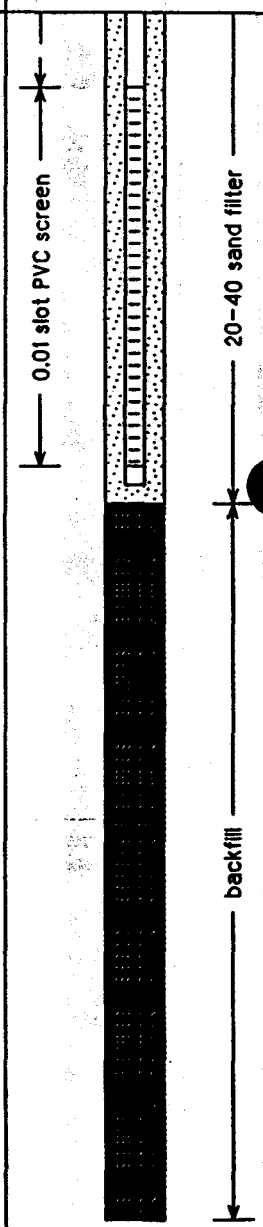


Monitoring Well 002G18DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1030 on 6-17-98*	TOC Elevation: *feet msl*
Completed at *1100 on 6-17-98*	Depth to Groundwater: *12.91 feet* Measured: *6/17/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *67 feet*
Geologist: *David E. Ladd*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	80			SW	(35-37') Sand, fine to very coarse; rare small gravel. Olive gray. Contains clay seams and is generally clay-rich. Wood fragments at 36' and wet.	
								(37-39') Same as above; gravels becoming larger with depth. Clay seam at 38'.	
40							CL SW	(39-42') Clay and sand, fine to medium grain size. Dark greenish gray to medium blue gray. Contains rare scattered gravel up to .25" (long dimension).	
							SP GP	(42-45.5') Sand, very coarse, and gravel, up to 1" (long dimension), rounded and angular. Olive gray to light olive gray mottled with dark yellowish brown; wet.	
45							GP		
			6	90			SP GP	(45.5-46') Grvael up to 2" (long dimension), mostly rounded quartz and chert; wet.	
							SC		
50							SP CL	(46-47') Sand, very coarse, and gravel up to 1.5" (long dimension), rounded and angular. Olive gray to light olive gray mottled with dark yellowish brown. Wet. Contains some oolitic chert gravel.	
								(47-47.5') Clay and sand, fine with gravel. Very light gray to pinkish gray.	
55			7	90				(47.5-57') Sand, fine to very fine, light gray with scattered lignite and mica grains. Scattered clay lenses, light gray to yellowish gray, wet. Sand seems to be "quick" at 47.5'.	
60								Bored to 67' but left 10' of core in the hole.	
65									
70									

WELL DIAGRAM



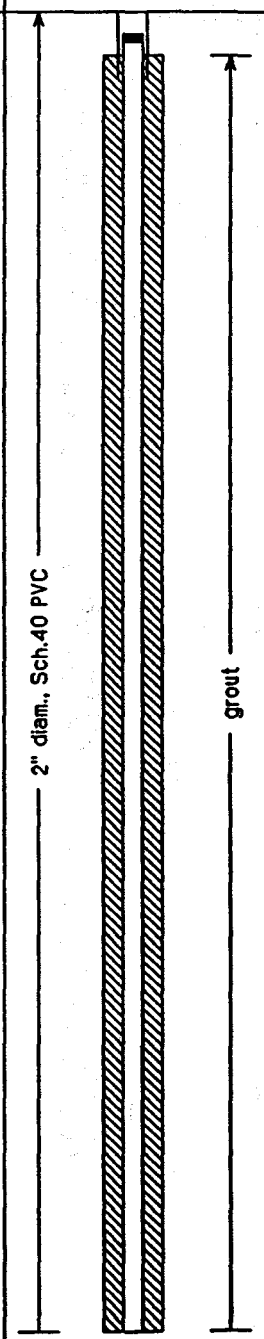
EnSafe (SM)

Monitoring Well 002G19DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1300 on 6-18-98*	TOC Elevation: *feet msl*
Completed at *1415 on 6-18-98*	Depth to Groundwater: *feet* Measured: *6/18/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	83			ML CL	(0-3') Silt, clayey, light olive gray, mottled with dark yellowish brown and dark yellowish orange. Contains roots and bark. (3-7') Similar to above with increased clay content, stiff. Also contains roots, iron-manganese nodules, and rare carbonaceous materials.	
5			2	100				(7-17') Similar to above with dominant clay fraction; stiff. Contains rare iron-manganese and carbonaceous nodules.	
10									
15			3	75				Becoming very clay-rich at 13.5'.	
20							ML	Dark greenish gray (at top mottled with yellowish brown material to about 23') - decreasing with depth. Silt with some clay	
25			4	80				Last of yellowish brown mottling. (27-37') Dark greenish gray clayey silt, slightly micaceous.	
30									

WELL DIAGRAM



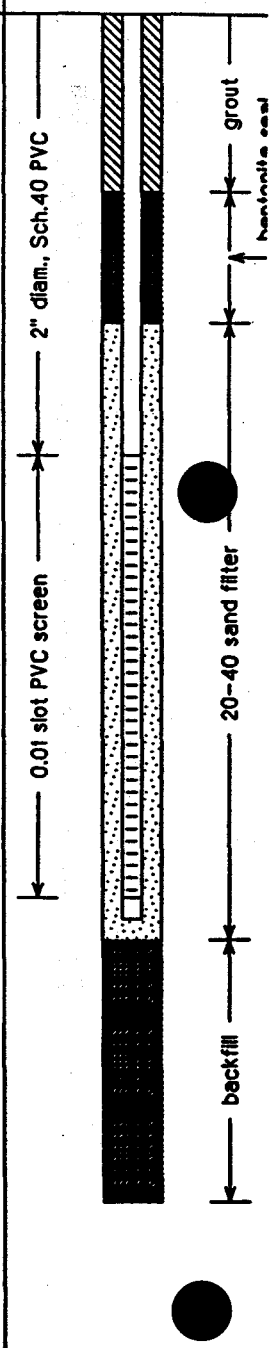
EnSafe (SM)

Monitoring Well 002G19DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1300 on 6-18-98*	TOC Elevation: *feet msl*
Completed at *1415 on 6-18-98*	Depth to Groundwater: *feet* Measured: *6/18/98*
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
35			5	90			ML	Clay seam ~.25" thick, grading to clayey silt; olive gray in color. (36-37') Wood fragments. (37-38') Similar to above, with small fraction very fine sand.	
40							SW GP	(38-39') Sand, fine to coarse, light olive gray silt in interstices. Sandy gravel with some cobbles (dimensions: 1" x 2.5"). Light olive gray silty clay seam (2.5 to 3" thick) with gravels grading to moderate yellowish brown to dark yellowish orange sands and gravels; iron-staining present. A 2 to 3.5" thick layer of mostly gravels (~.5 to 1" long dimension); iron-staining present. Iron-staining decreasing.	
45			6	95					
50							SM SC	Lignitic zone at 50'; transitional to 51.5', lignite seams, gravels, and silty/clayey sands (medium to coarse, brownish gray).	
55			7	100			SP CL	Sand, fine, dark to pale yellowish brown, with lignite inclusions and intermittent clay seams. A 3" thick sand layer, fine-grained and light gray in color; grades to to brownish gray clay and fine to very fine sands, micaceous. Dimension of mica flakes increases with depth to visible sheets ~ 1mm in size (appears to be muscovite); fraction of very fine sand increases with depth as well.	
60								***End of boring @57' bgs.***	

WELL DIAGRAM



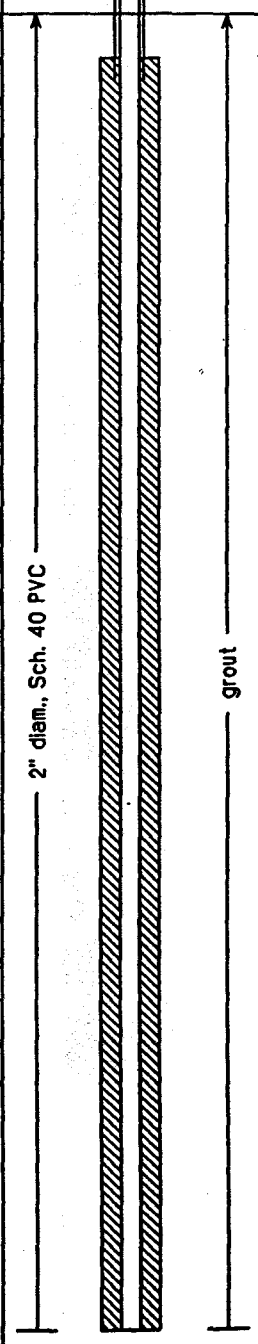
EnSafe (SM)

Monitoring Well 002G20DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1345 on 6-22-98*	TOC Elevation: *feet msl*
Completed at *1640 on 6-22-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *54 feet*
Geologist: *David E. Ladd*	Well Screen: *to feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-7') Silt, clayey, dark yellowish brown mottled with dark yellowish orange and a small fraction of olive gray material.	
5									
			1	71				(7-17') Same as above. Contains increased fraction of dark yellowish orange material; iron-manganese nodules present.	
10							ML		
15									
			2	75				(17-20') Same as above.	
20							ML	(20-24') Silt, very clayey, light olive gray to medium gray, mottled with dark yellowish orange. Iron-manganese nodules present near 20'.	
25							ML	(24-27') Silt, dark yellowish orange mottled with rare light gray material. Contains carbonaceous material and/or iron-manganese nodules.	
			3	95				(27-28') Same as above.	
30							ML SP	(28-32') Silt and sand, very fine; pinkish gray to light olive gray.	

WELL DIAGRAM



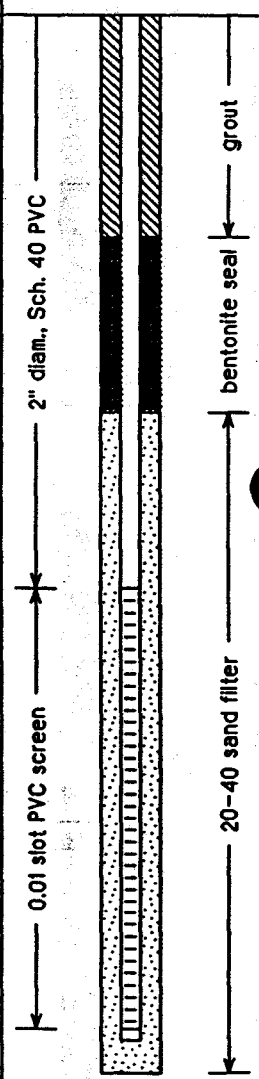
Monitoring Well 002G20DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1345 on 6-22-98*	TOC Elevation: *feet msl*
Completed at *1640 on 6-22-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *54 feet*
Geologist: *David E. Ladd*	Well Screen: *to feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML/SP		
							SP	(32-34.5') Sand, fine to medium, dark yellowish orange, becoming light olive gray near bottom portion of run. Contains scattered gravel. Clay seam at 34'.	
35			4	95			SP/GP	(34.5-37') Sand, medium to very coarse, and gravel up to .5" (long dimension); light to very light gray. Contains clay and abundant dark yellowish orange material from 34 to 34.5'.	
							SP	(37-38') Sand, fine-grained, light gray mottled woth dark yellowish orange.	
40							SC/GP	(38-42') Sand, fine to very coarse, with abundant gravel up to 1" (long dimension). Very clayey material throughout. Dark yellowish orange becoming light gray near 42'; very poorly sorted, wet.	
45							SP	(42-47') Sand, medium to very coarse, and gravel up to 1.5" (long dimension) - one piece up to 3.5" - dark yellowish orange; wet.	
50			5	70				(47-53') Same as above. Sand is dominantly very coarse, gravel smaller in size. Decreasing clay fraction. Pinkish gray in color around 51'; otherwise, appears iron-stained.	
55			6	95			SP	(53-57') Sand, very fine to fine, dark yellowish orange, containing seams of light gray, wet.	
60								***Total depth = 54' bgs.***	

Lithologic description is taken from log of boring 002B20UC.

WELL DIAGRAM

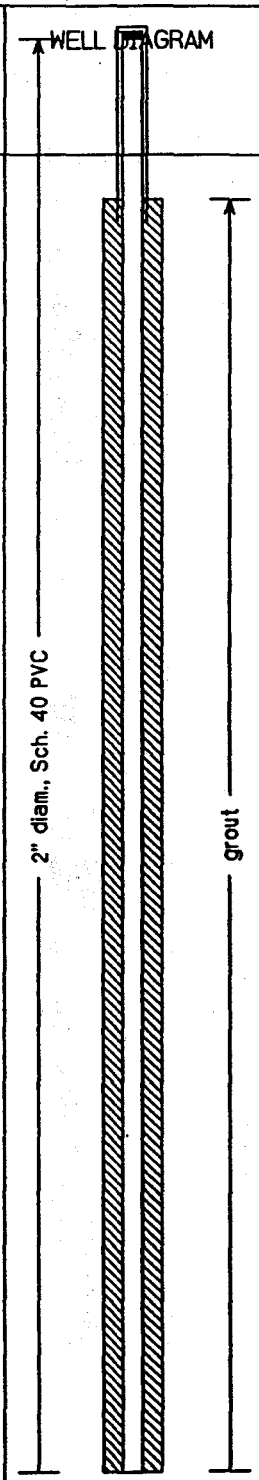


Monitoring Well 002G22DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *0815 on 6-23-98*	TOC Elevation: *feet msl*
Completed at *0930 on 6-23-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							CL ML	(0-4') Silty clay, gray, with iron-staining; grading to clayey silt.	
			1	100					
5								(4-7') Silt, gray to brown, with clay; large pieces of root matter; mottling with gray silt; iron-staining.	
			2	83				(7-17') Same as above; olive gray to brownish gray with rare iron- manganese nodules, increasing in size and frequency with depth, mottled throughout. Iron-manganese nodules common around 11.5 to 12'.	
10								Increase in moisture content.	
							ML CL	Same as above; yellowish brown to dark yellowish brown with rare iron- manganese nodules; Increase in clay fraction with depth to a silty clay.	
15									
			3	100				Increasing mottling, iron-staining; but rare iron-manganese nodules.	
								Clay with rare silt, dark greenish gray.	
20								Decreasing silt; orgainc matter (wood pieces).	
							CL	Organic matter to 26'.	
25									
			4	100			SC	Clayey sand, fine to very fine, dark greenish gray.	
							CL	Clay with rare sand (very fine), medium bluish gray to greenish gray.	
30								Increasing sand with depth, very fine to fine.	

WELL DIAGRAM

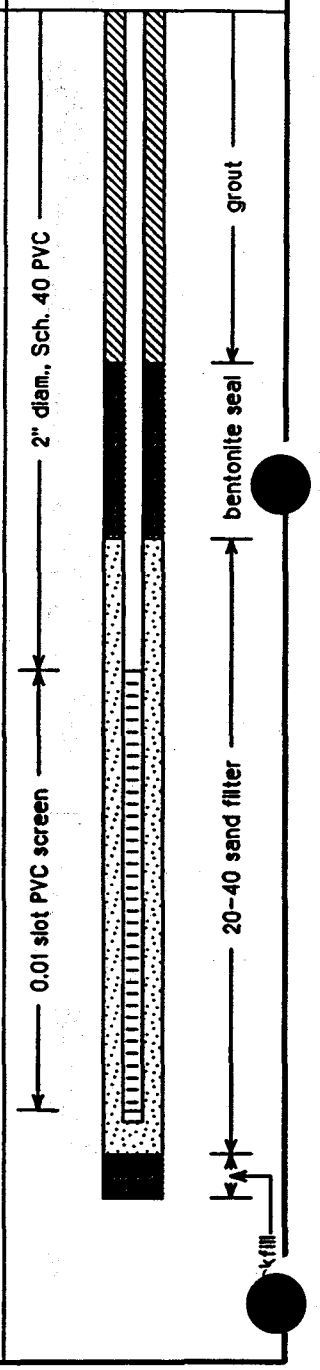


Monitoring Well 002G22DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *0815 on 6-23-98*	TOC Elevation: *feet msl*
Completed at *0930 on 6-23-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							CL		
							SP	Sand, fine to very fine, yellowish gray to very light gray. Sand, fine, and gravel, fine; iron-stained.	
35			5	100			CL	Iron-stained clay with some silt; mottled with moderate yellowish brown material. (36-37') Silty clay with rare fine to very fine sands, yellowish gray to light gray.	
40							SC	Clayey sand to sandy clay with very fine sands, dark to pale yellowish orange.	
							SP/GP	Sand fraction increasing with depth; increasing gravel fraction. Sands, very fine to medium, and gravels, fine to medium; decreased iron-staining.	
45							GP	Dominant gravels, fine to medium, iron-stained; decreased sand fraction.	
			6	100			SP/GP	Sands, medium to coarse, abundant iron-staining; and gravels, very fine, decreasing iron-staining to dominantly homogeneous lithics around 50.5'.	
50							SC/CL	Clayey sands with some very clayey layers (intermittent), grading to a sandy clay with cobbles. (54-55') Sand, fine to medium, abundant iron staining.	
55							CL	Top of Cockfield Formation (olive black clay).	
			7	100				(56-56.75') Fine to medium to very fine, medium gray to light brownish gray layer; grades back to olive black clay around 57'.	
60								***Total depth of well = 57' bgs.***	

WELL DIAGRAM

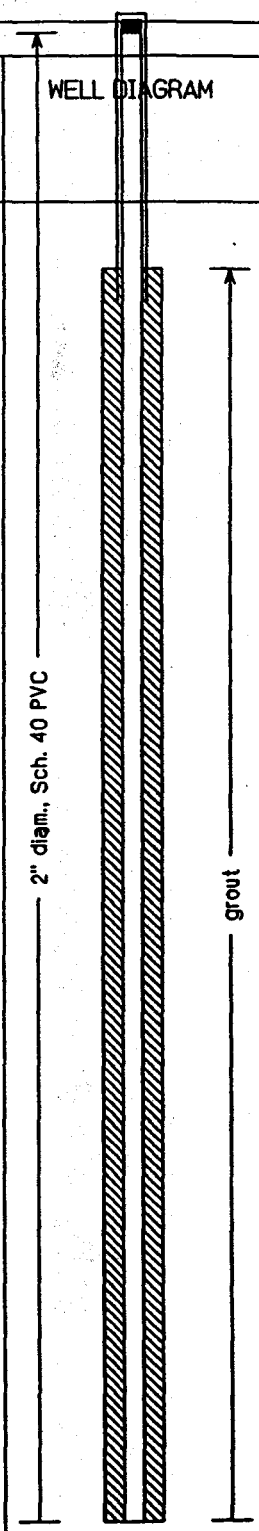


Monitoring Well 002G23DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1340 on 6-23-98*	TOC Elevation: *feet msl*
Completed at *1447 on 6-23-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-3') Lost portion of core; mostly grassy soil.	
								(3-7') Silt, dark yellowish brown, and clay; grades to dusky yellowish brown to ~5.5' where mostly clay and rare silt.	
5								(5.5-7') Silt, dark yellowish brown, mottled with clay; iron-staining present.	
			1	57				Clayey silt, light olive gray to olive gray; silt increasing with depth.	
10							ML CL	Silt, pale yellowish brown, mottled with rare clay. Iron-staining and carbonaceous matter are present. Iron-manganese nodules present and increase in frequency with depth.	
								Same as above.	
15								Same as above.	
			2	85				Though partial recovery, same as above.	
20									

WELL DIAGRAM



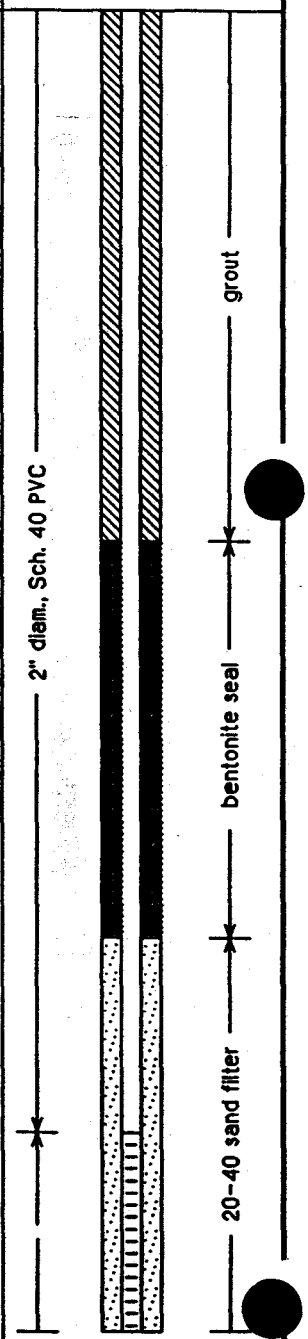
EnSafe (SM)

Monitoring Well 002G23DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1340 on 6-23-98*	TOC Elevation: *feet msl*
Completed at *1447 on 6-23-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, light olive gray, with rare clay; iron-staining, mottling, but no iron-manganese nodules (20-24').	
25								Silt, pale yellowish brown, clayey and with increased iron-staining and mottling; iron-manganese nodules to 27'.	
			3	75			ML CL	Silt, pale yellowish brown to very pale orange, with rare clay (very dry).	
30								Silt is pale yellowish brown, clayey, with sandy clay stringers. Sand fraction increasing with depth; abundant iron-manganese nodules (up to .75" long dimension); iron staining and mottling throughout. Sand fraction increasing with depth to around 34'.	
35							SM SC	Sand and gravels mixed with light gray clayey silt to around 37'.	
			4	75			CL	Sandy clay, pale yellowish brown, with gravel (medium grain size), iron-stained, and carbonaceous matter. Sand fraction increasing with depth to a clayey sand and increasing gravel fraction.	
40									

WELL DIAGRAM



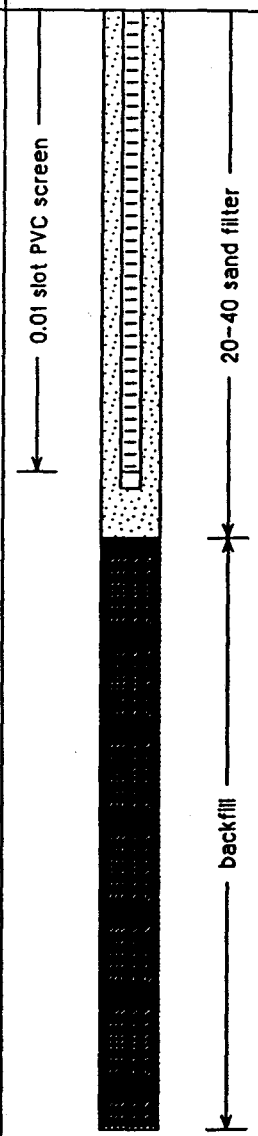
EnSafe

Monitoring Well 002G23DA

Project: *NSAMEM, SWMU 2*	Location: *NSA Memphis, Millington, TN*
Project No.: *0106-001*	Surface Elevation: *feet msl*
Started at *1340 on 6-23-98*	TOC Elevation: *feet msl*
Completed at *1447 on 6-23-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *57 feet*
Geologist: *David E. Ladd*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							CL	Gravel layer at 40.5', with abundant sand and clay to 41.5'.	
45							SC	Clayey sand, with gravel, iron-stained to around 42.5'. Sand, very fine to fine, shows abundant iron-staining, no gravel fraction present. Very abundant iron-staining (to a somewhat black color) ~ 2' thick. Clay fraction increases, mottled with some light gray clay and rare silt.	
			5	100			ML	(47-50.5') Sandy silt, very fine, dark yellowish brown (iron-stained), mottled with aple yellowish brown clayey silt.	
50							CL	Silt clay, dusky yellowish brown, micaceous, and rare sand, very fine. Top of Cockfield Formation @ 50.5'.	
55								Clay, olive black in color; micaceous.	
			6	100				***Total depth of well = 57' bgs.***	
60									

WELL DIAGRAM



(002GM01DA)

LITHOLOGIC LOG FOR MONITOR WELL GM-1

Description	Depth (ft)	Thickness (ft)
Clay, road soil, brown.....	0 - 2.5	2.5
Clay, firm, green and yellow.....	2.5 - 8.5	6.0
Clay, pliable, brown.....	8.5 - 10.0	1.5
Clay, pliable, soft, marbled, brown, yellow, green.....	10.0 - 14.5	4.5
Clay, pliable, blue.....	14.5 - 35.0	20.5
Clay, slightly sandy, medium pack, blue...	35.0 - 37.0	2.0
Clay, slightly sandy, gravel, medium pack blue.....	37.0 - 44.0	7.0
Sand, coarse grain, gravel, loose pack, tan and brown.....	44.0 - 50.0	6.0

LITHOLOGIC LOG FOR MONITOR WELL GM-2

(002GM02DA)

Description	Depth (ft)	Thickness (ft)
Clay, pliable, brown and gray.....	0 - 12.5	12.5
Clay, pliable, blue.....	12.5 - 17.5	5.0
Clay, pliable, silty, blue.....	17.5 - 22.5	5.0
Clay, pliable, sandy, medium grain, gray..	22.5 - 27.5	5.0
Clay, soft, sandy, fine grain, dark gray..	27.5 - 30.0	2.5
Sand, medium grain, clayey, dark gray.....	30.0 - 38.0	8.0
Sand, medium to coarse grain, gravel, tan.	38.0 - 46.0	8.0
Clay, soft, tan.....	46.0 - 48.0	2.0

GERAGHTY & MILLER, INC.

plastic = bentonite

WELL LOG

PROJECT: NAS - Memphis DATE: 12-7-84 SHEET: 1 OF

LOCATION: Millington TN DRILLING CONTRACTOR: Gamco Drilling

WELL NUMBER: GM-1 (landfill upgradient) DRILLING METHOD: Solid Stem Auger

SAMPLE DESCRIBED BY: DC SAMPLING METHOD: Sample off flights

SAMPLE DESCRIPTION	blow/ft	DEPTH INTERVAL (FEET)	THICKNESS (FEET)
Clay road soil, ~~FILL~~, plastic, brown		0 - 2.75'	
Clay, firm, marbled greens and yellows		2.5 - 4.0	
Same as above		4.0 - 7.0	
" "		7.0-8.5	
Clay, plastic, soft, brown		8.5-10	
Clay plastic, soft, moist, marbled brown, yellow, grey		10 - 11.5	
Clay, same as above		11.5 - 13.0	
Clay, very plastic, slightly silty, moist, brown, yellow, grey		13 - 14.5	▽
Clay, ~~plastic~~ dense, silty, blue		14.5-16.0	
Same as above		16-17.5	
Same as above		17.5 - 19.0	
Same as above		19.0 - 20.5	
" " "		20.5 - 22	
"		22 - 24.5	
"		24.5 - 29.0	
Same as above but very dry		29 - 35	
Slightly sandy clay, medium pack, moist, blue.		35-37	
Same as above but gravelly	—	37-42	
Gravel and sand, coarse grain, loose pack, tan + brown		42-44	
Sand, coarse grain, gravelly, loose pack		44 - 49.50	

(P, 111) - 1

	Theory	actual
total depth -	50'	49'
Screen -	45-50	44-49'
Sand	43-50	42-49
clay seal	42-43	40-42
grout	0-42	-40

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: Navy - Memphis T290ME1 DATE: 6-17-85 SHEET: 1 OF ____

LOCATION: Millington TN, landfill site DRILLING CONTRACTOR: Am. Drilling

WELL NUMBER: GM-2 DRILLING METHOD: solid stem auger

SAMPLE DESCRIBED BY: BJS SAMPLING METHOD: sample off flights

SAMPLE DESCRIPTION	blow/ft	DEPTH INTERVAL (FEET)	THICK (FE
Clay, pliable, brown and gray		0 - 2.5'	
same as above		2.5' - 7.5'	
same as above		7.5' - 12.5'	
Clay, pliable, blue; moist water level @ 13 ft.		12.5 - 17.5'	
Clay, plastic, silty, blue		17.5' - 22.5'	
Clay, sandy, plastic, gray; sand, medium-grained, gray.		22.5 - 27.5'	
Clay, sandy (fine grained) soft, dark gray:		27.5 - 30'	
Sand, medium-grained, clayey, dark gray.		30 - 32.5'	
same as above		32.5 - 36'	
Sand, medium to coarse-grained, tan; gravel.		36 - 38'	
same as above		38' - 46'	
Clay, soft, cream to tan		46 - 48	
Screen 44 - 39'			
Sand 44 - 36'			
bentonite 36' - 35			
grout 35' - 0'			

LITHOLOGIC LOG FOR MONITOR WELL GM-3
(002GM03DA)

Description	Depth (ft)	Thickness (ft)
Soil, organic, slightly clayey, brown.....	0.0 - 5.0	5.0
Clay, firm, green and yellow.....	5.0 - 10.0	5.0
Clay, firm, silty, green and yellow.....	10.0 - 13.0	3.0
Clay, very silty, slightly sandy, gray and yellow.....	13.0 - 15.0	2.0
Clay, pliable, blue-gray with yellow.....	15.0 - 20.0	5.0
Clay, pliable, blue-gray.....	20.0 - 30.0	10.0
Sand, silty, clayey, gray.....	30.0 - 32.0	2.0
No Sample.....	32.0 - 35.0	3.0
Sand, medium to coarse grain, tan.....	35.0 - 47.0	12.0

LITHOLOGIC LOG FOR MONITOR WELL GM-4
(002GM04UA)

Description	Depth (ft)	Thickness (ft)
Soil, organic, medium pack, brown.....	0. - 2.5	2.5
Soil, slightly clayey, pliable, brown-gray.....	2.5 - 4.0	1.5
Clay, pliable, brownish-gray with yellow..	4.0 - 7.5	3.5
Clay, pliable, medium to dense pack, green.....	7.5 - 12.5	5.0
Clay, pliable, silty, green and gray.....	12.5 - 17.5	5.0
Clay, pliable, silty, medium pack, blue-gray.....	17.5 - 22.5	5.0

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: NAS Memphis DATE: 12-14-84 SHEET: 1 OF ____

LOCATION: Millington Southside landfill (GM-3) DRILLING CONTRACTOR: [illegible]

WELL NUMBER: GM-3 DRILLING METHOD: Mud [illegible]

SAMPLE DESCRIBED BY: DG SAMPLING METHOD: Wash

SAMPLE DESCRIPTION Shelby at 12' & 32'	Blow/ft	DEPTH INTERVAL (FEET)	THICKNESS (FEET)
* see log of GM-1 for details			
Soil, slightly clay, brown		0-5'	
Clay, medium grain, green & yellow		5-10'	
~~body sample~~ clay, same as above but silty		10-13'	
Shelby tube		~~[illegible]~~ 13-15	
clay, plastic, ~~[illegible]~~ blue gray w/ yellow streaks		15-20'	
~~blue gray clay~~		20-25	
~~Same as above~~		25-30	
Shelby tube - slightly sandy clay		30-32	
No sample		32-35	
Sand, medium to coarse grain, traces of lignite, ~~[illegible]~~		35-40	
same as above		40-~~42~~ 47	

	Thesis	Thesis actual	actual
total depth	~~[illegible]~~	47	45 ~~[illegible]~~
sand	40-45	42-47	40-45 ~~[illegible]~~
silt	37-45	39-47	37-45 ~~[illegible]~~
clay	36-37	34-35	37-38 ~~[illegible]~~
grout	0-38	0-35	0-37 ~~[illegible]~~

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: NAS Memphis DATE: 12-15-84 SHEET: 1 OF

LOCATION: Southside landfill DRILLING CONTRACTOR: Geraghty

WELL NUMBER: GM-4 shallow DRILLING METHOD: Solid Auger

SAMPLE DESCRIBED BY: DG SAMPLING METHOD: off auger flight

SAMPLE DESCRIPTION	blow/ft	DEPTH INTERVAL (FEET)	THICKN (FEE
Soil, granular, medium pack, brown, (dirt)		0 - 2.5	
soil, slightly clay, pliable, brown - gray		2.5 - 4.0	
clay, pliable, fine grain, brownish-gray with yellow streak		4.0 - 7.5	
clay, fine grain, pliable, medium to dense pack, blue green		7.5 - 12.5	
same as above but w/ gray lenses, silty and ↑ moisture		12.5 - 17.5	
same		~~17.5~~	
clay, fine grain, silty, pliable, medium pack, gray-blue		17.5 - 22.5	

	actual
total depth	22
screen	17 - 22
filter pack	12 - 22
clay seal	11 - 12
cement	0 - 11

LITHOLOGIC LOG FOR MONITOR WELL GM-5

(002GM05DA)

Description	Depth (ft)	Thickness (ft)
Soil, slightly clayey, medium pack, brown.....	0.0 - 5.0	5.0
Clay, pliable, marbled green, yellow, brown.....	5.0 - 20.0	15.0
Clay, silty, hard, gray and yellow.....	20.0 - 25.0	5.0
Clay, hard, blue-gray.....	25.0 - 40.0	15.0
Sand, course to fine-grained, brown-green.....	40.0 - 45.0	5.0
Sand, course to fine-grained, gravel, brown-green.....	45.0 - 50.0	5.0

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: NAS Memphis DATE: 12-15-54 SHEET: 1 OF ____

LOCATION: GM-5 at Scrubbing [illegible] DRILLING CONTRACTOR: [illegible]

WELL NUMBER: GM-5 DRILLING METHOD: Mud rotary

SAMPLE DESCRIBED BY: DG SAMPLING METHOD: Wash Sampling

SAMPLE DESCRIPTION	blow/ft	DEPTH INTERVAL (FEET)	THICK (F
Soil, slightly clayey, medium peat. brown		0-5	
Clay, of the green-yellow-brown ~~[illegible]~~ top		5-10	
Clay, firm peat same color as above		10-15	
same as above		15-20	
clay, silty, dense peat, gray w/ yellow streak		20-25	
clay. blue gray top		25-30	
same as above		30-35	
same as above		35-40	
Sand, fine to coarse, trace of lignite, brown-green		40-45	
same as above but w/ gravel		45-50	

	Theory	actual
total depth	47'	57
screen	42-47	42-57
filter pack	35-47	48-57
clay seal	30-35	-48
grout	0-30	

LOG OF BORING 002G17UA

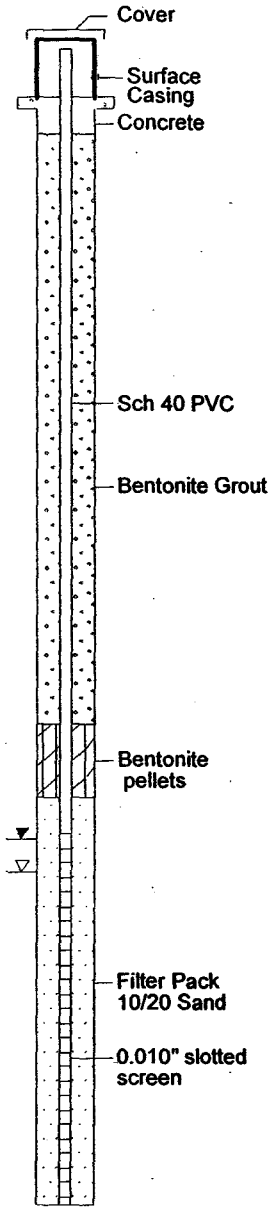
NSA MID-SOUTH
Millington, TN.

Location: SWMU 2 Offsite
Project #: CTO 0106

Started	: 8/18/99@1000	Northing	: 382425
Finished	: 8/18/99@1130	Easting	: 816037
Drilling Method	: HSA	TOC Elevation	: 262.5
Drilling Company	: U.S.G.S.	Total Depth	: 30 feet
Geologist	: J. Carmichael	Well Screen	: 20 to 30 feet

Depth in Feet	Surf. Elev. 262	Samples	% Recovery	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	262						(0-15') Silt, trace clay, dark yellowish brown, moist
		1					
5	257						
		2					
10	252						
		3					Becoming more moist at ~13'
15	247					ML	(15-25') Silt, trace clay, olive gray, moist
		4					
20	242						(20-25') Trace calcareous nodules and wood fragments; possibly saturated at ~21'
		5					
25	237						(25-30') Becoming dusky brownish gray at ~28'; calcareous (snail) shell fragments; moist to wet (no water in augers)
		6					
30	232						
35							

Well: 002G17UA
Elev.: 262.5



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11-05-2001

SWMU 3

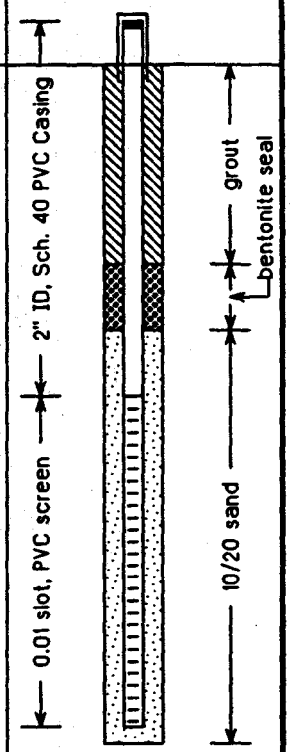
EnSafe/Allen & Hoshall

Monitoring Well 03MW01LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 - Building N-121*
Project No.: *N0094*	Surface Elevation: *286.43 feet msl*
Started at *0830 on 1-25-95*	TOC Elevation: *287.85 feet msl*
Completed at *0930 on 1-25-95*	Depth to Groundwater: *9.21 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *277.22 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *William Parks*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, clayey, yellowish brown and moderate gray; mixed, moist.	
5			1	40	BG			Clay, silty, moderate gray to brownish gray, moist.	
10							ML		
			2	22	BG			Silt, yellowish brown with yellowish orange, moist.	
15			3	125	BG			Silt, yellowish brown with yellowish orange, contains small iron or manganese nodules associated with the staining.	
20			4	125	BG			Boring terminated at 20'. 6" sump at bottom of screen.	266.4
								BG = Background	
25									
30									
35									
40									

WELL DIAGRAM



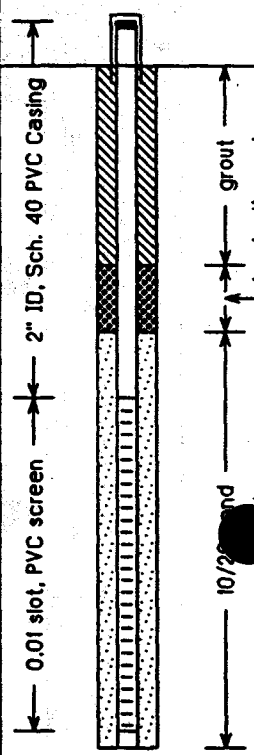
EnSafe/Allen & Hoshall

Monitoring Well 03MW02LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 - Building N-121*
Project No.: *N0094*	Surface Elevation: *286.20 feet msl*
Started at *1300 on 1-25-95*	TOC Elevation: *289.37 feet msl*
Completed at *1330 on 1-25-95*	Depth to Groundwater: *9.60 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *279.77 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *William Parks.*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Soil and fill.	
								Silt , yellowish brown, moist.	
5			1	70	BG			Silt yellowish brown to yellowish gray, stained yellowish orange, moist to wet.	
10			2	60	BG		ML	Silt, yellow brown to yellow gray, moist; contains some small iron or maganese nodules.	
15			3	110	BG			Silt, yellowish brown to moderate gray (mottled). Wet at 15'-16' becoming uniformily moderate gray below 17'.	
20			4	100	BG			Boring terminated at 20'. 6" sump at bottom of screen.	266.2
								BG = Background	
25									
30									
35									
40									

WELL DIAGRAM



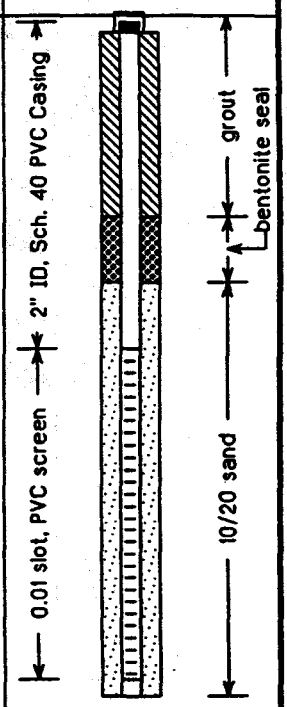
EnSafe/Allen & Hoshall

Monitoring Well 03MW03LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 – Building N-121*
Project No.: *N0094*	Surface Elevation: *285.23 feet msl*
Started at *1600 on 1-25-95*	TOC Elevation: *285.04 feet msl*
Completed at *1700 on 1-25-95*	Depth to Groundwater: *16.02 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *269.02 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *William Parks*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Asphalt, soil and fill.	
								Silt, yellowish brown mottled yellowish gray, moist.	
			1	75	BG			Silt yellowish brown mottled yellowish gray, moist, contains some iron or manganese nodules.	
5									
			2	75	BG			Silt, yellowish brown mottled yellowish gray; stained yellowish orange; contains scattered iron and maganese nodules. Wet at 11'.	
10							ML		
			3	150	BG			Silt, yellowish gray, stained yellowish orange to grayish orange. orange.	
15									
			4	75	BG			Silt, light olive gray, moist. Very uniform in texture to 20'.	
20			5	75	BG				265.2
								Terminated Boring at 20'. 6" sump at bottom of screen.	
								BG = Background	
25									
30									
35									
40									

WELL DIAGRAM



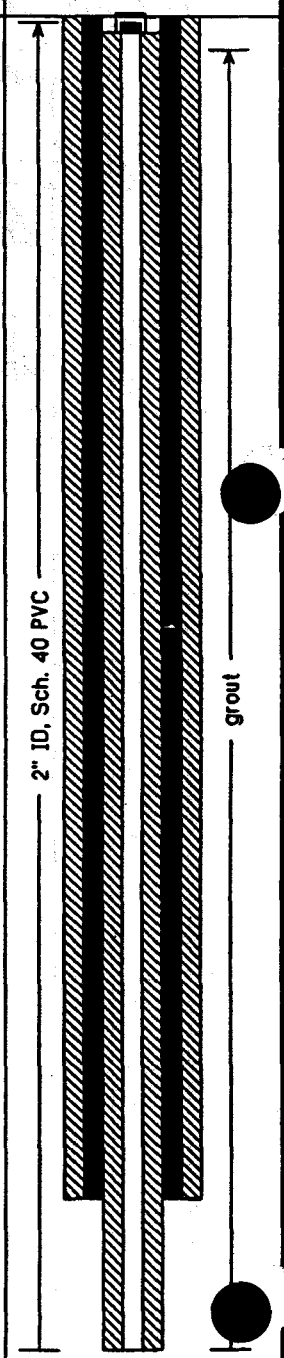
EnSafe/Allen & Hoshall

Monitoring Well 03MW03MF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 – Building N-121*
Project No.: *N0094*	Surface Elevation: *284.15 feet msl*
Started at *1020 on 1-26-95*	TOC Elevation: *286.28 feet msl*
Completed at *1430 on 1-26-95*	Depth to Groundwater: *26.17 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *260.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *85.0 feet*
Geologist: *David Ladd*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Asphalt and fill material.	
								Silt, yellowish brown to yellowish gray, locally stained dark yellowish orange. Contains iron – manganese nodules.	
			1	62.5	BG				
5									
			2	75	BG				
10									
			3	87.5	BG				
								Silt, medium dark gray to dark gray.	
15									
							ML	Silt, light olive gray to greenish gray. (Wet from 20'–23').	
20			4	112.5	BG				
25								Silt, light olive gray to pale yellowish brown, moist from 25'–30'.	
			5	100	BG				
30								Silt, light olive gray to greenish gray.	
								Silt, light olive gray to pale yellowish brown.	
35			6	100	BG			Silt, yellowish gray to light olive gray, rare iron inclusions, trace of clay, moist.	
									247.6
							SM	Sand, very fine to fine, silty, grayish orange to dark yellowish orange, trace of clay, wet. Ironstone fragments 41'.	
40									

WELL DIAGRAM



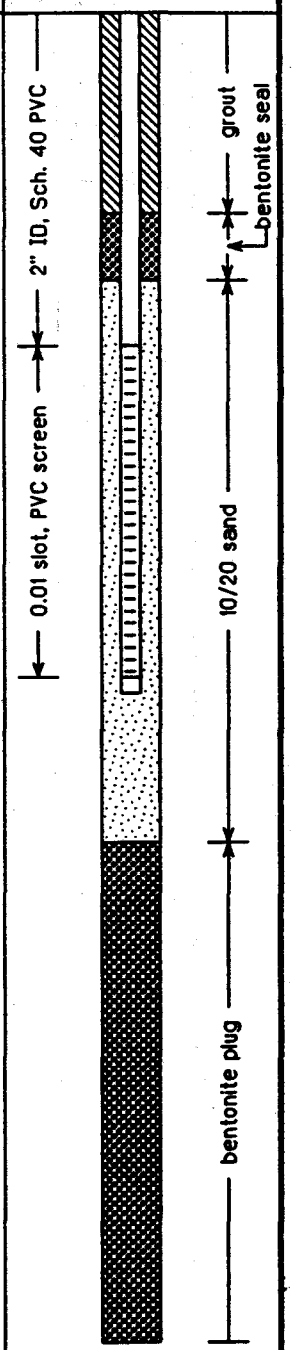
EnSafe/Allen & Hoshall

Monitoring Well 03MW03MF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 – Building N-121*
Project No.: *N0094*	Surface Elevation: *284.15 feet msl*
Started at *1020 on 1-26-95*	TOC Elevation: *286.28 feet msl*
Completed at *1430 on 1-26-95*	Depth to Groundwater: *26.17 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *260.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *85.0 feet*
Geologist: *David Ladd*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Sand, pale to dark yellowish orange, silty, wet.	
								Sand, fine, silty, brownish gray, wet.	
45			7	90	BG			Sand, fine, predominantly grayish orange. Becomes mostly dark yellowish orange from 53'-55', wet. Some gravel to an inch LD at 53'.	
50									
55			8	100	BG		SM	Sand, fine, grayish orange color approaches dark yellowish orange as you go deeper in the sample, wet. Some gravel of various sizes, throughout sample. Section with the moist gravel ~57'-60'. Silty seam from ~63'-63.5'. Some mottled gray clay ~60.5'.	
60									
65			9	95	BG			Sand, silty with gravel (same as above).	
								Sand, fine, silty, rare gravel, very light gray to yellowish gray, mottled dark yellowish orange, wet.	218.1
70							ML	Silt, sandy, some clay, soft to stiff, yellowish gray to very pale orange, mottled with dark yellowish orange, moist.	212.1
								Sand, silty, with gravel, grayish orange to dark yellowish orange, wet.	
75			10	95	BG		SP	Sand, medium to coarse, with gravel, grayish orange, wet. At 82.5 sand becomes dark yellowish orange, more gravel (predominantly chert and quartz).	
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 03MW03MF
Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 - Building N-121*
Project No.: *N0094*	Surface Elevation: *284.15 feet msl*
Started at *1020 on 1-26-95*	TOC Elevation: *286.28 feet msl*
Completed at *1430 on 1-26-95*	Depth to Groundwater: *26.17 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *260.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *85.0 feet*
Geologist: *David Ladd*	Well Screen: *50 to 60 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
	X						SP			bentonite plug
							ML		200.1	
85			11	95	BG			Silt, sandy, grayish orange to dark yellowish orange, wet.	199.1	
								Boring terminated at 85', and backfilled with bentonite chips to 60'.		
								BG = Background		
90										
95										
100										
105										
110										
115										
120										

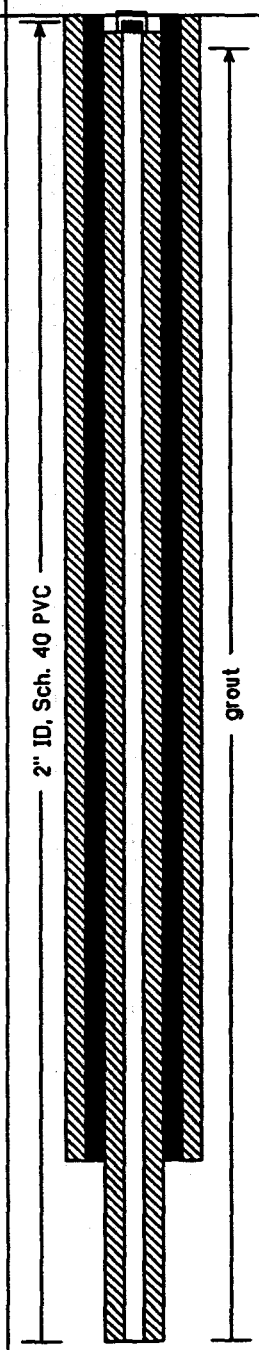
EnSafe/Allen & Hoshall

Monitoring Well 03MW04LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 - Building N-121*
Project No.: *N0094*	Surface Elevation: *284.54 feet msl*
Started at *1300 on 1-27-95*	TOC Elevation: *284.21 feet msl*
Completed at *1550 on 1-27-95*	Depth to Groundwater: *25.43 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.78 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *86.0 feet*
Geologist: *David Ladd*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Asphalt and fill material.	
								Silt, light olive gray.	
			1	87.5	BG			Clay, silty, dusky brown.	
5									
			2	87.5	BG				
10								Silt, pale yellowish brown to brownish gray, iron manganese nodules.	
			3	112.5	BG			Silt, clayey, medium light gray to brownish gray, stained locally; dark yellowish orange (12'-16' is wet).	
15									
20							ML		
			4	70	BG			Silt, clayey, brownish gray to medium light gray, stained locally; dark yellowish orange.	
25								Silt, clayey, light olive gray to greenish gray, stained locally; dark yellowish orange.	
30								Silt, clayey, light olive gray to moderate olive brown, stained; dark yellowish orange near 36'.	
35			5	104	BG			Silt, sandy, moderate olive brown to moderate yellowish brown, contains alternating layers of sand, fine to medium (1.5' layers), with a significant amount of ferruginous and manganese nodules (up to .25' in size).	
40									

WELL DIAGRAM



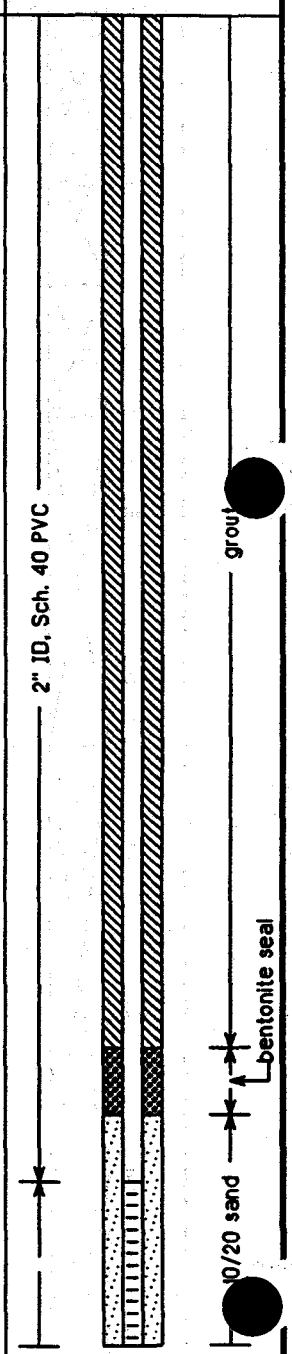
EnSafe/Allen & Hoshall

Monitoring Well 03MW04LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 – Building N-121*
Project No.: *N0094*	Surface Elevation: *284.54 feet msl*
Started at *1300 on 1-27-95*	TOC Elevation: *284.21 feet msl*
Completed at *1550 on 1-27-95*	Depth to Groundwater: *25.43 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.78 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *86.0 feet*
Geologist: *David Ladd*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	(38-43') Silt, clayey, sandy, firm, light gray to light brownish gray. Silt, sandy, light gray to medium light gray, stiff.	240
45			6	95.5	BG		SP	Sand, fine, silty, light to yellowish gray, wet. More clay from 45.5' -46.5'. Sand, fine to medium, dark yellowish gray, wet. At 47.5' color turns olive gray to light olive gray for about 2.5".	
50								Sand, fine, grayish orange to yellowish orange, wet. Rare mica and rare chert gravel. Gravel becomes scattered below 56' and abundant below 58' (Alternating layers of sandy gravel and gravelly sand).	
55			7	100	BG				
60									
65			8	115	BG			Sand, clayey, fine yellowish gray becoming stained dark yellowish orange, with disseminated lignitic particles and chert gravel, moist. Sand, fine, grayish orange to yellowish gray, with chert gravel and some lignitic clay streaks, wet; ~72'- about 4" of sandy silt.	
70									
75			9	80	BG			Sand, fine to very coarse, yellowish orange to yellowish brown, abundant chert and quartz gravel, wet. Gravel decreases in abundance below 78'. Then alternating layers of sandy gravel and gravelly sand. Turns dark yellowish orange at ~81.5'. Abundant gravel below 82.5'. At 83' color turns to olive gray to light olive gray for ~2".	
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 03MW04LF
Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 - Building N-121*
Project No.: *N0094*	Surface Elevation: *284.54 feet msl*
Started at *1300 on 1-27-95*	TOC Elevation: *284.21 feet msl*
Completed at *1550 on 1-27-95*	Depth to Groundwater: *25.43 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.78 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *86.0 feet*
Geologist: *David Ladd*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SP			
85			10	100	BG			Boring terminated at 86', then backfilled with bentonite chips to 85'.	199.5	10/20 sand
90										
95										
100										
105										
110										
115										
120										

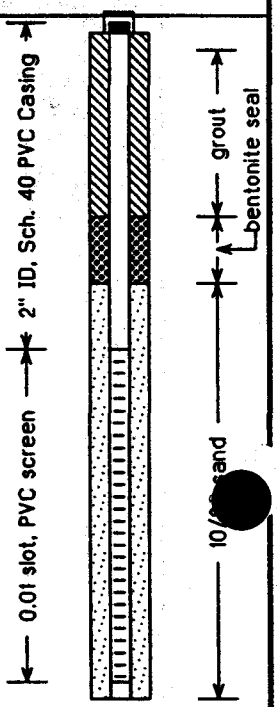
EnSafe/Allen & Hoshall

Monitoring Well 03MW04LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 - Building N-121*
Project No.: *N0094*	Surface Elevation: *284.45 feet msl*
Started at *0815 on 1-27-95*	TOC Elevation: *284.26 feet msl*
Completed at *0940 on 1-27-95*	Depth to Groundwater: *8.42 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *275.84 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Asphalt and fill.	
								Silt, slightly clayey, olive gray; small black inclusions in lower ~1' of sample; moist, crumbly to sl. stiff.	
5			1	50	BG			Silt, clayey, soft to stiff, brownish gray, some iron & orange (black) inclusions; inclusions increasing in number at ~9'.	
10			2	100	BG		ML	Silt, clayey, brownish gray to light brownish gray mottled yellowish orange grayish brown (inclusions), soft, moist.	
15								Silt, clayey, light olive gray to dark yellowish brown mottled yellowish orange (inclusions as above gone); soft to slightly stiff; wet zone soft and "goopy" from ~ 15'-16'.	
			3	113	BG			Shelby tube collected from 18'-20'.	
20			4	100	BG			Terminated Boring at 20'. 6' sump at bottom of screen.	264.5
25								BG = Background	
30									
35									
40									

WELL DIAGRAM



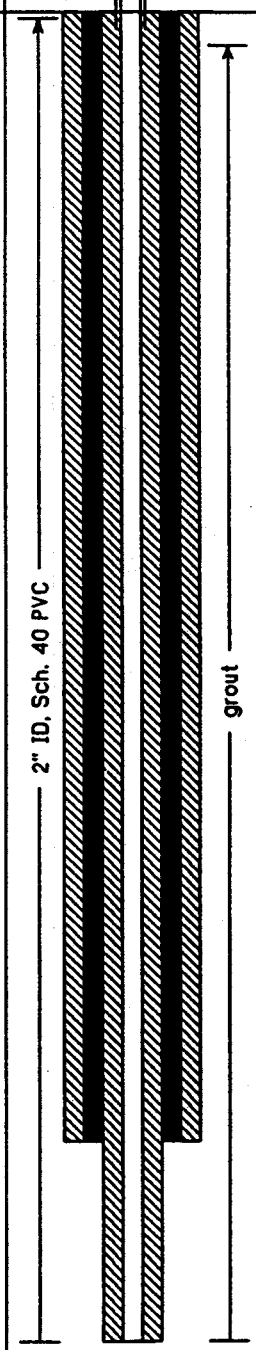
EnSafe/Allen & Hoshall

Monitoring Well 03MW05MF

Project: *NAS Memphis*	Location: *Millington, TN SWMU#3 - Building N-121*
Project No.: *N0094*	Surface Elevation: *284.15 feet msl*
Started at *1145 on 1-30-95*	TOC Elevation: *286.26 feet msl*
Completed at *1440 on 1-30-95*	Depth to Groundwater: *27.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.88 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *65.0 feet*
Geologist: *William Parks*	Well Screen: *53 to 63 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Soil and Grass.	
							ML	Fill, Silt yellowish brown mixed with chunks of moderate gray clay.	
5									278.1
							CL	Clay, olive gray to moderate gray ; contains scattered small iron and manganese nodules.	
10			1	95	BG				274.1
								Silt, yellowish-gray, stained yellowish orange. Some scattered small manganese or iron nodules present.	
15			2	92	BG				
20							ML	Silt, clayey, brownish gray, stained yellowish orange.	
25			3	95	BG			Silt, clayey, olive gray to greenish gray, stained yellowish orange.	
30								Silt, clayey, yellowish gray to yellowish brown, mottled light gray.	
35			4	80	BG				248.1
							SM	Sand, very fine, silty, yellowish brown mottled yellowish gray; contains scattered iron or manganese nodules up to one-quarter inch.	
40									

WELL DIAGRAM



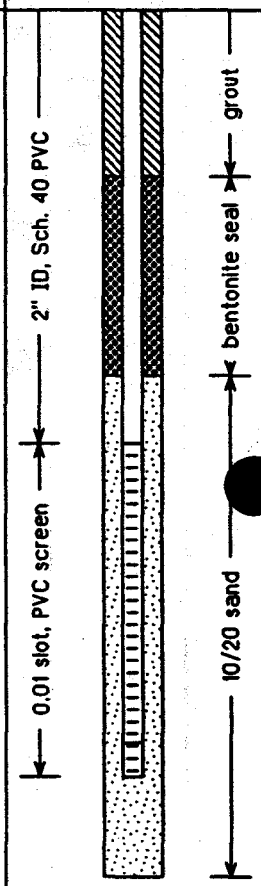
EnSafe/Allen & Hoshall

Monitoring Well 03MW05MF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#3 – Building N-121*
Project No.: *N0094*	Surface Elevation: *284.15 feet msl*
Started at *1145 on 1-30-95*	TOC Elevation: *286.26 feet msl*
Completed at *1440 on 1-30-95*	Depth to Groundwater: *27.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.88 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *65.0 feet*
Geologist: *William Parks*	Well Screen: *53 to 63 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SM		
45			5	39	BG				239.1
							SW	Sand, very fine, light gray locally, stained yellowish gray to grayish yellow, moist.	
50								Sand, fine, yellowish gray; locally stained yellowish orange, in upper one and a half feet; contains some fine mica.	
55			6	105	BG				
									225.1
60							SP	Sand and gravel, grayish yellow, stained yellowish orange, fine to coarse grained; chert and quartz gravel up to one and a half inches in diameter in longest dimension.	
65			7	120	BG				219.1
								Boring terminated at 66'.	
70								BG = Background	
75									
80									

WELL DIAGRAM



LITHOLOGIC LOG FOR MONITOR WELL GM-6

(003GM06UF)

Description	Depth (ft)	Thickness (ft)
Soil, granular, medium to firm pack, brown.....	0 - 2.5	2.5
Soil, slightly clayey, medium pack, brown.....	2.5 - 5.0	2.5
Clay, hard, dense pack, light brown.....	5.0 - 7.0	2.0
Clay, pliable, marbled brown, yellow and gray.....	7.0 - 17.0	10.0
Clay, pliable, blue-gray.....	17.0 - 21.0	4.0
Clay, pliable, marbled yellow and green...	21.0 - 22.0	1.0
Clay, hard, dense pack, amber.....	22.0 - 30.0	8.0
Clay, pliable, silty, blue-gray.....	30.0 - 32.0	2.0
Clay, dense, brittle, amber.....	32.0 - 35.0	3.0
Clay, very sandy, course grain, amber.....	35.0 - 42.0	7.0
Sand, medium grain, loose pack, light amber.....	42.0 - 52.0	10.0

GERASITY & MILLER, INC.

WELL LOG

plastic = pliable

PROJECT: NAS Memphis DATE: 12-9-84 SHEET: 1 OF

LOCATION: Millington TN DRILLING CONTRACTOR: Arrow Testing

WELL NUMBER: GM-6 upgradient of N-121 DRILLING METHOD: Solid Stem Auger

SAMPLE DESCRIBED BY: DG SAMPLING METHOD: off auger flight

SAMPLE DESCRIPTION	blows/ft	DEPTH INTERVAL (FEET)	THICKNESS (FEET)
Soil, granular, medium to firm pack, brown (dirt)		0 - 2.5	
slightly clayey soil, medium pack, brown		2.5 - 5.0	
clay, dense pack, flaky, light brown		5.0 - 7.0	
clay, dense pack, plastic, marbled - brown, yellow & grey		7.0 - 10.0	
clay, medium pack, pliable, marbled - brown yellow & grey		10 - 12.5	
same as above (moisture ↑)		12.5 - 15.0	▽
same as above but softer		15 - 17.0	▽ (perched
clay, soft, dense pack, blue (grey)		17.0 - 21	dry
clay, softer, dense pack, marbled - yellow - green		21 - 22	
clay, dense pack, brittle, amber (yellow)		22 - 27	
same as above		27 - 30	
clay, soft, pliable, blue-grey (silty)		30 - 32	
Clay, dense pack, brittle, amber		32 - 35	
Sandy clay, course grain, medium pack, amber		35 - 37	
same as above but wet		37 - 40.5	▽
sandy, clay, course grain, firm pack, marbled white & amber		40.5 - 42	
sand, medium grain, loose pack, light amber (light brown)		42 - 52	

	Thing	actual
Total Depth	50	50
screen	45-50	45-50
Sand	42-50	42-50
cement	41-42	40-42
grout	0-42	0-40

1 [illegible] reg
1 very ultralight reg
1 cool mild

LITHOLOGIC LOG FOR MONITOR WELL GM-7

(003GM07UF)

Description	Depth (ft)	Thickness (ft)
Soil, clayey, granular, brown.....	0.0 - 10.0	10.0
Clay, pliable, marbled yellow, green and brown.....	10.0 - 25.0	15.0
Clay, dense, blue-gray.....	25.0 - 45.0	20.0
Clay, silty, light gray.....	45.0 - 50.0	5.0
Sand, medium to fine grain, tan.....	50.0 - 65.0	15.0

LITHOLOGIC LOG OF MONITOR WELL GM-8

(003GM08LS)

Description	Depth (ft)	Thickness (ft)
Soil, granular, medium to dense pack, brown.....	0 - 3.5	3.5
Clay, hard, dense dark green.....	3.5 - 7.5	4.0
Clay, pliable, marbled yellow and gray....	7.5 - 15.0	7.5
Clay, pliable, medium pack, gray.....	15.0 - 20.0	5.0

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: NAS - Memphis DATE: 12-11-84 SHEET: 1 OF

LOCATION: Millington TN DRILLING CONTRACTOR: Geotech Testing

WELL NUMBER: GM-7 (Accompanied N-121) DRILLING METHOD: Mud rotary

SAMPLE DESCRIBED BY: DC SAMPLING METHOD: Split spoon

SAMPLE DESCRIPTION	Blow/ft	DEPTH INTERVAL (FEET)	THICKN (FEE
Shelby tube 10' 18' 33'			
** see log of GM-6 for details & GM-8 Soil,		0-5	
		5-10	
		10-12	
Clayey soil, brown			
		5-10'	
clay medium stiff brown		12-15'	
		20	
Clay		25-35	
Shelby tube		35-37	
clay of blue-gray type		37-40	
same as above		40-45	
clay, silty, light gray		45-50	
sand, medium to fine grained, tan		50-55	
same as above		55-65	

Exh. 7

	Theory	actual
Total depth	65'	60
Screen	60-65'	55-60
Filter pack	57 - 65	52 - 60
Clay seal	56 - 57	51 - 52
Grout	0 - 57	

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: NAS- Memphis DATE: 12-13 SHEET: 1 OF

LOCATION: Millington TN DRILLING CONTRACTOR: American Drilling

WELL NUMBER: GM-4 (N-121) DRILLING METHOD: Solid Stem Auger

SAMPLE DESCRIBED BY: DG SAMPLING METHOD: Sample of Auger Refusal

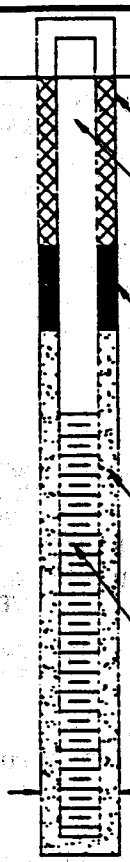
SAMPLE DESCRIPTION	blow/ft	DEPTH INTERVAL (FEET)	THICKNE (FEE
Soil, granular, medium to dense pack, brown (dirt)		0 - ~~0.25~~ - 3.5	
Clay, ~~[illegible]~~, very dense pack, dark green - brown		~~3.25~~ - 3.5 - 7.5	
clay, ~~[illegible]~~ pack, pliable, mottled yellow & gray		7.5 - 12.5	
Clay, ~~[illegible]~~, medium pliable pack, moist, gray & yellow		12.5 - 16.0	
Clay, fine grain, medium pliable pack, moist, gray		15. - 17.5	
same as above (very moist)		17.5 - 20.0	

total depth 20'
screen 15-20
Filter pack 10-20
clay seal 9-10

SWMU 5

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW01 0	1/2		0-0.5 LIGHT BROWM SAND AND SILT WITH ORGANICS AND ROOTS.
		MW01 2	1/2		0.5-2 DARK BROWN SILT AND CLAY WITH LAYERED TEXTURE. TIGHT,DRY.
		MW01 4	1/2		2-4 MOTTLED BROWN,LIGHT-BROWN,ORANGE-BROWN SILT AND CLAY WITH DARK ORGANIC SPECKS. TIGHT,DRY.
5					4-12 MOTTLED CLAY,SOME SILT BECOMING LIGHT GRAY/BROWN. TIGHT,MOIST.
		MW01 6	1/2		
		MW01 8	1/3	GRO, BTX	
10		MW01 10	1/3		● WATER AT 10-12 FT.
		MW01 12	1/3		12-18 HOMOGENOUS GRAY SILT. FIRM TO SOFT,WET
		MW01 14	1/5		
15		MW01 16	1/3		
					18-18.5 NO SAMPLE END OF BORING AT 18.5 FT.
20					
25					
30					

WELL CONSTRUCTION DETAILS



DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW STEM AUGERS
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER

DATE OF COMPLETION: 06/22/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

BORING B-01
MW-01
(FF01LS)

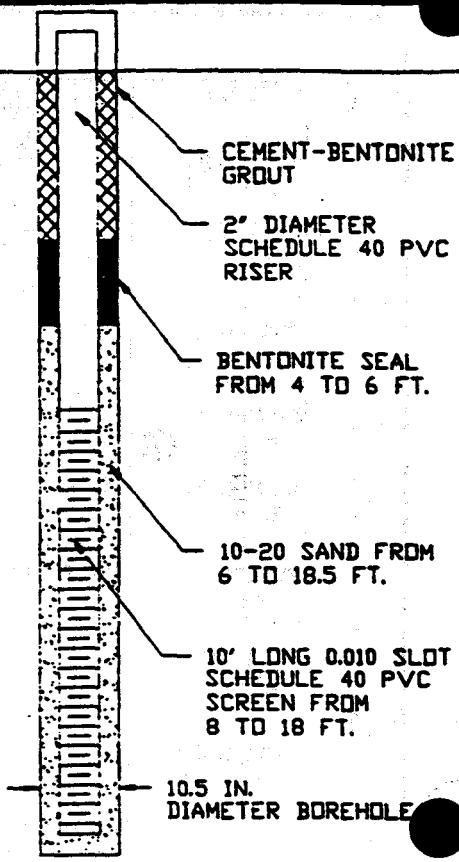
DATE: 08/08/92

DWG NAME: 026MW-01

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW02 0	1/11		0-0.5 LIGHT BROWN SAND AND SILT WITH ORGANICS AND ROOTS.
		MW02 2	28/25		0.5-2 MOTTLED BROWN, ORANGE-BROWN SILT AND CLAY. TIGHT,DRY.
		MW02 4	100/200		2-5 MOTTLED BROWN, ORANGE-BROWN, GREEN-GRAY SILT AND CLAY WITH FEW BLACK ORGANIC SPECKS. TIGHT,MOIST,WITH HYDROCARBON ODOR.
5		MW02 6	100/NH*	K, GRO, BTX RFI-SCAN	
		MW02 8	100/NH*		
10		MW02 10	200/NH*	K, GRO, BTX	5-11.5 DARK GRAY HYDROCARBON-STAINED. SILT AND CLAY. TIGHT,SOFT,WET TO MOIST. STRONG HYDROCARBON ODOR.
					● WATER AT 11.5 FT.
		MW02 12	200/200		11.5-12 BROWN SAND,SOME GRAVEL AND SILT. WET,LOOSE,NO APPARENT ODOR.
		MW02 14	10/14		12-12.5 GRAY, BROWN, ORANGE-BROWN SILT AND CLAY TIGHT,MOIST TO WET.
15		MW02 16	20/11		12.5-18 HOMOGENOUS GRAY SILT. FIRM, WET. -WITH A GRAVEL ISOLATE AT 15 FT.
					18-18.5 NO SAMPLE END OF BORING AT 18.5 FT.
20					
25					
30					

* NH-NO 15 MINUTE HEADSPACE ANALYSIS.

WELL CONSTRUCTION DETAILS



DRILLER:

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.
SHELBY TUBE FOR PERMEABILITY SAMPLES.

DATE OF COMPLETION: 06/22/92 MONITORING WELL
06/27/92 SHELBY TUBE

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

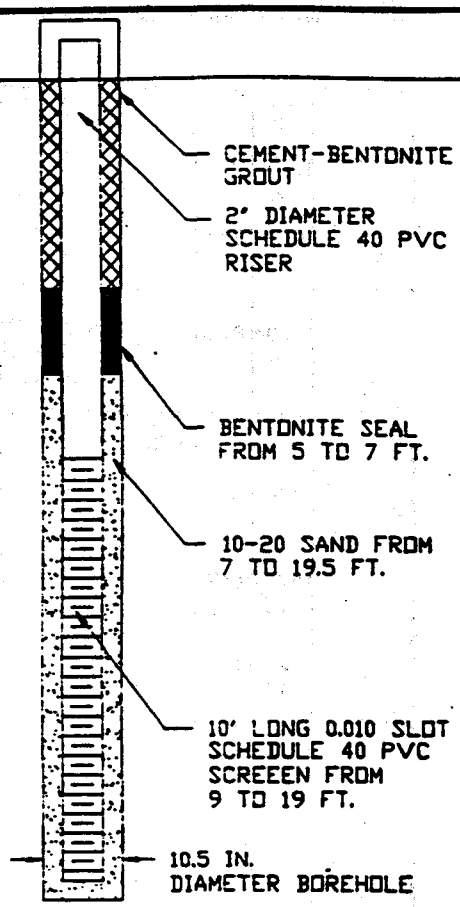
BORING B-02
MW-02
(FF02LS)

DATE: 08/08/92

DWG NAME: 026MW-02

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW03 0	3/2		0-1 BROWN SAND,SILT AND ORGANICS,SOME GRAVEL. LOOSE,DRY.
		MW03 2	2/2		1-4 BROWN, ORANGE-BROWN SILT,SOME GRAVEL AND CLAY,BECOMING (AT 4 FT.) MOTTLED BROWN, ORANGE-BROWN SILT,LITTLE CLAY.
		MW03 4	1/2		4-7 GRAY-BROWN SILT,LITTLE CLAY,BECOMING (AT 4.5 FT.) GRAY SILT AND CLAY WITH ORANGE-BROWN MOTTLING AND BLACK ORGANIC SPECKS.
5					
		MW03 6	1/2		7-10 GRADING TO DARK-GRAY CLAY, LITTLE SILT, WITH ORANGE-BROWN MOTTLES AND BLACK ORGANIC SPECKS. VERY TIGHT,MOIST.
		MW03 8	1/2		
10		MW03 10	1/2	GRO, BTX	10-12 LIGHT GRAY SILT AND CLAY WITH ORANGE-BROWN MOTTLES AND BLACK ORGANIC SPECKS. TIGHT,MOIST TO WET.
		MW03 12	1/2		● WATER AT 12 FT. 12-17 MOTTLED GRAY,BROWN,ORANGE-BROWN SILT AND CLAY,WITH BLACK ORGANIC SPECKS. SOFT,WET.
		MW03 14	1/3		
15					
		MW03 16	1/4		17- 19 BECOMING MOTTLED LIGHT-GRAY, ORANGE-BROWN SILT,WITH SCATTERED BLACK ORGANIC SPECKS.
					19-19.5 NO SAMPLE END OF BORING AT 19.5 FT.
20					
25					
30					

WELL CONSTRUCTION DETAILS



DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/23/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

BORING B-05
MW-03
(FF03LS)

DATE: 08/08/92 | DWG NAME: 026MW-03

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW04 0	3/3		0-2 BROWN SAND, SILT AND ORGANICS; BECOMING (AT 1 FT.) BROWN, ORANGE SAND AND SILT,SOME GRAVEL. LOOSE TO TIGHT,DRY TO MOIST.
		MW04 2	2/4		2-4 LAYERED BROWN, LIGHT-BROWN SILT, SOME CLAY, WITH MINOR ORANGE-BROWN MOTTLES AND BLACK ORGANIC SPECKS; BECOMING (AT 3 FT.) LIGHT-BROWN,ORANGE-BROWN SILT AND CLAY. TIGHT, MOIST.
		MW04 4	2/4		
5		MW04 6	2/3		4-6 BECOMING LIGHT-BROWN TO GRAY CLAY, WITH ORANGE-BROWN MOTTLED ZONES AND BLACK TO BROWN-DARK RED ORGANIC SPECKS.
		MW04 8	1/3	GRO, BTX	6-10 BECOMING LIGHT BROWN TO GRAY SILT AND CLAY, WITH ORANGE-BROWN MOTTLING AND DARK BROWN TO DARK RED ORGANIC NODULES.
10		MW04 10	1/2		● WATER AT 10 FT.
		MW04 12	1/3		10-15.5 BECOMING GRAY SILT,SOME CLAY,WITH ORANGE-BROWN MOTTLING AND DARK BROWN TO DARK RED ORGANIC NODULES. TIGHT,WET.
		MW04 14	1/3		
15					15.5-16.5 BECOMING MOTTLED GRAY AND ORANGE-BROWN SILT AND CLAY. TIGHT,WET.
					16-16.5 NO SAMPLE END OF BORING AT 16.5 FT.
20					
25					
30					

WELL CONSTRUCTION DETAILS

DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/23/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

BORING B-06
MW-04
(FF04LS)

DATE: 08/08/92

DWG NAME: 026MW-04

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW05 0	1/4		0-2 DARK BROWN SILT AND ORGANICS. 2-6 DARK BROWN CLAY,WITH INTERSPERSED ORANGE-BROWN NODULES. VERY TIGHT TO MOIST.
		MW05 2	2/2		
		MW05 4	1/3		
5		MW05 6	1/2		6-13 BECOMING MOTTLED BROWN-GRAY.ORANGE-BROWN SILT AND CLAY. TIGHT,MOIST TO WET.
		MW05 8	1/2	RFI-SCAN, BTX GRO, BTX	
10		MW05 10	1 / NH*		● WATER AT 10 FT.
		MW05 12	0/2		13-14.5 BECOMING DARK BROWN CLAY,LITTLE SILT, BECOMING DARK BROWN TO BLACK CLAY WITH ROOTS AND ORGANICS. VERY TIGHT.
		MW05 14	1/1		14.5-16.5 NO SAMPLE END OF BORING AT 16.5 FT.
15					
20					
25					
30					* NH-NO 15 MINUTE HEADSPACE ANALYSIS.

WELL CONSTRUCTION DETAILS

DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/24/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

BORING B-10
MW-05
(FF05LS)

DATE: 08/08/92

DWG NAME: 026MW-05

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW06 0	1/3		0-2 BROWN SILT AND SAND, SOME GRAVEL AND ORGANICS. LOOSE, DRY.
		MW06 2	1/5		2-3.5 BROWN-GRAY SILT AND CLAY, SOME ORGANICS AND ROOTS. TIGHT, MOIST.
		MW06 4	200/400		3.5-7.5 BECOMING DARK GRAY, BLACK CLAY. PLIABLE TO HARD, MOIST TO WET TO MOIST. HYDROCARBON ODOR.
5		MW06 6	1500 NH*	RFI-SCAN, GRO, BTX	7.5-10.5 BECOMING DULL GREEN-GRAY, HYDROCARBON STAINED SILT AND CLAY WITH ORANGE-BROWN MOTTLING AND MINOR DARK BROWN-RED NODULES.
		MW06 8	400/500		10.5-11 DARK BROWN-GRAY CLAY, LITTLE SILT. PLIABLE, MOIST.
10		MW06 10	3/7	GRO, BTX	11-20 MOTTLED LIGHT-BROWN-GRAY AND ORANGE-BROWN SILT, SOME CLAY, WITH BLACK ORGANIC PATCHES. WET.
		MW06 12	3/1		● WATER AT 12 FT.
		MW06 14	1/1		
15		MW06 16	0/2		
		MW06 18	1/1		
20					20-21.5 NO SAMPLE. END OF BORING AT 21.5 FT.
25					
30					* NH-NO 15 MINUTE HEADSPACE ANALYSIS.

WELL CONSTRUCTION DETAILS

DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/24/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

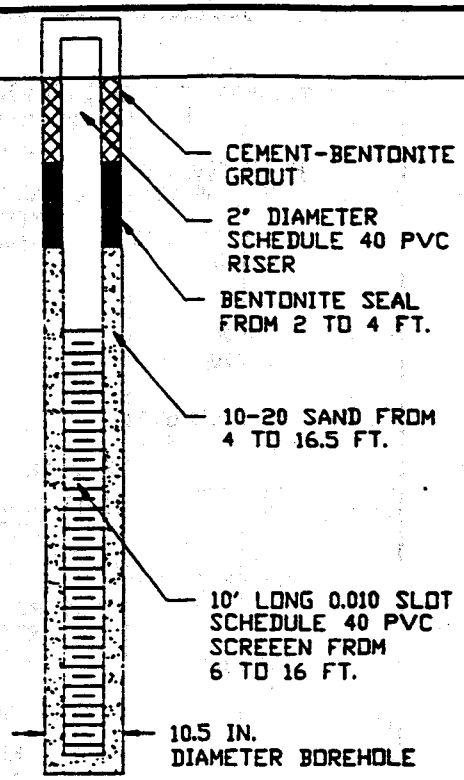
BORING B-11
MW-06
(FF06LS)

DATE: 07/29/92

DWG NAME: 026MW--06

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW07 0	2/2		0-1 BROWN SILT AND ORGANICS, SOME CLAY AND ROOTS.
		MW07 2	200/700		1-3 DARK BROWN SILT AND CLAY WITH FAINT GRAY AND ORANGE-BROWN MOTTLING, AND BLACK ORGANIC SPECKS TO RUST-BROWN NODULES. TIGHT, MOIST.
		MW07 4	250/850	GRO, BTX	3-6 BECOMING GRAY-GREEN HYDROCARBON STAINED CLAY, WITH SUBDUED ORANGE-BROWN MOTTLING AND RUST-BROWN NODULES. VERY TIGHT, MOIST, HYDROCARBON ODOR.
5		MW07 6	50/400	GRO, BTX	6-9.5 BECOMING DARK GREEN-GRAY SILT AND CLAY. TIGHT, MOIST.
		MW07 8	1/5	GRO, BTX	9.5 BECOMING DARK BROWN CLAY. WET, VERY PLIABLE. ● WATER AT 9.5 FT.
10		MW07 10	2/5		
		MW07 12	2/2		10-16 MOTTLED LIGHT-BROWN, GRAY, ORANGE-BROWN SILT, WITH DARK-BROWN, RED-BLACK NODULES. FIRM, WET.
		MW07 14	1/2		
15					16-16.5 NO SAMPLE. END OF BORING AT 16.5 FT.
20					
25					
30					

WELL CONSTRUCTION DETAILS



DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/25/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

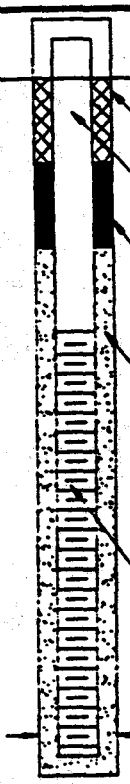
BORING B-13
MW-07
(MF07LS)

DATE: 08/08/92

DWG NAME: 026MW-07

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW08 0	1/0		0-0.5 BROWN SILT, ORGANICS AND ROOTS 0.5-2 MOTTLED LIGHT-BROWN-GRAY, ORANGE-BROWN SILT, SOME CLAY AND ROOTS. DRY.
		MW08 2	1000/1100	GRO, BTX	2-10 DARK GREEN-GRAY SILT AND CLAY. HYDROCARBON-STAINED. TIGHT, MOIST TO WET. UNIDENTIFIED ODOR.
		MW08 4	1000/1100	VOC	
5		MW08 6	500/700		
		MW08 8	10/8	GRO, BTX	
					● WATER AT 9-10 FT.
10		MW08 10	7/0		10-13 BECOMING MOTTLED GRAY, ORANGE-BROWN SILT. FIRM, WET. 13 THIN HORIZON (3") OF BLACK SILT,PASTE-LIKE,WET.
		MW08 12	200/20	VOC	13-15 MOTTLED GRAY, ORANGE-BROWN SILT;BECOMING RED -BROWN SILT WITH MINOR ORANGE-BROWN STREAKS.
		MW08 14	3/16		
15					15-16 UNIFORM GRAY SILT. 16-16.5 NO SAMPLE. END OF BORING AT 16.5 FT.
20					
25					
30					

WELL CONSTRUCTION DETAILS



DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/25/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

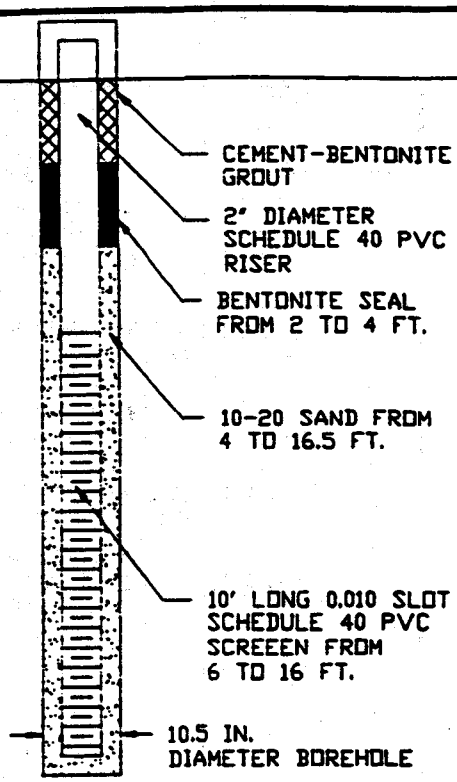
BORING B-14
MW-08
(FF08LS)

DATE: 08/08/92

DWG NAME: 026MW-08

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW09 0	0/0		0-1.5 BROWN SILT,CLAY,ORGANICS AND ROOTS; BECOMING MOTTLED BROWN,ORANGE-BROWN SILT, CLAY AND ROOTS.
		MW09 2	0/0		1.5-4 BECOMING DARK BROWN CLAY,TURNING DARK BROWN-BLACK ORGANIC-RICH CLAY WITH SOME ROOTS,TIGHT,MOIST.
		MW09 4	0/0		4-6 BECOMING GRAY SILT AND CLAY WITH FAINT ORANGE-BROWN INTERBEDS. TIGHT,MOIST.
5		MW09 6	0/0		6-10 MOTTLED GRAY-BROWN,BLUE-GRAY SILT AND CLAY. BECOMING (AT 8 FT.) MOTTLED LIGHT-BROWN AND BLUE-GRAY. TIGHT,MOIST.
		MW09 8	0/0	GRO, BTX	
10		MW09 10	0/0		● WATER AT 9.5 FT. 10-12 GRAY-BROWN SILT.
		MW09 12	0/0		12-16 MOTTLED GRAY,ORANGE-BROWN SILT,WITH MINOR BLACK TO DARK-RED NODULES OR PATCHES. FIRM,WET.
		MW09 14	0/0		
15					16-16.5 NO SAMPLE END OF BORING AT 16.5 FT.
20					
25					
30					

WELL CONSTRUCTION DETAILS



DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/26/92

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

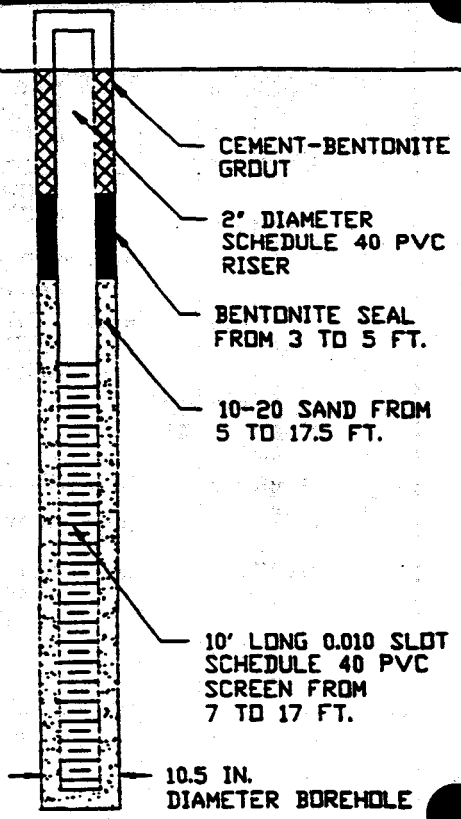
BORING B-17
MW-09
(FF09LS)

DATE: 08/08/92

DWG NAME: 026MW-09

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW10 0	0/0		0-0.5 BROWN SILT,CLAY ,AND ORGANICS
		MW10 2	12/600	GRO, BTX	0.5-2 MOTTLED BROWN,GRAY-BROWN,ORANGE-BROWN SILT AND CLAY WITH MINOR BLACK ORGANIC NODULES. FIRM,MOIST.
		MW10 4	14/600		2-4 BECOMING DARK GRAY CLAY. TIGHT,MOIST, HYDORCARBON ODOR.
5					4-6 BECOMING DARK-GREEN-GRAY,HYDROCARBON STAINED SILT AND CLAY. TIGHT,MOIST,HYDROCARBON ODOR.
		MW10 6	1/5	GRO, BTX	6-8 GREEN-GRAY SILT AND CLAY.
		MW10 8	1/0		8-10 MOTTLED GREEN-GRAY ORANGE-BROWN SILT AND CLAY.
10		MW10 10	1/0	GRO, BTX	10-12 BECOMING GREEN-GRAY SILT. FIRM,MOIST.
					● WATER AT 12 FT.
		MW10 12	1/1		12-16 MOTTLED GRAY-BROWN,ORANGE-BROWN SILT WITH BLACK TO RED NODULES OR PATCHES FIRM,WET.
		MW10 14	1/1		
15					16-17.5 NO SAMPLE. END OF BORING AT 17.5 FT.
20					
25					
30					

WELL CONSTRUCTION DETAILS



DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/26/92

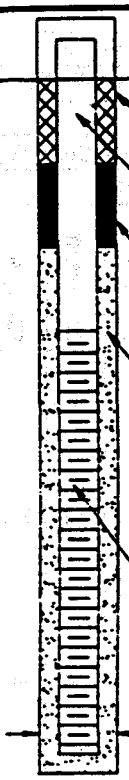
ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

BORING B-18
MW-10
(FF10LS)

DATE: 07/29/92 | DWG NAME: 026MW-10

DEPTH (FEET)	SAMPLE INTERVAL	SAMPLE NUMBER	PID (PPM) (INITIAL/15 MIN.)	LABORATORY ANALYSIS	DESCRIPTION OF SUBSURFACE MATERIALS
		MW11 0	13/10		0-1 SILT AND ORGANICS,SOME CLAY.
					1-2 INTERLAYERED BROWN,GRAY-BROWN,ORANGE-BROWN SILT AND CLAY,MINOR GRAVEL. TIGHT,MOIST.
		MW11 2	300/500		2-9 BECOMING DARK GREEN-GRAY,HYDROCARBON-STAINED SILT AND CLAY. TIGHT,MOIST,HYDROCARBON ODOR.
		MW11 4	1300/NH*	K GRO, BTX, RFI-SCAN	
5		MW11 6	500/1100		● PERCHED WATER AT 7 FT.
		MW11 8	150/300		-WITH FAINT GRAY,ORANGE-BROWN MOTTLING FROM 7 TO 10 FT.
					9-11 MOTTLED GRAY,ORANGE-BROWN SILT. FIRM,MOIST.
10		MW11 10	20/80	K, GRO, BTX	11 THIN (3" THICK) HORIZON OF ORANGE-BROWN SILT AND CLAY. EXTREMELY TIGHT AND COMPACT, DRY.
					● WATER AT ~ 11.5 FT.
		MW11 12	1/1		11-16 GRAY UNIFORM SILT. FIRM,WET.
		MW11 14	0/0		
15					16-16.5 NO SAMPLE. END OF BORING AT 16.5 FT.
20					
25					
30					* NH-NO 15 MINUTE HEADSPACE ANALYSIS.

WELL CONSTRUCTION DETAILS



DRILLER: PROFESSIONAL SERVICE INDUSTRIES, INC.
4161 RIDGEMOOR AVENUE
MEMPHIS, TN. 38118

DRILLING AND SAMPLING METHOD:
6.25-INCH ID HOLLOW-STEM AUGERS.
2 FT. LONG, 2 IN. OD SPLIT BARREL SAMPLER.

DATE OF COMPLETION: 06/26/92-MONITORING WELL
06/27/92-SHELBY TUBE

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
AIRCRAFT FIRFIGHTING TRAINING FACILITY
NAS MEMPHIS, TN.

BORING B-19
MW-11
(FF11LS)

DATE: 08/08/92

DWG NAME: 026MW-11

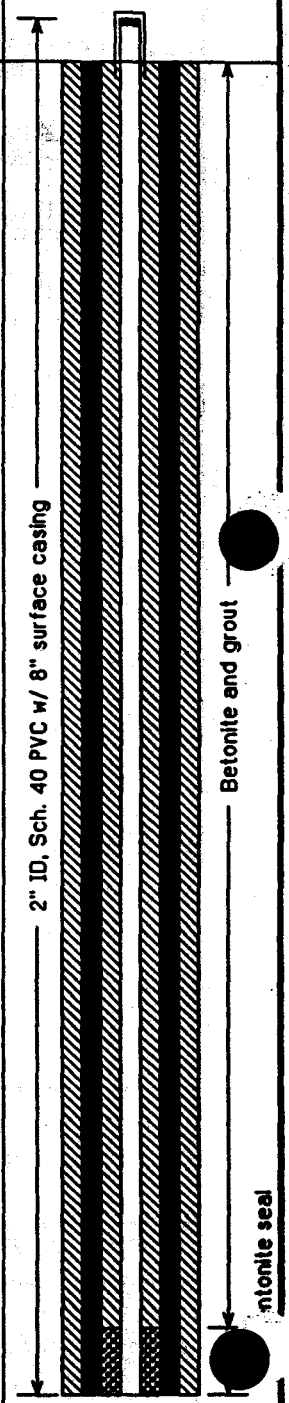
EnSafe/Allen & Hoshall

Monitoring Well 05MW01UF

Project: *NAS Memphis*	Location: *Millington, TN SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *268.64 feet msl*
Started at *0850 on 1/28/95*	TOC Elevation: *271.03 feet msl*
Completed at *0945 on 1/29/95*	Depth to Groundwater: *14.52 feet* Measured: *3/31/95.*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.51 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *52 feet*
Geologist: *David Ladd*	Well Screen: *42 to 52 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								0' to 12' Clayey silt, moderate to dark yellowish-brown. Stiff, moist. Slightly wet around 11'.	
5			1	70	BG				
10			2	107	BG				
								12' to 25' Clayey fine silt. Medium gray to medium dark gray. Sample getting darker about 16.5'. By 18' color has become medium dark gray to brownish gray. Moist. Sample becomes firm at about 21'.	
15			3	110	BG				
20							ML		
								25' to 40' Fine silt, clayey, grayish-orange very firm starting at 36'. 36' to 40' contains light gray silt seams. 25' to 31.5' transitional zone (gray silt mottled with yellowish- gray clayey silt).	
25									
30									
35									
40			4	89	BG		SP		228.6

WELL DIAGRAM



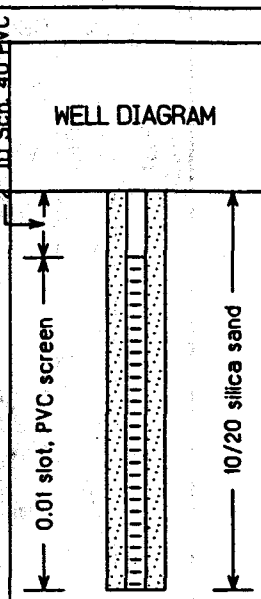
EnSafe/Allen & Hoshall

Monitoring Well 05MW01UF

Project: *NAS Memphis*	Location: *Millington, TN SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *268.64 feet msl*
Started at *0850 on 1/28/95*	TOC Elevation: *271.03 feet msl*
Completed at *0945 on 1/29/95*	Depth to Groundwater: *14.52 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.51 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *52 feet*
Geologist: *David Ladd*	Well Screen: *42 to 52 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SP	Sand, yellowish gray to pinkish gray, wet. Some gravels, increasing around 45'. Clay, fine with gravel, light gray (46'-47'), turning dark yellowish orange to moderate yellowish brown, abundant.	228.6
45									
							GP		221.6
50									
								End of soil boring at 52'. BG = Background (1.0 ppm) Set well through 8" casing and 6" boring to 52'.	216.6
55									
60									
65									
70									
75									
80									

WELL DIAGRAM



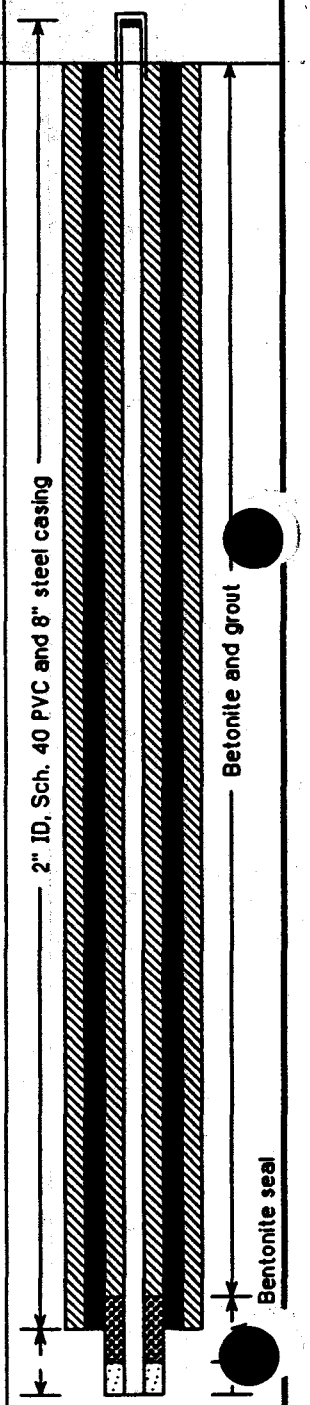
EnSafe/Allen & Hoshall

Monitoring Well 05MW02UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *267.74 feet msl*
Started at *1030 on 1/28/95*	TOC Elevation: *270.06 feet msl*
Completed at *1505 on 2/11/95*	Depth to Groundwater: *14.11 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *David Ladd/Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate yellowish brown to grayish-orange, firm. (0'-10')	
5			1	70	BG				
10			2	100	BG			(10'-30') Silt, clayey, most turns medium gray to medium dark gray. Sample loses brown at 13'. Gets increasingly darker (dark gray to brownish gray).	
15			3	110	BG				
20							ML		
25									
30								(30'-38) Clayey silt; grayish-orange to moderate yellowish-brown. Stiff. Still contains some gray silt. Silt mottled with yellowish- gray silt (30'-35').	
35									
			4	94	BG				
40							SP	Boring stopped at 1150 on 1/28/95. Boring completed and drilling resumed at 1430 on 2/11/95.	229.7

WELL DIAGRAM



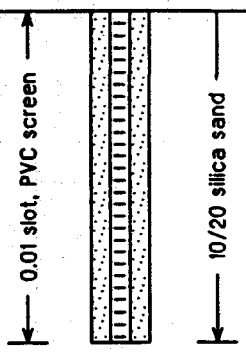
EnSafe/Allen & Hoshall

Monitoring Well 05MW02UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *267.74 feet msl*
Started at *1030 on 1/28/95*	TOC Elevation: *270.06 feet msl*
Completed at *1505 on 2/11/95*	Depth to Groundwater: *14.11 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *David Ladd/Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X							No recovery from 38'-40'.	
	X							40'to 45' Same as above.	
	X						SP		
45	X		5	71	BG			45' to 47.5' Sand, fine, occasional gravel to 1", silty, dense, yellowish-gray stained yellowish-orange. Wet.	
									220.2
							GP	47.5' to 50' Gravel, sandy, some silt; grayish-orange to dark yellowish-orange, wet.	
50			6	110	BG				217.7
								End of boring at 50'.	
55									
60									
65									
70									
75									
80									

WELL DIAGRAM



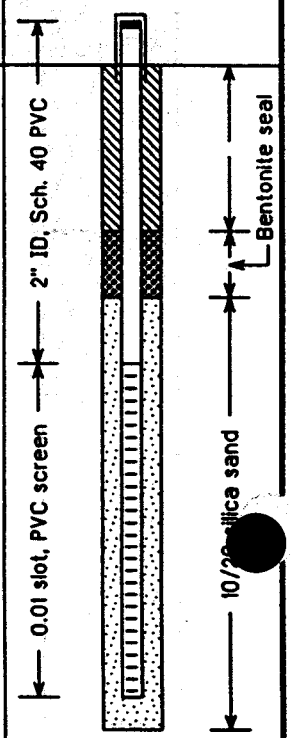
EnSafe/Allen & Hoshall

Monitoring Well 05MW03S
(005G03LS)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *265.45 feet msl*
Started at *Unknown on 2/12/95*	TOC Elevation: *267.90 feet msl*
Completed at *Unknown on 2/12/95*	Depth to Groundwater: *6.88 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *261.02 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *19 feet*
Geologist: *David Ladd/Jack Carmichael*	Well Screen: *9 to 19 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Boring information taken from 05-SB-03. Silt, clayey, moderate yellowish-brown 0' to 3.5'.	
5			1	70	BG			3.5' to 12' Clay, silty, dark gray to brownish gray. Very hard, stiff material, getting softer near bottom of sample and lighter in color. Lost most of sample from 8'-12'.	
10			2	43	BG		ML		
15			3	130	BG			12' to 19.5' silt, clayey, dark to moderate yellowish-brown. Some dark gray silty clay about 16.5' to 18. 18' to 19.5' silt, dark to moderate yellowish-brown mixed with dark yellowish-brown silt, dry.	
								19.5' to 26' silt, clayey, medium gray.	
20								End of boring at 20. Boring information taken from 05-SB-03.	245.4
25									
30									
35									
40									

WELL DIAGRAM



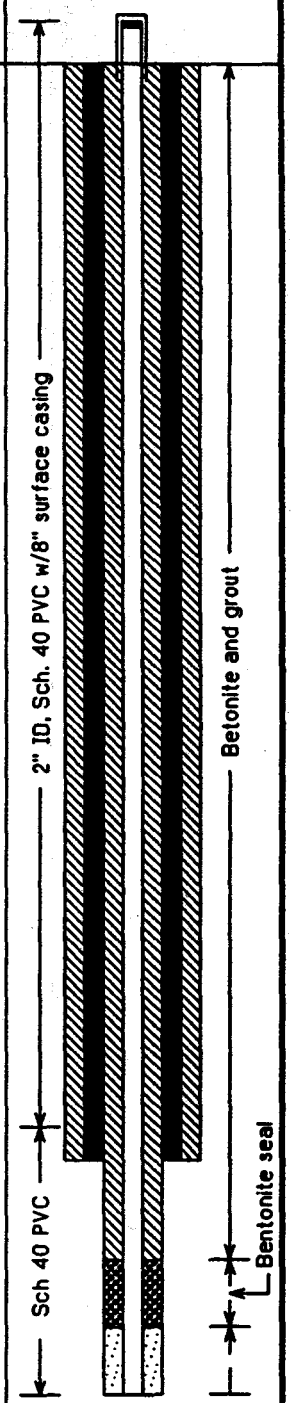
EnSafe/Allen & Hoshall

Monitoring Well 05MW03UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *265.45 feet msl*
Started at *1410 on 1/28/95*	TOC Elevation: *267.46 feet msl*
Completed at *0850 on 2/12/95*	Depth to Groundwater: *11.08 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.38 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *David Ladd/Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, clayey, moderate yellowish-brown, 0' to 3.5'.	
5			1	70	BG			3.5' to 12'Clay, silty, dark gray to brownish gray. Very hard, stiff material, getting softer near bottom of sample and lighter in color. Lost most of the sample from 8'-12'.	
10			2	43	BG				
15			3	130	BG			12' to 19.5' silt, clayey, dark to moderate yellowish-brown. Picks up some dark gray silt clay about 16.5' to 18. 18' to 19.5' silty, dark to moderate yellowish-brown mixed with dark yellowish-brown silt, dry.	
							ML		
20								19.5' to 26' silt, clayey, medium gray.	
25								26' to 36.5' Gray silt mottled with silt, dark yellowish-orange becoming much more orange at 34' to 36.5' and more clay rich.	
30									
35									229.4
			4	91	BG		SP		
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 05MW03UF
Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 – F.F.T.A.*
Project No.: *0094*	Surface Elevation: *265.45 feet msl*
Started at *1410 on 1/28/95*	TOC Elevation: *267.46 feet msl*
Completed at *0850 on 2/12/95*	Depth to Groundwater: *11.08 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.38 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *David Ladd/Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45							SP	(36.5'–50') Sand, fine to coarse, with gravel and some silt. Very gravelly zone from about 43'–45', about 1 foot clayey zone with gravel (trace) from about 45'–46'; Color ranges from very pale orange to mderate reddish brown; wet.		0.01 slot, PVC screen; 10/20 silica sand
50			5	88	BG			End of boring at 50'.	215.4	
55										
60										
65										
70										
75										
80										

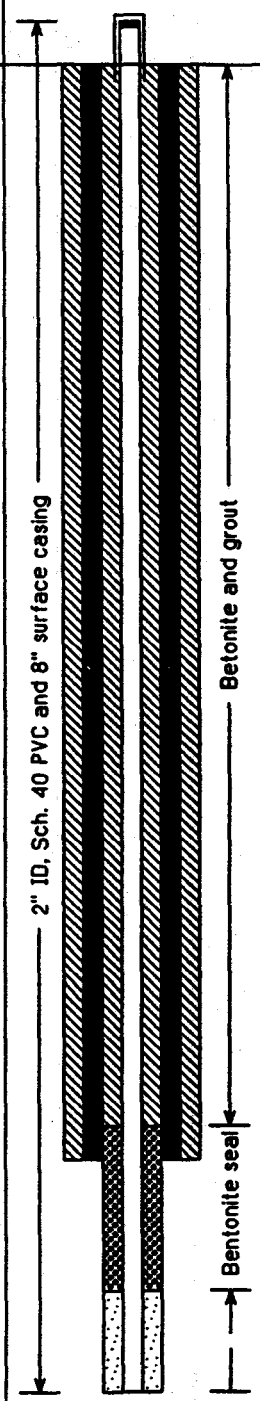
EnSafe/Allen & Hoshall

Monitoring Well 05MW04UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *266.72 feet msl*
Started at *1605 on 1/28/95*	TOC Elevation: *269.03 feet msl*
Completed at *1100 on 2/11/95*	Depth to Groundwater: *12.10 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.93 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *David Ladd/Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								0' to 3' Hand dug to 3'.	
								3' to 6' Silt, clayey, dark gray, firm, moist.	
5			1	100	100			(6'-12') Color change at 6', grayish-orange to moderate yellowish- brown.	
10			2	100	BG			Saturated 10' to 12'.	
15							ML	12' to 22' Gray clayey silt mottled with brown at 20', and becomes more clay rich and wet at 22'.	
20			3	105	BG			(22' to 27.5') Color turns medium gray.	
25								27.5' to 35' Transitional. 27.5' to 31' gray clayey silt mottled with dark yellowish-orange silt. 31' to 35' Reworked material. Dark yellowish-orange silt, iron- stained. Becoming sandy near 35', very wet.	
30									
35			4	?	BG		SW	35' to 45' Sand, fine to coarse silty with gravel; yellowish-gray to dark yellowish-orange; some 3" to 6" layers of sandy clay, light gray to yellowish-gray; wet.	231.7
40									

WELL DIAGRAM



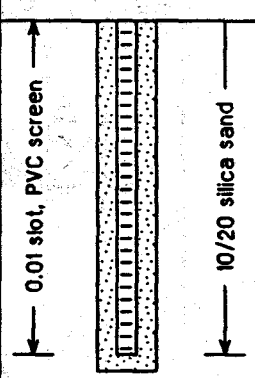
EnSafe/Allen & Hoshall

Monitoring Well 05MW04UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 – F.F.T.A.*
Project No.: *0094*	Surface Elevation: *266.72 feet msl*
Started at *1605 on 1/28/95*	TOC Elevation: *269.03 feet msl*
Completed at *1100 on 2/11/95*	Depth to Groundwater: *12.10 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.93 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *David Ladd/Jack Carmichael*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW		
							CL		223.2
45			5	85	BG			45' to 50' Sand, fine to coarse with some gravel, trace silt; pale yellowish- to dark yellowish-orange, wet.	221.7
							SW		
50			6	110	BG			End of boring at 50'.	216.7
55								BG = Background (1 ppm)	
60									
65									
70									
75									
80									

WELL DIAGRAM



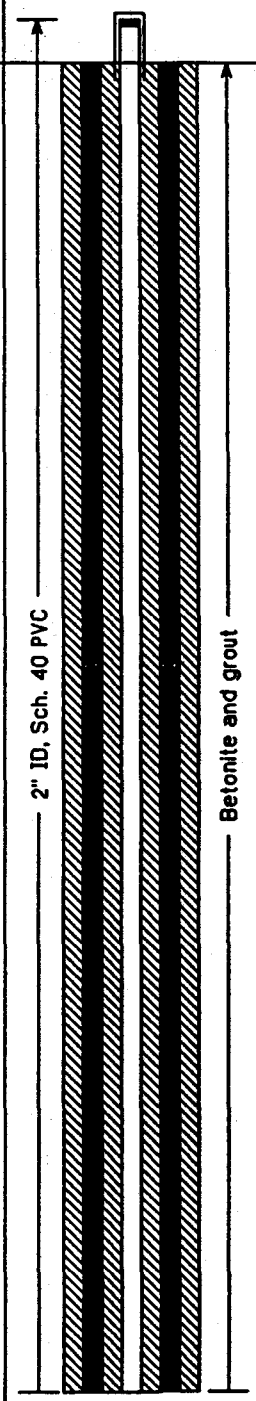
EnSafe/Allen & Hoshall

Monitoring Well 05MW05LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *268.69 feet msl*
Started at *0855 on 1/29/95*	TOC Elevation: *271.21 feet msl*
Completed at *1000 on 1/29/95*	Depth to Groundwater: *14.73 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.48 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *65.5 feet*
Geologist: *David Ladd*	Well Screen: *55.5 to 65.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								The first 40 feet of 5MW-5LF was logged from 05-SB-01 (05-MW-01UF).	
								0' to 12' Clayey silt, moderate to dark yellowish-brown. Stiff, moist. Slightly wet around 11'.	
5			1	70	BG				
10			2	107	BG				
								12' to 25' Clayey fine silt. Medium gray to medium dark gray. Sample getting darker about 16.5'. By 18' color has become medium dark gray to brownish gray. Moist. Sample becomes firm at about 21'.	
15									
20			3	110	BG		ML		
								25' to 40' Fine silt, clayey, grayish-orange very firm starting at 36'. 36' to 40' contains light gray silt seams. 25' to 31.5' (gray silt mottled with yellowish- gray clayey silt).	
25									
30									
35									
40			4	89	BG		SW		228.7

WELL DIAGRAM



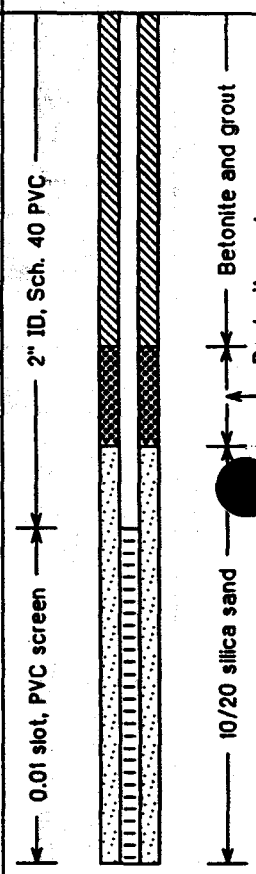
EnSafe/Allen & Hoshall

Monitoring Well 05MW05LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *268.69 feet msl*
Started at *0855 on 1/29/95*	TOC Elevation: *271.21 feet msl*
Completed at *1000 on 1/29/95*	Depth to Groundwater: *14.73 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.48 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *65.5 feet*
Geologist: *David Ladd*	Well Screen: *55.5 to 65.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									228.7
								40' to 65' Sand, yellowish gray to pinkinsh gray, wet. Some gravel, increasing at 45'.	
45			5	42	BG				
								(46' to 47') Clay, fine, with gravel, light gray.	
								(47' to 52') Turning dark yellowish-orange to moderate yellowish-brown with abundant gravel.	
50									
							SW	(52' to 53') Sand, dark yellowish-orange, amount of gravel diminishes.	
								(53' to 56') Coarse sand, grayish-orange, little gravel.	
55			6	90	BG				
								(56' to 61.5') Coarse sand, dark yellowish-orange, wet, abundant gravel.	
60									
								(61.5 to 63.5') Sand becoming lighter color.	
								(63.5' to 64.75') Coarse sand, yellowish-gray, no gravel. (64.75' to 65') Sand, moderate brown, iron-stained, large gravel.	
65			7	100	BG				203.7
								Top of Cockfield Formation Total depth of boring at 66'. First forty feet of log from MW-01-UF. Analytical samples collected from paired well MW-01-UF.	
70									
75									
80									

WELL DIAGRAM



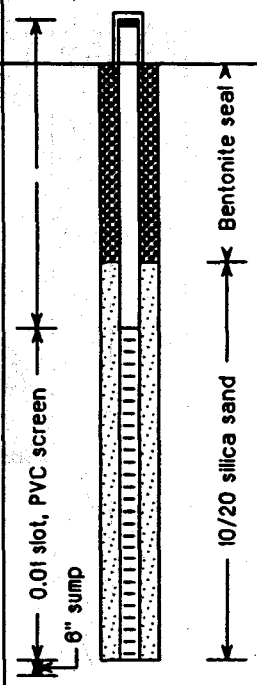
EnSafe/Allen & Hoshall

Monitoring Well 05MW06S
(005G06LS)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *264.53 feet msl*
Started at *0830 on 1/29/95*	TOC Elevation: *266.75 feet msl*
Completed at *Unknown on 1/29/95*	Depth to Groundwater: *6.73 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *260.02 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *18 feet*
Geologist: *Ben Brantley*	Well Screen: *8 to 18 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Dark yellowish-brown silt with organics (root zone 0' to 0.5').	
								0.5' to 4' Yellowish-brown clayey silt, medium stiff, moist to wet.	
5			1	100	BG			4' to 5' Olive black to brownish-black silty clay. Very hard and dry. Grading into olive gray to 6'.	
								6' to 8' Light olive gray stiff silty clay; hard.	
10							ML	8' to 15' Dusky yellow to yellowish-gray soft clayey silt (moist to wet).	
15			2	69	BG			15' to 20' Grayish-green medium stiff silt (moist); slightly clayey.	
								19' to 20' Darker gray in color.	
20			3	80	BG			Total depth of boring is 20'.	244.5
25								BG = Background	
30									
35									
40									

WELL DIAGRAM



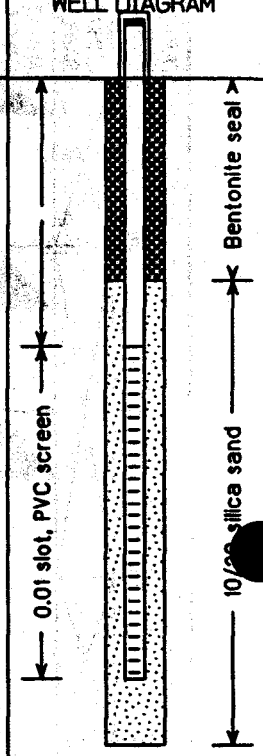
EnSafe/Allen & Hoshall

Monitoring Well 05MW07S
(005G07LS)

Project: *NAS Memphis*	Location: *Millington, TN*
Project No.: *0094*	Surface Elevation: *264.48 feet msl*
Started at *1050 on 1/29/95*	TOC Elevation: *266.87 feet msl*
Completed at *Unknown on 1/29/95*	Depth to Groundwater: *6.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *260.49 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *18 feet*
Geologist: *Ben Brantley*	Well Screen: *8 to 18 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								0' to 4.5' Moderate to pale brown clayey silt, moist, medium stiff to soft with organics.	
5			1	58				4.5' to 7' Dusky yellowish-brown silty clay. Very stiff and dry.	
								7' to 10.5' Light to dark olive gray silty clay with iron staining and organics. Very stiff and hard.	
10			2	100			ML	10.5' to 13.5' Light olive gray to brown silt. Very moist to wet. Soft.	
								13.5' to 15' Grayish-green medium stiff silt. Moist to wet.	
15			3	96				15' to 20' Grayish green medium stff silt. Moist to wet. Small snail shells present.	
20			4	100				End of boring.	244.5
25									
30									
35									
40									

WELL DIAGRAM



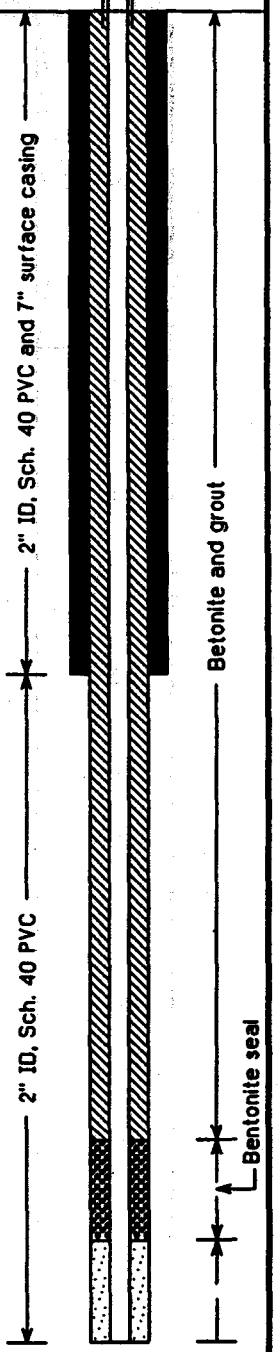
EnSafe/Allen & Hoshall

Monitoring Well 05MW04AUF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *266.93 feet msl*
Started at *0840 on 2/26/95*	TOC Elevation: *269.13 feet msl*
Completed at *Unknown on 2/26/95*	Depth to Groundwater: *13.81 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.85 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *Ben Brantley*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								0' to 3.5' Brownish black stiff silty clay.	
5			1	100	5.8			3.5' to 8' Greenish gray silt clay. Fuel odor.	
10								8' to 13.5' Yellowish-brown to light olive gray with organics. Clayey silt. Medium stiff to soft; moist.	
15			7	93	BKG		ML	13.5' to 15' Dusky yellow with light olive gray and light gray clayey silt.	
20								15' to 21' Light olive gray with iron (orange streaks) clayey silt. Medium stiff to soft. Moist.	
25			11	120	BKG			21' to 25' Light olive gray silt with dusky yellow streaks. Dry and friable.	
30								25' to 33' Light olive gray to pale yellowish-brown clayey silt. Yellowish orange silt nodules at 25' to 25.5'. Medium stiff to stiff.	
35			12	80	BKG		SP	(33'-34') Fine sandy silt. (Same Color). Medium stiff to soft. Moist. 34' to 35' Yellowish-orange fine to medium silty clayey sand.	233.9
								35' to 39.5' Yellowish-orange to light brown medium sand.	227.9
40							CL SW	39.5' to 40' Very light gray sandy stiff clay.	226.9

WELL DIAGRAM



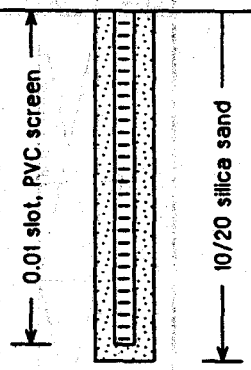
EnSafe/Allen & Hoshall

Monitoring Well 05MW04AUF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 – F.F.T.A.*
Project No.: *0094*	Surface Elevation: *266.93 feet msl*
Started at *0840 on 2/26/95*	TOC Elevation: *269.13 feet msl*
Completed at *Unknown on 2/26/95*	Depth to Groundwater: *13.81 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.85 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *Ben Brantley*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									226.0
							SW	40' to 45' Yellowish-orange coarse to very coarse gravelly sand. Chert gravel up to 1".	
45							CL	45' to 45.5' Yellowish-gray sandy clay. Medium stiff to soft.	221.9 / 221.4
							SW	45'.5 to 50' Grayish-orange and yellowish-gray and yellowish- orange medium sand.	
50			13	93	BKG				216.9
								End of boring	
								BG = Background	
55								*Steel surface casing was driven to a depth of 20' bgs.*	
60									
65									
70									
75									
80									

WELL DIAGRAM



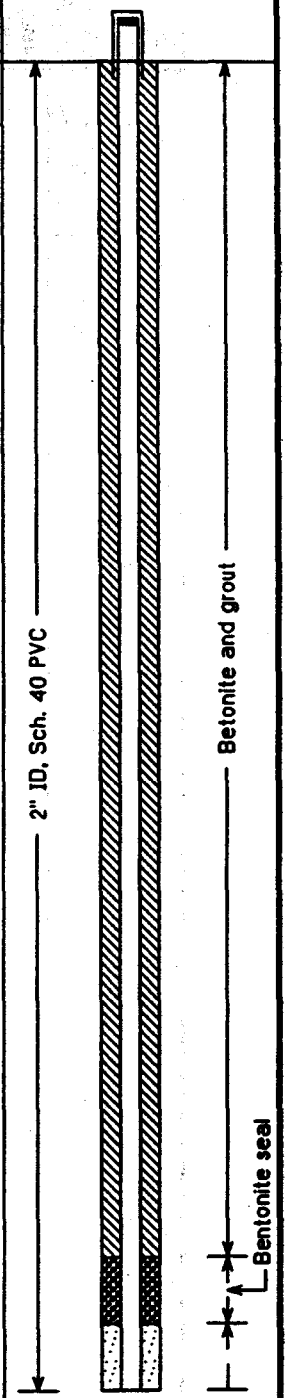
EnSafe/Allen & Hoshall

Monitoring Well 05MW04BUF

Project: *NAS Memphis*	Location: *Millington, TN SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *266.74 feet msl*
Started at *1515 on 2/26/95*	TOC Elevation: *268.76 feet msl*
Completed at *Unknown on 2/26/95*	Depth to Groundwater: *11.80 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.96 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *Ben Brantley*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								0' to 6.5' Browninsh-black stiff silty clay with organics.	
5	X		1	100	NR				
								6.5' to 9' Greenish-gray moist silty clay.	
10	X		2	100	NR			9' to 15' Yellowish-brown to dusky yellow and light olive gray clayey silt; with organics. Faint traces of greenish-gray extending to 13.5'.	
15	X		3	80	NR		ML	Silt, medium dark gray, clayey silt from 15' to 17'.	
								Light olive gray with iron-staining and organics 17' to 25'. Clayey silt.	
20								Light olive gray silt with dusky yellow streaks to 25'.	
25			4	80	NR			Light olive gray to pale yellowish-brown clayey silt 25' to 31'.	
30									
								Pale yellowish-brown sandy silt 31' to 33'.	235.7
								Yellowish-orange to grayish-orange fine to medium sand 33' to 40'.	
35							SP		
40							CL		226.7

WELL DIAGRAM



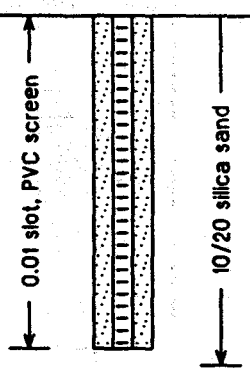
EnSafe/Allen & Hoshall

Monitoring Well 05MW04BUF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#5 - F.F.T.A.*
Project No.: *0094*	Surface Elevation: *266.74 feet msl*
Started at *1515 on 2/26/95*	TOC Elevation: *268.76 feet msl*
Completed at *Unknown on 2/26/95*	Depth to Groundwater: *11.80 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.96 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50 feet*
Geologist: *Ben Brantley*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							CL	6" clay lenses at 40' and 45'. Yellowish-orange to grayish-orange coarse to very coarse gravelly sand.	228.2
							SW		
45			5	80	NR		CL	Clay at 45' (6" thick); maroon mixed with gray.	221.7 / 221.2
							SW	Grayish-orange to yellowish-orange medium sand.	
50			6	80	NR			End of boring.	216.7
55									
60									
65									
70									
75									
80									

WELL DIAGRAM



ENSAFE

BORING LOG of 005G08LF

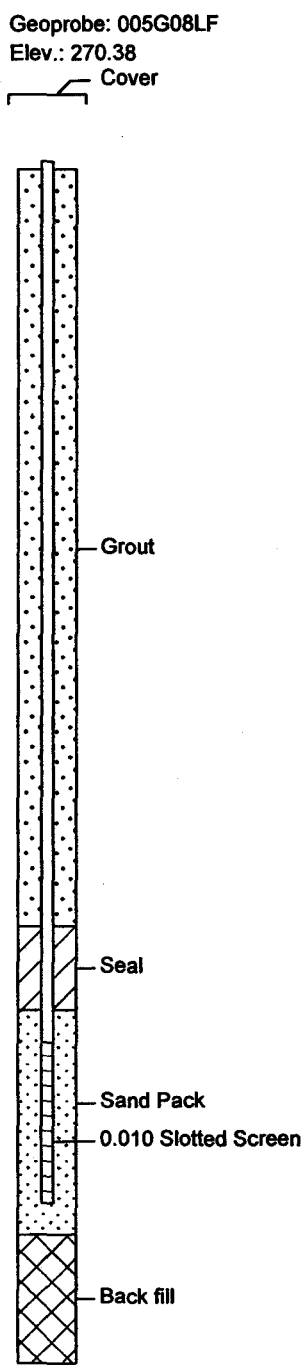
NSA MIDSOUTH
Millington, TN.

Location: SWMU 5
Project #: CTO 0094

Started	: 1015 8/5/98	Northing	: 390003.80
Finished	: 1530 8/5/98	Easting	: 811521.80
Drilling Method	: Rotasonic	TOC Elevation	: 270.38
Drilling Company	: Allinance Drilling	Total Depth	: 75 feet
Geologist	: B. Brantley	Well Screen	: 55 to 65 feet

Geoprobe: 005G08LF
Elev.: 270.38

Depth in Feet	Surf. Elev. 267.89	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	267	1	60	0.2		ML	(0 - 3) Med. yellowish brown silt mixed w/ Lt. olive gray silt, dry, med. stiff (3 - 11.5) no recovery (11.5 - 13.5) Grayish green silt, wet, med. stiff, petroleum odor (13.5 - 18.5) Med. yellowish brown w/ Lt. olive brown silt, moist to wet, med. stiff (18.5 - 23.5) Olive gray clayey silt, moist, stiff (23.5 - 26.5) Olive gray clayey silt mixed w/ Lt. olive brown, moist, stiff (26.5 - 30.5) Med. yellowish brown streaked w/ dark yellowish brown and Lt. olive gray silt
5	262						
10	257	2	35	78			
15	252						
20	247	3	80				
25	242						
30	237	4	80			CL	(30.5 - 35) Lt. gray to Lt. olive gray sandy clay, moist to wet, med. stiff to stiff (35 - 38) Lt. olive gray clay w/ dark yellowish orange sandy clay, very stiff to hard
35	232						
40	227	5	90	0.6		SM	(38 - 42.5) Dark yellowish orange and grayish orange fine sand, micaceous, (6" section of gravel between 40.5 and 41)
45	222					SW	(42.5 - 47) Grayish orange coarse sand w/ scattered gravel (up to 1" dia.)
50	217	6	100	0.2		SP	(47 - 51) Dark yellowish orange and grayish orange fine sand
55	212					SW	(51 - 55) Dark yellowish orange and grayish orange fine to med. gravelly sand (up to 3/4" dia.) (55 - 65) Grayish orange med. to corase gravelly sand (up to 1" dia.)
60	207	7	90	0.4			
65	202					GM	(65 - 65.5) Dark yellowish orange silty sandy gravel, wet
70	197	8	100			CL	(65.5 - 74.5) Dusky yellowish brown clay, stiff, hard (74.5 - 75) Lt. olive gray fine sand lenses within clay matrix
75	192						
80							



SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

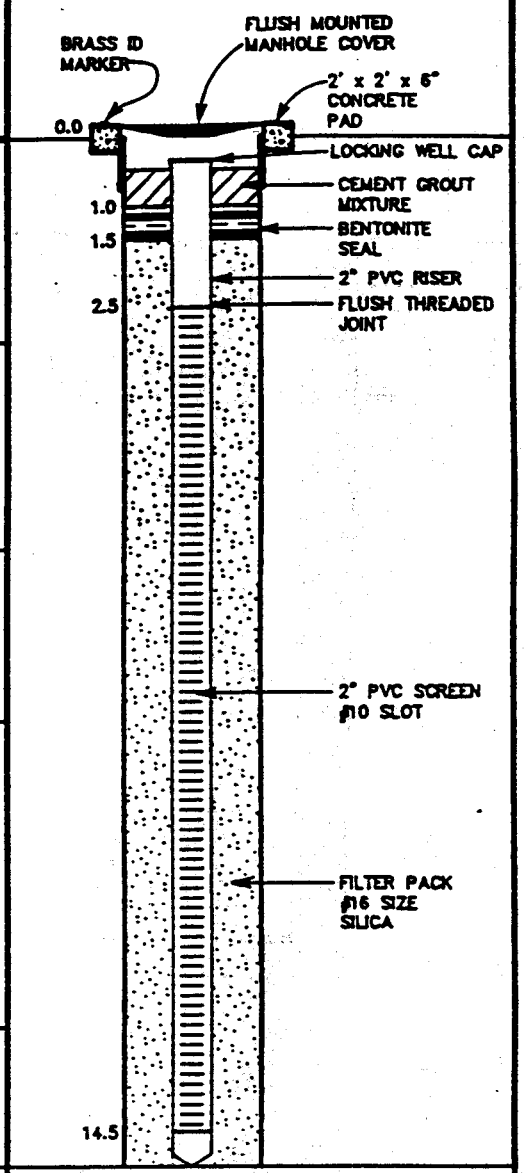
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEMS 1489, 1490, 1491, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1489-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, LIGHT BROWN, WITH PEA GRAVEL MOIST
			3.0
			SILT, CLAYEY, LIGHT BROWN
5			
			6.0
			SILT, CLAYEY, GREEN, WET
			8.5
10			SILT, CLAYEY, LIGHT BROWN, WET MODERATE HYDROCARBON ODOR
			13.0
			13.1 24 HOUR WATER LEVEL
			SILT, CLAYEY, GRAY, WET MODERATE HYDROCARBON ODOR
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: DEC. 28, 1989

Well Completion Date: DEC. 28, 1989

Well Development Date: N.A.

Drilling Method: POWER AUGER

Depth to Water: 13.1'

Boring Diameter: 6.75"

Ground Elevation: 268.13'

Top of Casing Elevation:

Driller: B. ELDER

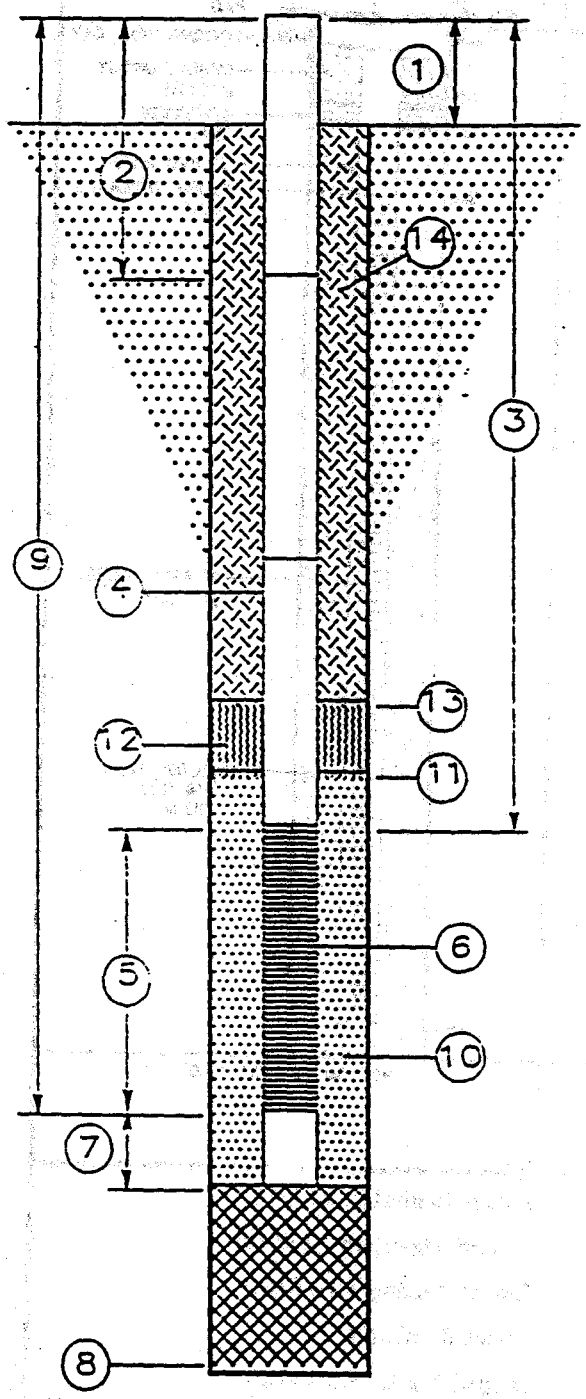
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1489-1

DATE OF INSTALLATION 12-28-89



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

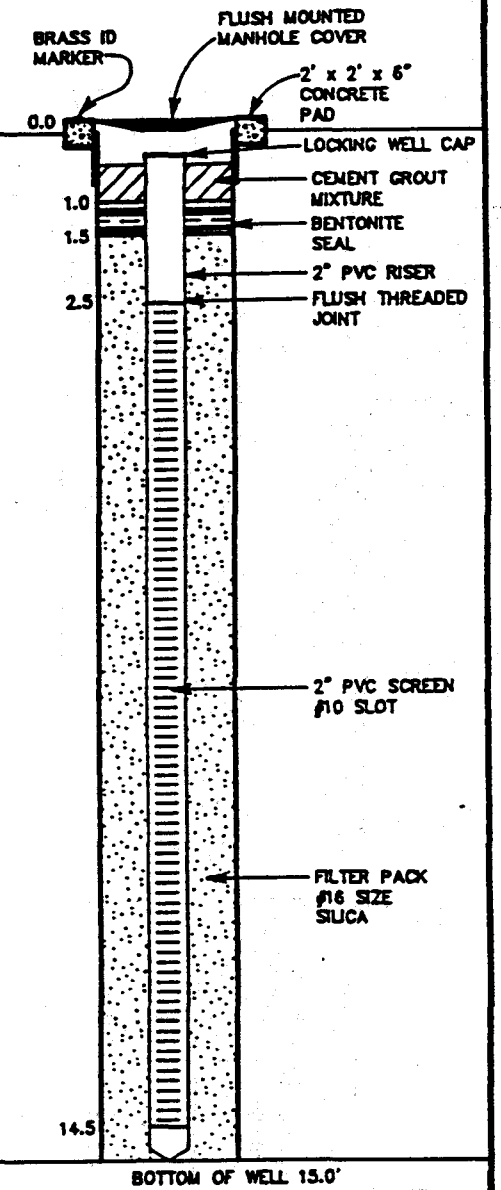
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEMS 1489, 1490, 1491, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1489-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILTY, BROWN, MOIST (0.0 – 3.0)
			SILT, CLAYEY, GRAY SLIGHT HYDROCARBON ODOR (3.0 – 6.0)
5			SILT, CLAYEY, GREEN, WET MODERATE HYDROCARBON ODOR (6.0 – 10.0)
10			SILT, CLAYEY, LIGHT BROWN, WET MODERATE HYDROCARBON ODOR (10.0 – 13.0)
			12.2 24 HOUR WATER LEVEL
			SILT, CLAYEY, GRAY, WET MODERATE HYDROCARBON ODOR (13.0 – 15.0)
15			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: DEC. 28, 1989 — Boring Diameter: 6.75"

Well Completion Date: DEC. 28, 1989 — Ground Elevation: 268.22'

Well Development Date: N.A. — Top of Casing Elevation:

Drilling Method: POWER AUGER — Driller: B. ELDER

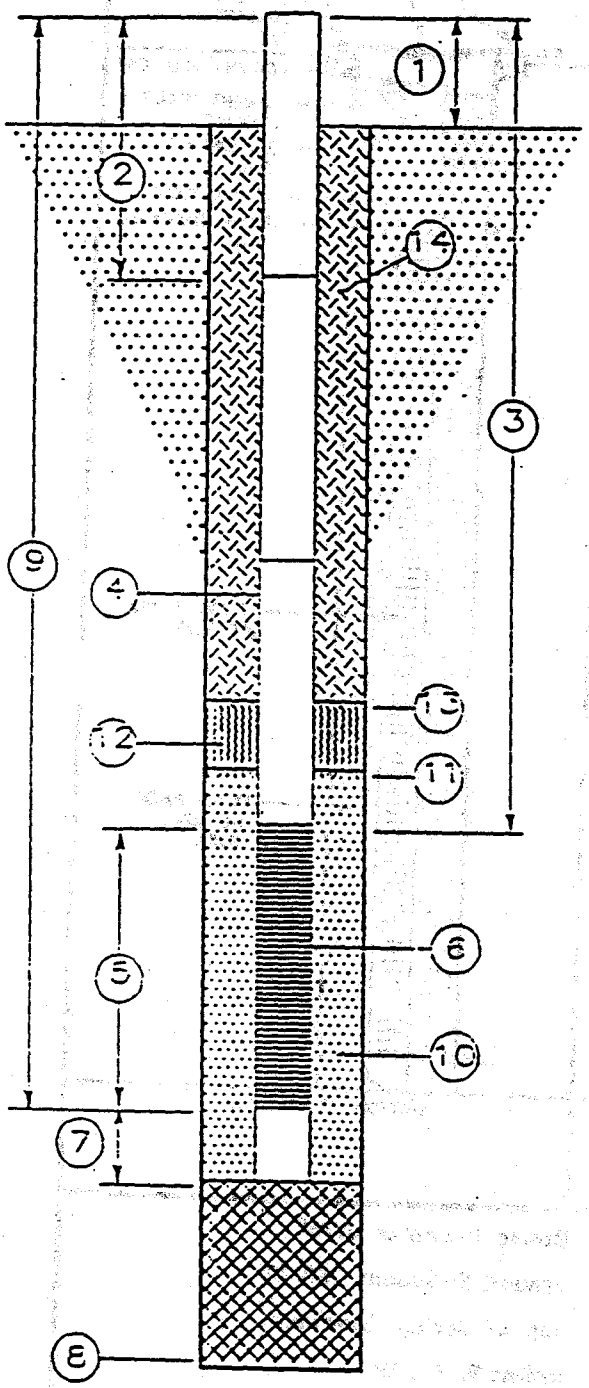
Depth to Water: 12.2' — Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-1489-2

DATE OF INSTALLATION 12/28/89



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 $ft.^3$ Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 $ft.^3$
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

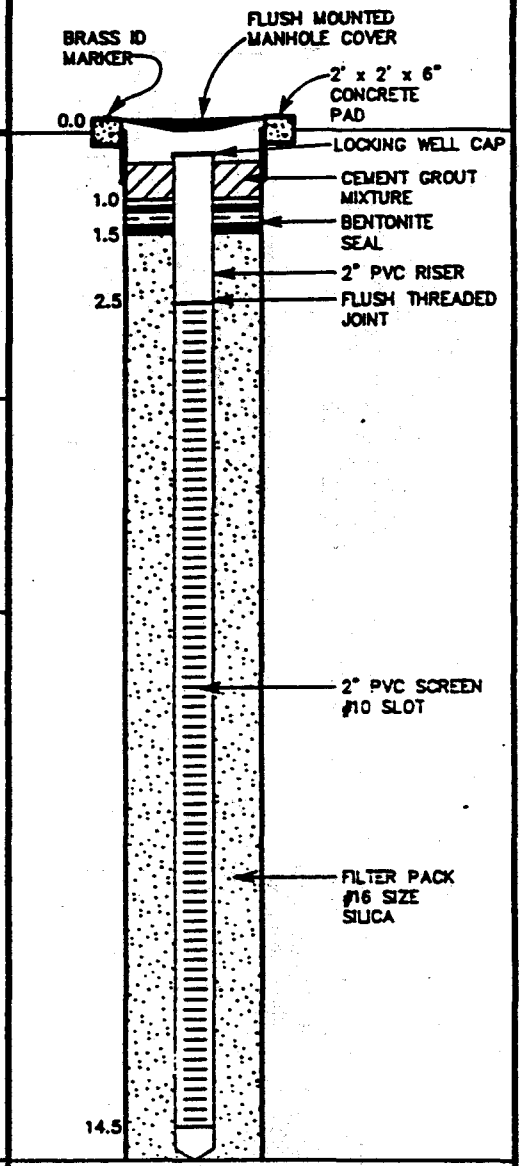
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEMS 1489, 1490, 1491, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T1489-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, LIGHT BROWN
			4.0
5			CLAY, SILTY, GRAY
			7.0
10			CLAY, SILTY, GRAY, MOIST SLIGHT HYDROCARBON ODOR
			13.8 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: DEC. 28, 1989
Well Completion Date: DEC. 28, 1989
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 13.8'

Boring Diameter: 6.75"
Ground Elevation: 267.51'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

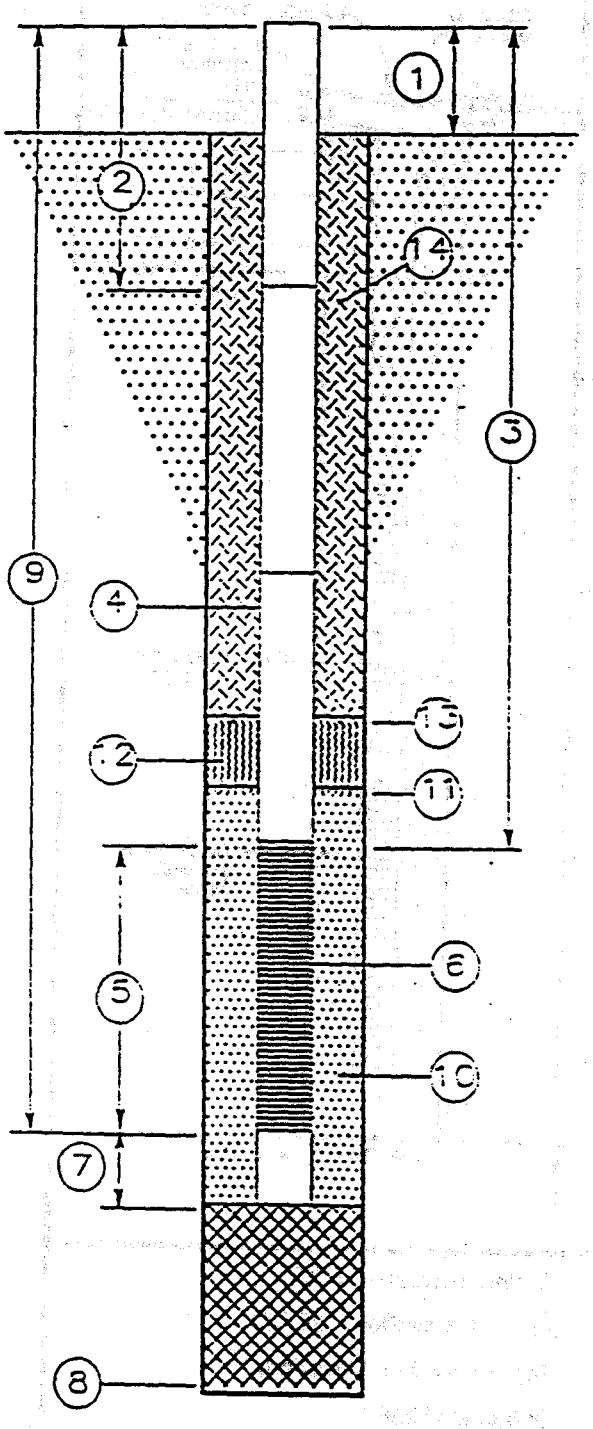
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T-1489-3

DATE OF INSTALLATION 12-28-89



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

Well Construction Details

Appendix III

Release Detection Manual
NAS Memphis, Tn
April, 1991

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

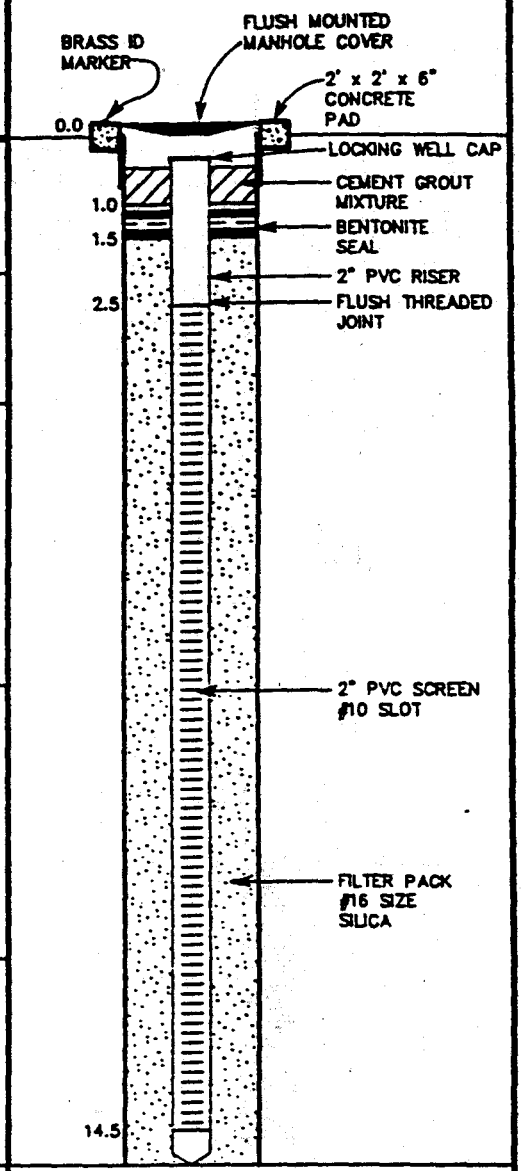
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEMS 1489, 1490, 1491, NAS, MEMPHIS, TN.

LOG OF BORING NO. A4 LOG OF WELL NO. MEM-T1489-4

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, LIGHT BROWN, MOIST
			2.0
			SILT, CLAYEY, GRAY SLIGHT HYDROCARBON ODOR
			4.0
5			SILT, CLAYEY, GREEN, MOIST SLIGHT HYDROCARBON ODOR
			7.0
10			SILT, CLAYEY, LIGHT BROWN, MOIST MODERATE HYDROCARBON ODOR
			12.0
			13.1 24 HOUR WATER LEVEL SILT, CLAYEY, GRAY
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



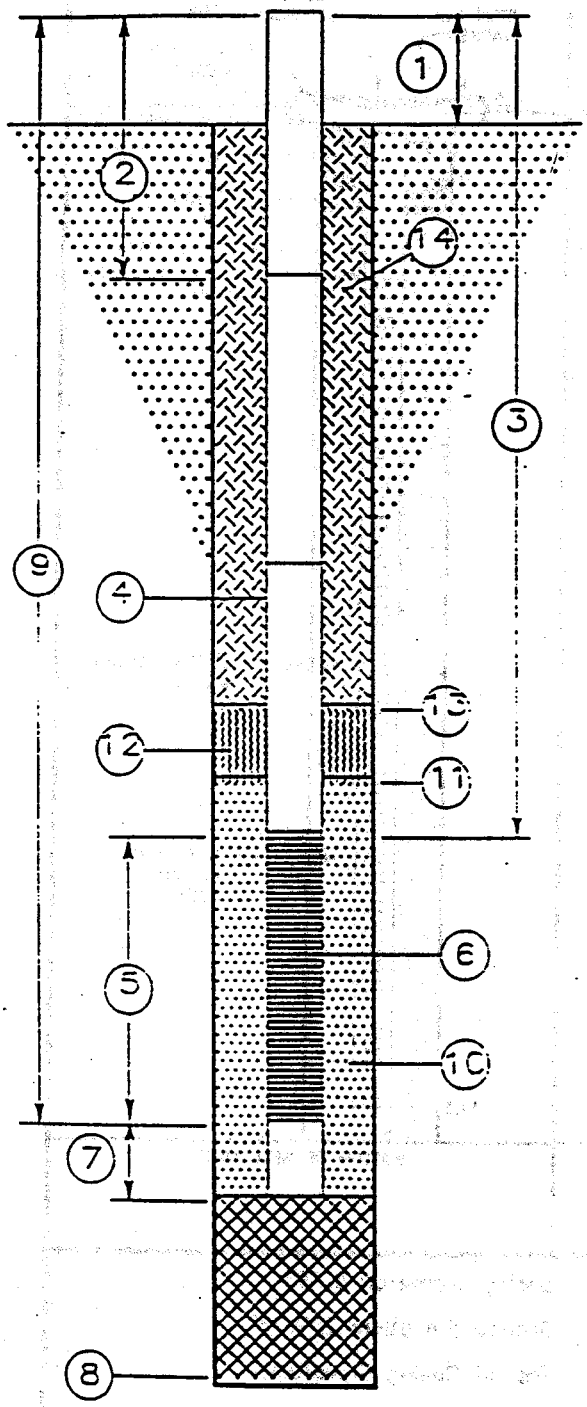
Boring Completion Date: NOV. 18, 1990
Well Completion Date: NOV. 28, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 13.1'

Boring Diameter: 6.75"
Ground Elevation: 267.75'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL NUMBER MEM-T1489-4

DATE OF INSTALLATION 12-28-89



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #25 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

Well Construction Details

Appendix III

Release Detection Manual
NAS Memphis, Tn
April, 1991

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

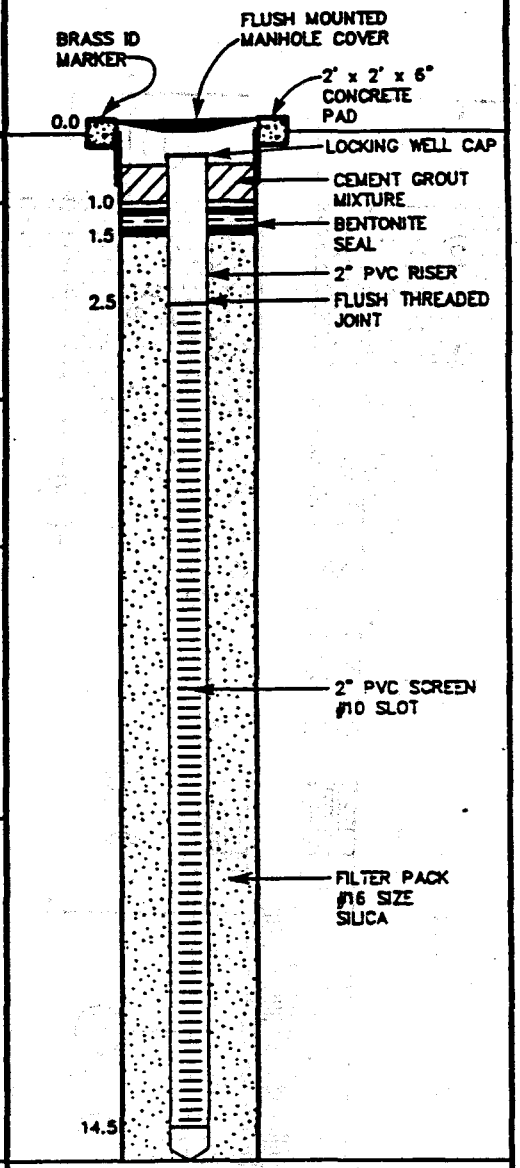
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1508, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1508-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			GRAVEL 1.0
			SILT, LIGHT BROWN, MOIST SLIGHT HYDROCARBON ODOR 4.0
5			SILT, CLAYEY, GREEN, MOIST SLIGHT HYDROCARBON ODOR 6.0
			SILT, CLAYEY, GRAY MODERATE HYDROCARBON ODOR 10.0
10			SILTY, CLAYEY, LIGHT BROWN SLIGHT HYDROCARBON ODOR 13.0 24 HOUR WATER LEVEL 15.0
15			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: DEC. 29, 1990
Well Completion Date: DEC. 29, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 13.0'

Boring Diameter: 6.75"
Ground Elevation: 268.07'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

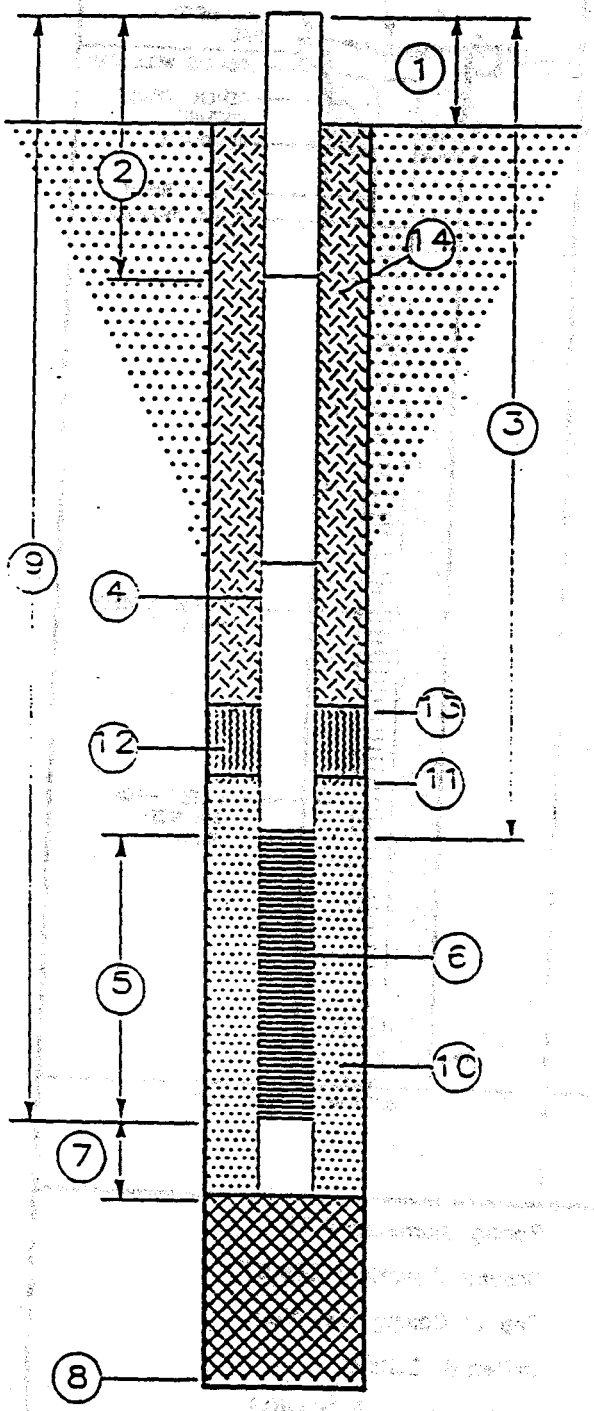
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1508-1

DATE OF INSTALLATION 12-29-89



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

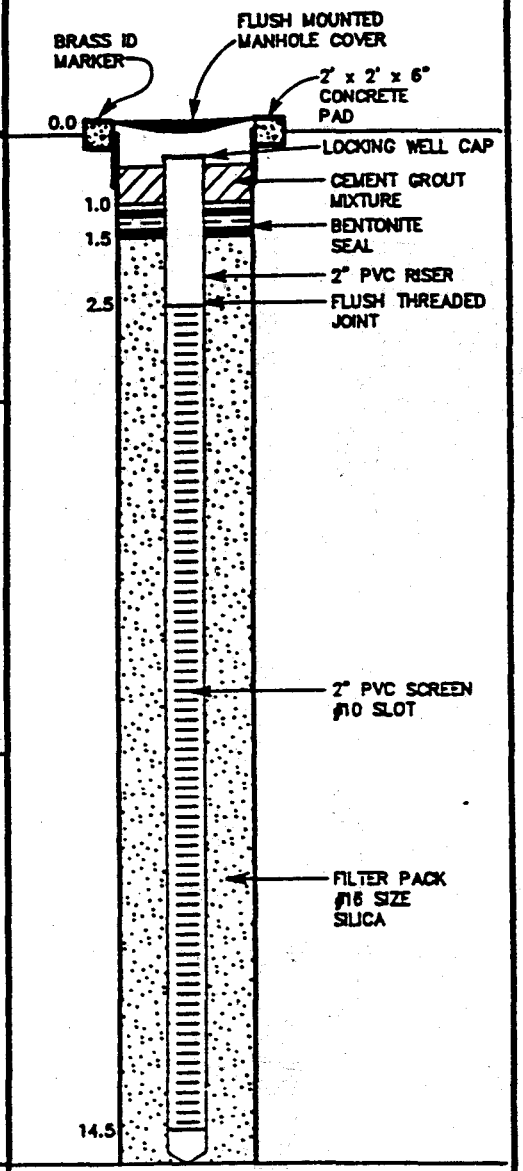
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1508, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1508-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, LIGHT BROWN, WITH GRAVEL MOIST, SLIGHT HYDROCARBON ODOR
			4.0
5			SILT, CLAYEY, LIGHT GRAY SLIGHT HYDROCARBON ODOR
			9.0
10			SILT, CLAYEY, LIGHT BROWN, WET SLIGHT HYDROCARBON ODOR
			12.9 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



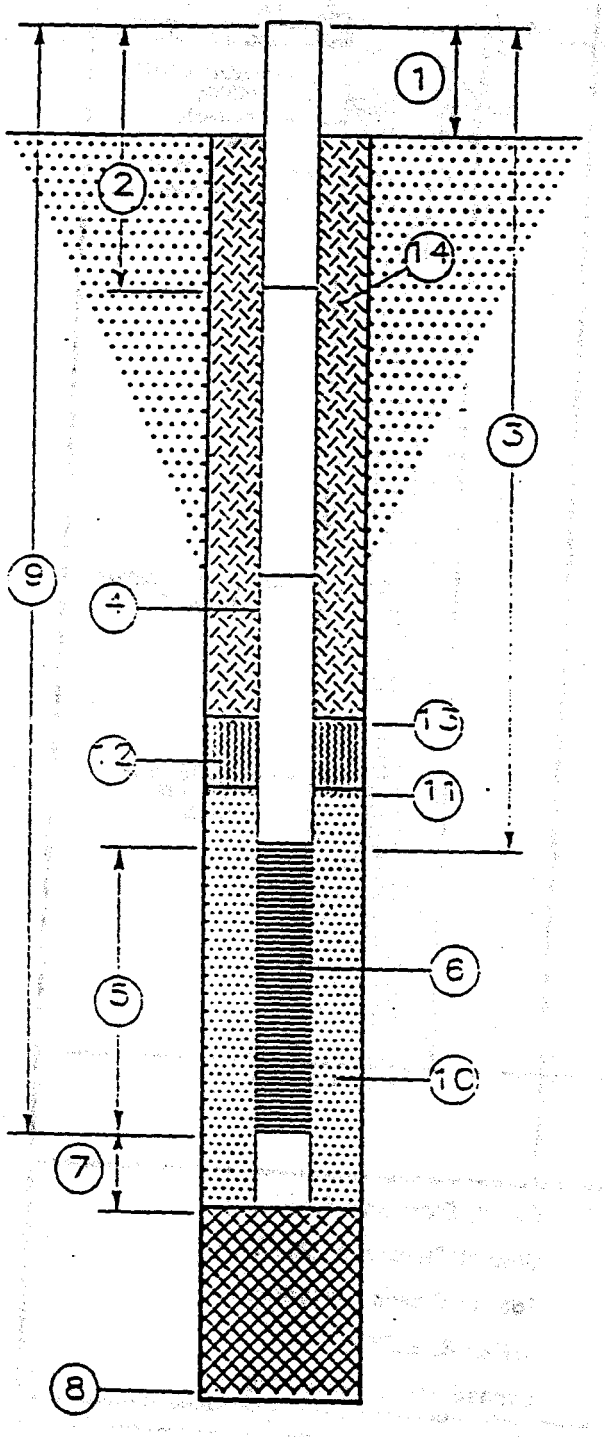
Boring Completion Date: DEC. 29, 1990
Boring Diameter: 6.75"
Well Completion Date: DEC. 29, 1990
Ground Elevation: 267.74'
Well Development Date: N.A.
Top of Casing Elevation:
Drilling Method: POWER AUGER
Driller: B. ELDER
Depth to Water: 12.9'
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1508-2

DATE OF INSTALLATION 12/29/89



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

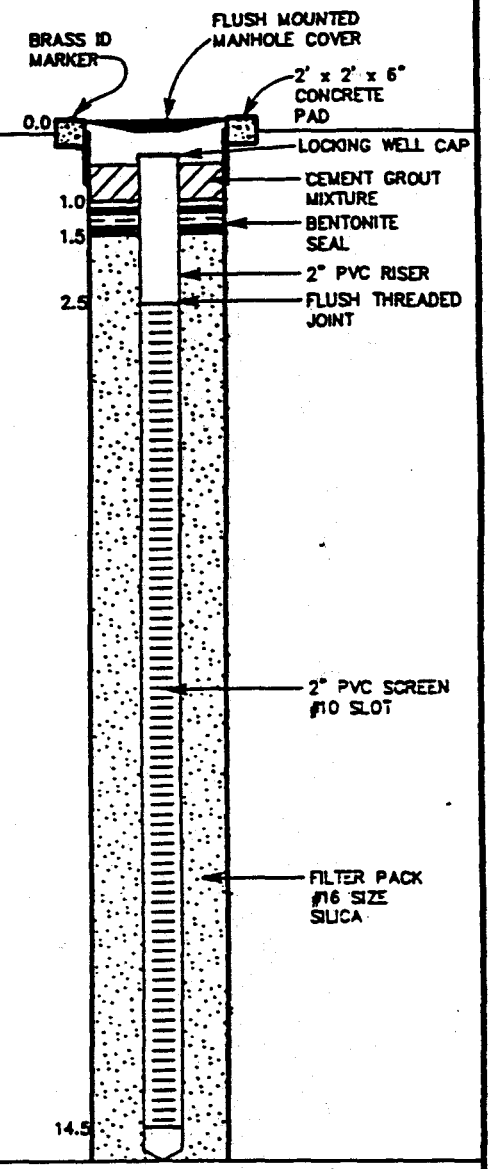
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1508, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T1508-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, LIGHT BROWN WITH GRAVEL MOIST, SLIGHT HYDROCARBON ODOR
			4.0
5			SILT, CLAYEY, LIGHT GRAY WITH TRACES OF GRAVEL, SLIGHT HYDROCARBON ODOR
			9.0
10			SILT, CLAYEY, LIGHT BROWN, MOIST SLIGHT HYDROCARBON ODOR
			12.5 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: DEC. 29, 1990 Boring Diameter: 6.75"

Well Completion Date: DEC. 29, 1990 Ground Elevation: 266.67'

Well Development Date: N.A. Top of Casing Elevation:

Drilling Method: POWER AUGER Driller: B. ELDER

Depth to Water: 12.5' Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

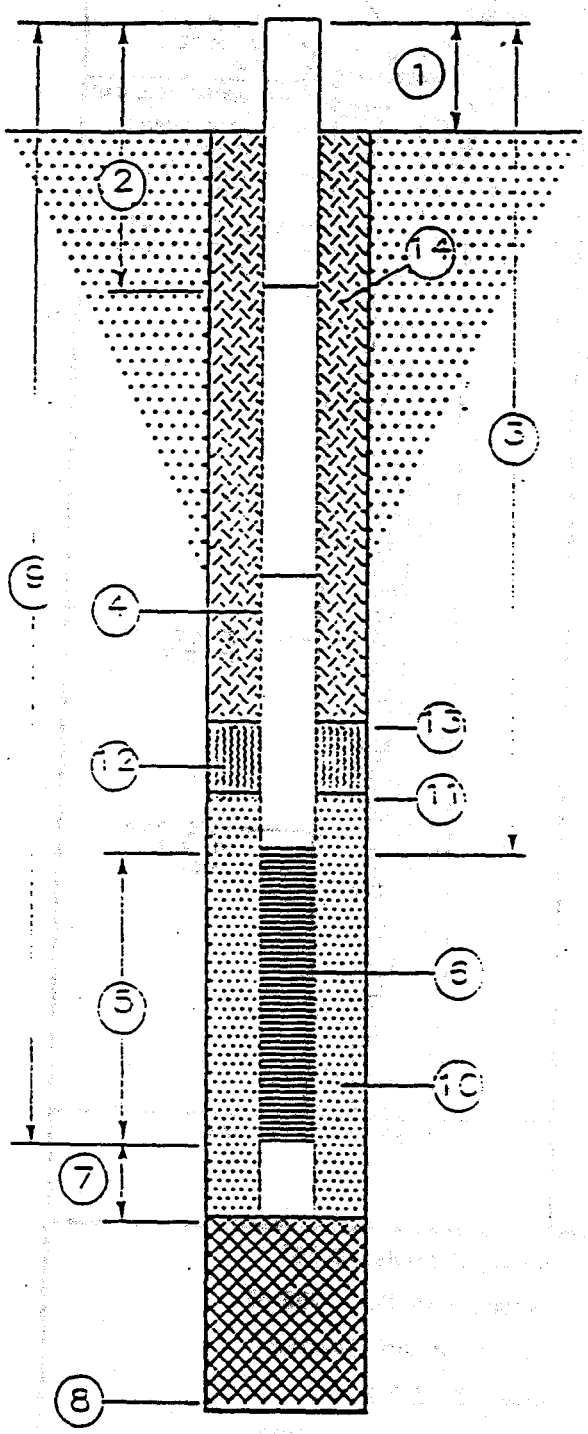
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1508-3

DATE OF INSTALLATION 12-29-89



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC [illegible] slot
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #[illegible] U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SWMU 7

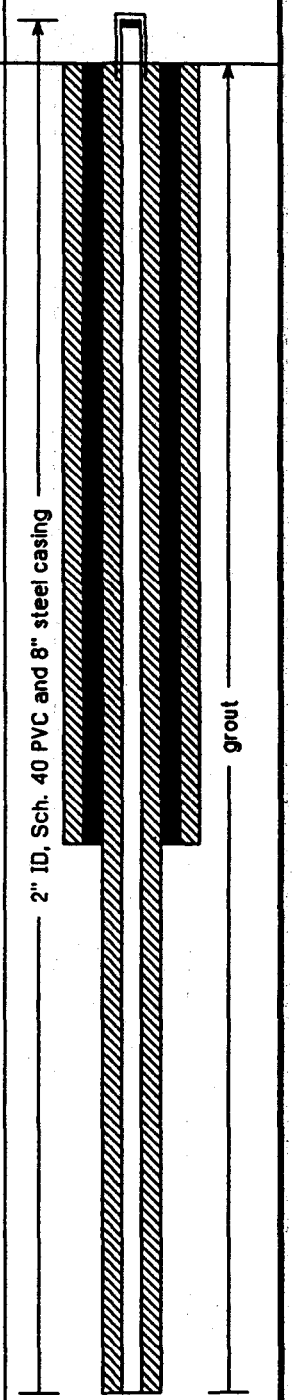
EnSafe/Allen & Hoshall

Monitoring Well 07MW01LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.50 feet msl*
Started at *1015 on 2-07-95*	TOC Elevation: *284.90 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *27.03 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.87 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *70 feet*
Geologist: *Ben Brantley*	Well Screen: *59 to 69 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, grayish blue green, moist.	
5			1	80	BG				
								Clayey silt, moderate brown, medium stiff.	
10									
							ML	Clayey silt, moderate brown to dark yelllowish brown, mottled pale yellowish brown.	
15			2	100	BG				
								Clayey silt, light brown to reddish brown, stiff, dry.	
20								Clayey silt, moderate brown, stiff.	
25			3	100	BG				258.5
								Clayey sand, fine to medium, dark yellowish brown to light brown.	
30									
							SC		
35			4	95	BG				
40									

WELL DIAGRAM



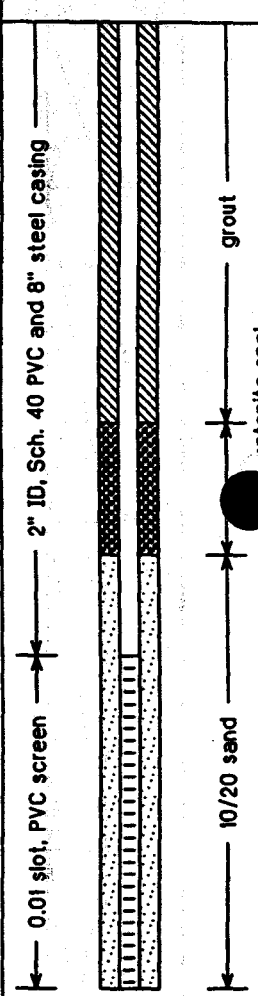
EnSafe/Allen & Hoshall

Monitoring Well 07MW01LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.50 feet msl*
Started at *1015 on 2-07-95*	TOC Elevation: *284.90 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *27.03 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.87 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *70 feet*
Geologist: *Ben Brantley*	Well Screen: *59 to 69 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45							SC		
50									231.5
55			5	90	BG		GP	Gravelly sand, coarse, grayish orange to yellowish orange.	
60									
65									
70									214.5
75			6	87	BG			Log information taken from the boring for the Cockfield well at SWMU#7 site 1.	
80									

WELL DIAGRAM



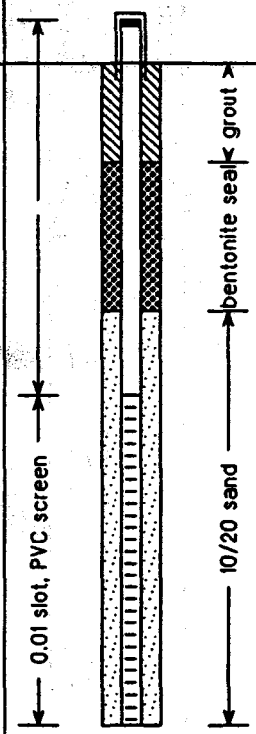
EnSafe/Allen & Hoshall

Monitoring Well 07MW01LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.15 feet msl*
Started at *1015 on 2-07-95*	TOC Elevation: *284.74 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *21.10 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *263.64 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ben Brantley*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, grayish blue green, moist.	
5			1	80	BG				
								Clayey silt, moderate brown, medium stiff.	
10									
							ML	Clayey silt, moderate brown to dark yellowish brown, mottled pale yellowish brown.	
15			2	100	BG				
								Clayey silt, light brown to reddish brown, stiff, dry.	
20			3	100	BG			Clayey silt, moderate brown, stiff.	
25									258.1
								Log information taken from the boring for the Cockfield well at SWMU#7 site 1.	
30									
35									
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

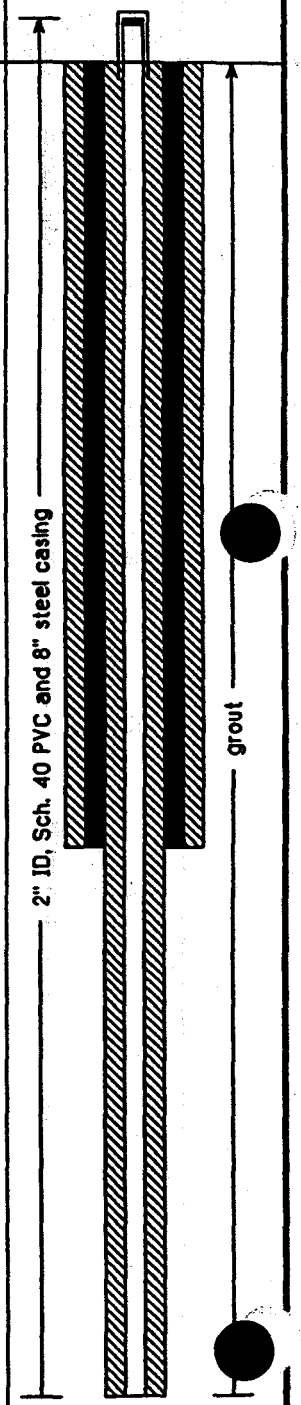
Monitoring Well 07MW01C

(007G01UC)

Project: *NAS Memphis*	Location: *Millington, TN. Building N-126*
Project No.: *N0094*	Surface Elevation: *282.75 feet msl*
Started at *1015 on 2-07-95*	TOC Elevation: *284.64 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *29.48 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.16 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *110.0 feet*
Geologist: *Ben Brantley*	Well Screen: *97 to 107 feet*

DEPTH IN FEET	SAMPLE NO.	% RECOVERY	PID (ppm)	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	1		146		Clayey silt, grayish blue green, moist.	
	2		89.4			
5	3	80	55			
	4		9.1		Clayey silt, moderate brown, medium stiff.	
10	5		6.3			
	6		2.9	ML	Clayey silt, moderate brown to dark yellowish brown, mottled pale yellowish brown.	
	8		24.8			
15	9	100	12.3		Clayey silt, light brown to reddish brown, stiff, dry.	
	10		0.3			
20	11		BG		Clayey silt, moderate brown, stiff.	
	12		BG			
25	13	100	BG			257.7
	14		BG		Clayey sand, fine to medium, dark yellowish brown to light brown.	
	15		BG			
30	16		BG	SC		
	17		BG			
35	18	95	BG			
	19		BG			248.7
	20		BG	GP		
40						

WELL DIAGRAM



EnSafe/Allen & Hoshall

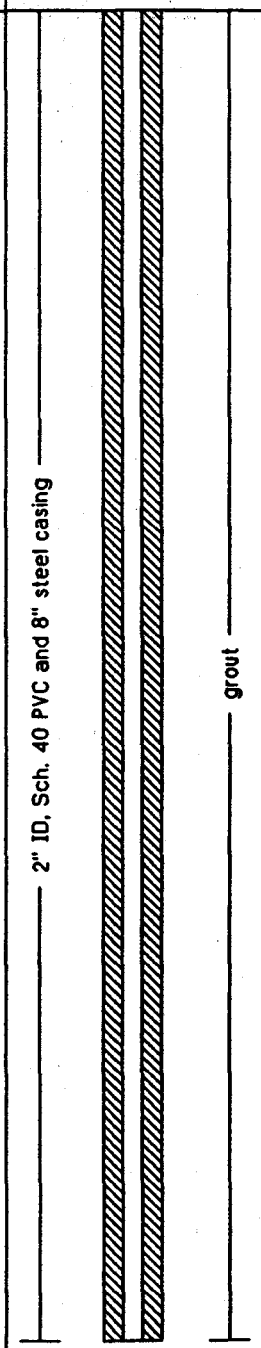
Monitoring Well 07MW01C

(007G01UC)

Project: *NAS Memphis*	Location: *Millington, TN. Building N-126*
Project No.: *N0094*	Surface Elevation: *282.75 feet msl*
Started at *1015 on 2-07-95*	TOC Elevation: *284.64 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *29.48 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.16 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *110.0 feet*
Geologist: *Ben Brantley*	Well Screen: *97 to 107 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			21		BG				
			22		BG				
45			23		BG		GP		
			24		BG				
			25		BG				
50			26		BG				
			27		BG			Gravelly sand, coarse, grayish orange to yellowish orange.	230.7
55			28	90	BG				
			29		0.8				
			30						
60			31		1.0				
			32		0.8				
65			33		0.8		SC		
			34		0.8				
			35		BG			Sand clayey, fine, pale yellowish orange to moderate orange.	
70			36		BG			Silty clayey sand, fine, medium gray to olive gray, contains marcasite nodules.	
			37		BG				
75			38	87	BG			Sand, fine, yellowish gray to light gray, lignite at 79.5'.	
			39		BG				
80			40		BG				

WELL DIAGRAM



EnSafe/Allen & Hoshall

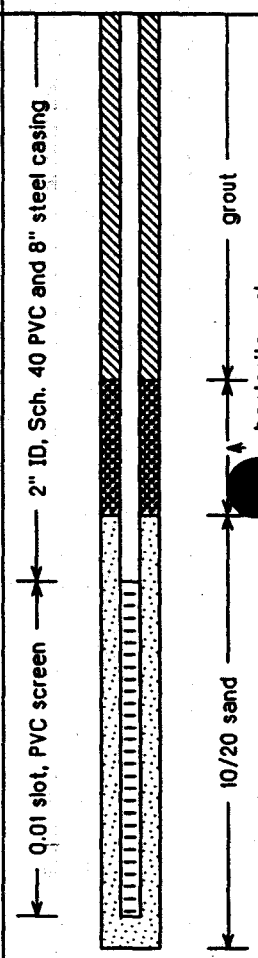
Monitoring Well 07MW01C

(007G01UC)

Project: *NAS Memphis*	Location: *Millington, TN. Building N-126*
Project No.: *N0094*	Surface Elevation: *282.75 feet msl*
Started at *1015 on 2-07-95*	TOC Elevation: *284.64 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *29.48 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.16 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *110.0 feet*
Geologist: *Ben Brantley*	Well Screen: *97 to 107 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			41		BG			Sand, fine, medium gray to olive gray, micaceous.	
			42		BG				
85			43		BG			Sand, fine, light olive gray to gray with dusky brown clay lenses.	
			44		BG				
			45		BG				
90			46		BG				
			47		BG		SC		
95			48	110	BG				
			49		BG				
			50		BG			Same as above but increasing amounts of clay from 99' to 105'.	
100			51		BG				
			53		BG				
105			54		BG				177.7
			55		BG		CL	Clay, waxy, dusky brown, hard, has olive gray sand lenses.	
			56		BG				
110			57	100					172.7
								End of boring at 110'.	
115									
120									

WELL DIAGRAM



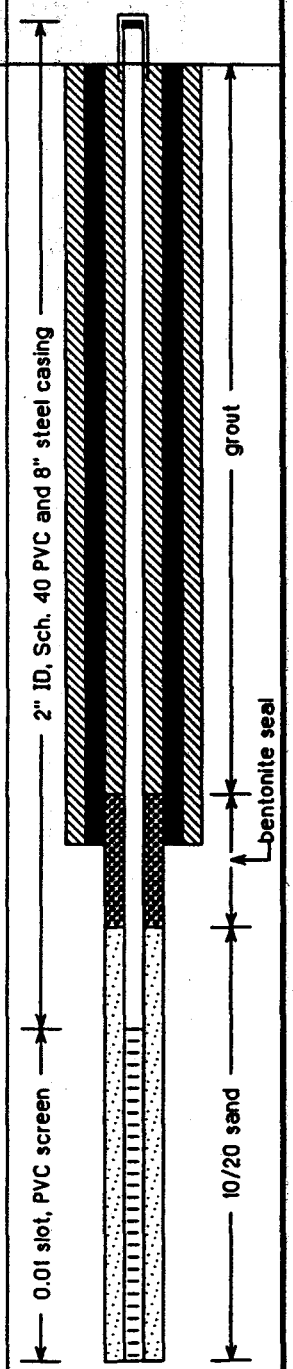
EnSafe/Allen & Hoshall

Monitoring Well 07MW01UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.60 feet msl*
Started at *1015 on 2-07-95*	TOC Elevation: *284.99 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *27.93 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.06 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *40.0 feet*
Geologist: *Ben Brantley*	Well Screen: *29 to 39 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, grayish blue green, moist.	
5			1	80	BG				
								Clayey silt, moderate brown, medium stiff.	
10									
							ML	Clayey silt, moderate brown to dark yellowish brown, mottled pale yellowish brown.	
15			2	100	BG				
								Clayey silt, light brown to reddish brown, stiff, dry.	
20								Clayey silt, moderate brown, stiff.	
25			3	100	BG				258.6
								Clayey sand, fine to medium, dark yellowish brown to light brown.	
30							SC		
35			4	95	BG				
40									243.6

WELL DIAGRAM



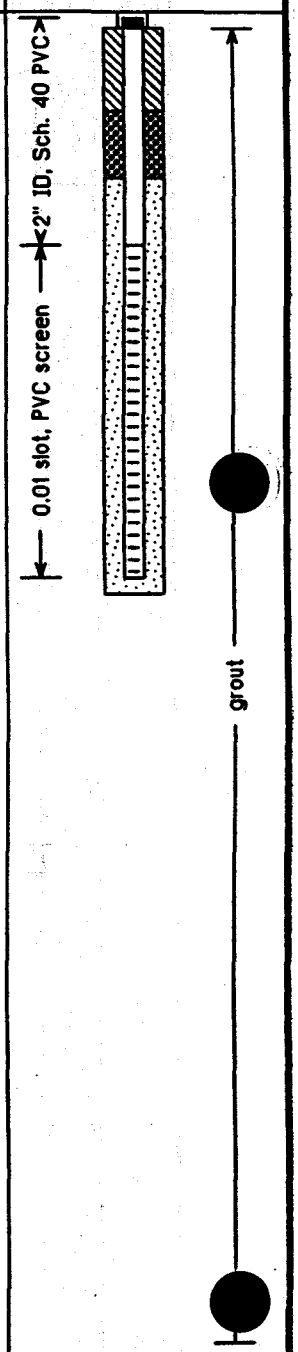
EnSafe/Allen & Hoshall

Monitoring Well 07MW02LS
Boring 07MW02LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *on 2-07-95*	TOC Elevation: *feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ben Brantley*	Well Screen: *to feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, grayish green with dark yellow brown.	
5			1	90	BG				
10							ML	Clayey silt, dark yellowish brown to light olive gray.	
15			2	100	BG			Clayey silt, dark yellowish orange to light brown, medium stiff, dry.	
20			3	100	BG			End of boring at 20'. Mointoring well closed in place on 3/07/95 due to the absence of groundwater. Well was closed by drilling out the well and grouting up the remaining borehole.	
25									
30									
35									
40									

WELL DIAGRAM



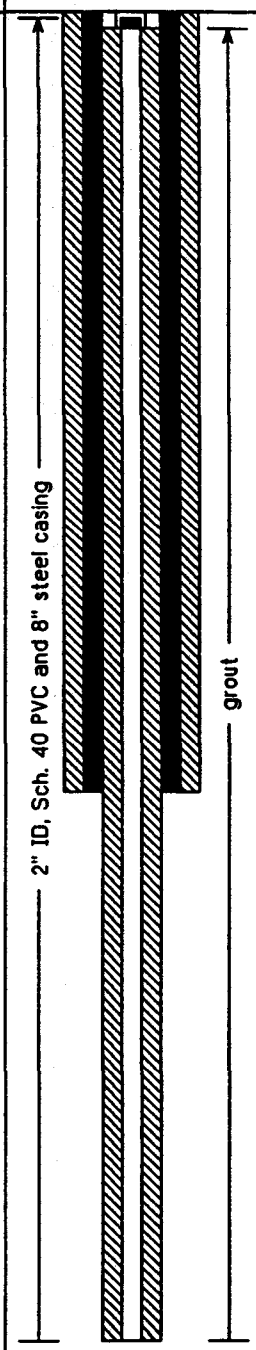
EnSafe/Allen & Hoshall

Monitoring Well 07MW02UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.61 feet msl*
Started at *1150 on 2-07-95*	TOC Elevation: *283.18 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *26.99 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.19 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125.0 feet*
Geologist: *Ben Brantley*	Well Screen: *106 to 116 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1		BG			Clayey silt, grayish green with dark yellow brown.	
			2		BG				
5				90					
			3		BG				
			4		41.9				
10			5		20.0				
			6		BG		ML	Clayey silt, dark yellowish brown to light olive gray.	
15			7	100	BG				
			8		BG			Clayey silt, dark yelllowish orange to light brown, medium stiff, dry.	
			9		BG				
20			10	100	BG			Clayey silt, moderate brown with organics.	
			11		BG				
			12		33.4				
25				100					258.6
			13		BG			Sandy clay, moderate reddish to light brown, medium stiff, fine.	
			14		BG				
30			15		BG		GM		
			16		BG			Silty clayey sand, medium, brown to yellowish orange, a few small gravels.	
35			17	80	BG				
			18		BG				
			19		BG		GP	Sand, medium, yellowish gray to grayish orange, micaceous.	245.6
40									

WELL DIAGRAM

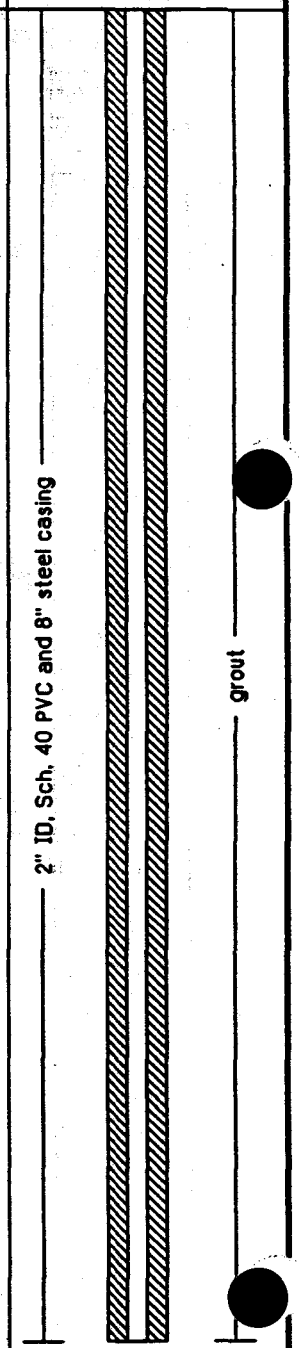


EnSafe/Allen & Hoshall

Monitoring Well 07MW02UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.61 feet msl*
Started at *1150 on 2-07-95*	TOC Elevation: *283.18 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *26.99 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.19 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125.0 feet*
Geologist: *Ben Brantley*	Well Screen: *106 to 116 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
			20		BG					
			21		BG					
45			22		BG					
			23		BG					
			24		BG			Sand, coarse, gravelly, grayish orange to dark yellowish orange, gravels up to 2" in diameter.		
50			25		BG					
			26		BG					
55			27	87	BG					
			28		BG					
			29		BG					
60			30		BG		GP			
			31		BG					
65			32		BG					
			33		BG					
			34		BG					
70			35		BG					
			36		BG					
75			37	90	BG			Sand, fine, light gray to pale yellowish orange, with light gray clay lenses.		
80										



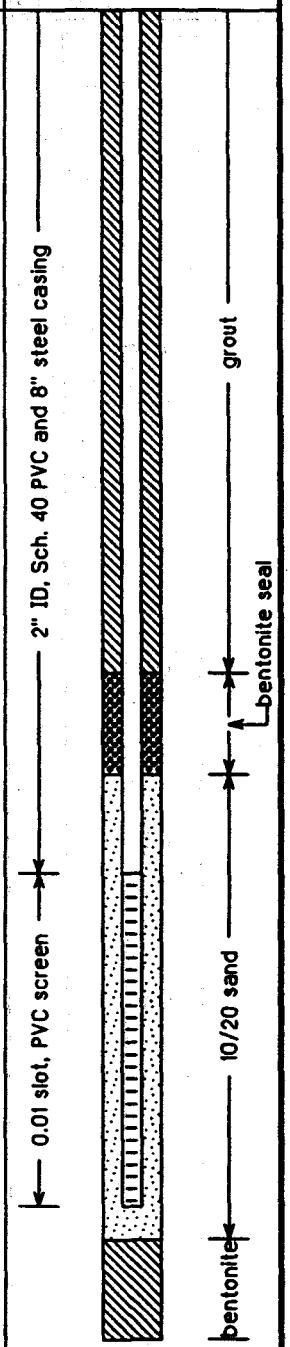
EnSafe/Allen & Hoshall

Monitoring Well 07MW02UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.61 feet msl*
Started at *1150 on 2-07-95*	TOC Elevation: *283.18 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *26.99 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.19 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125.0 feet*
Geologist: *Ben Brantley*	Well Screen: *106 to 116 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							GP		
								Silty sand, fine, light olive gray to grayish brown, conatains dusky brown clay lenses.	201.6
85									
90									
95			47	90	BG			Lignite laminations from 94'-95'.	
							SM	Marcasite present at 98'.	
100									
105									
110									
115			9	95	BG				
							OL	Clay, dusky brown, hard, waxy, with thin sand laminations.	167.6
120									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 07MW02UC
Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.61 feet msl*
Started at *1150 on 2-07-95*	TOC Elevation: *283.18 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *26.99 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.19 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125.0 feet*
Geologist: *Ben Brantley*	Well Screen: *106 to 116 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							OL			bentonite
125			10	90	BG			End of boring at 125'.	158.6	
130										
135										
140										
145										
150										
155										
160										

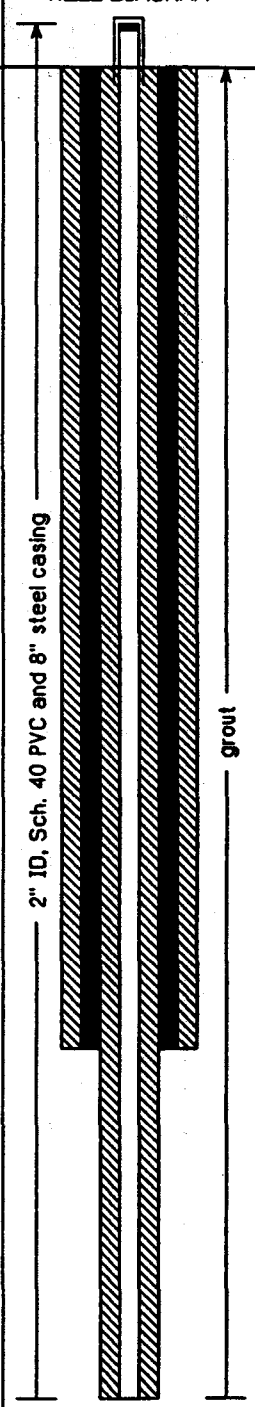
EnSafe/Allen & Hoshall

Monitoring Well 07MW03LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.82 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.32 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *25.23 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *80.0 feet*
Geologist: *Ben Brantley*	Well Screen: *69.5 to 79.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown to moderate yellowish brown, moist.	
5			1	40	BG				
10			2	120	BG				
15			3	100	BG		ML	Clayey silt, olive black, moist, soft.	
20			4	90	BG			Clayey silt, dark yellowish brown, medium stiff.	
25			5	90	BG			Clayey silt, moderate brown with yellow gray silt, organics.	
30			6	100	BG			Clayey silt with sand, moderate brown.	253.8
								Silty clayey sand, yellowish orange to yellowish brown.	
35			7	100	BG		SC	Silty sand, yellowish orange to reddish brown, fine to medium grained.	
40			8	120	BG				

WELL DIAGRAM



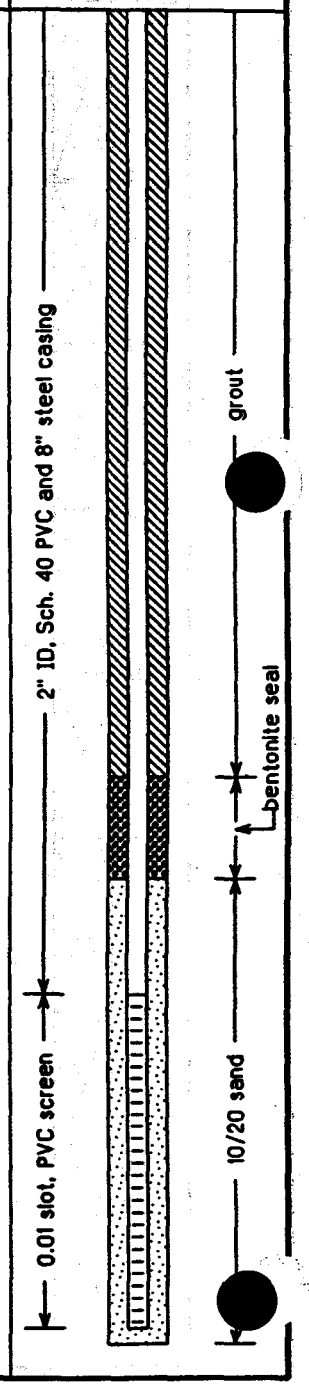
EnSafe/Allen & Hoshall

Monitoring Well 07MW03LF

Project: *NAS Memphis*	Location: *Millington, TN SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.82 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.32 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *25.23 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *80.0 feet*
Geologist: *Ben Brantley*	Well Screen: *69.5 to 79.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SC		242.8
								Sand, yellowish gray, fine.	
								Sand, medium, yellowish orange to yellowish brown.	
45			9	120	BG			Sand, medium to coarse, grayish orange to yellow gray, with gravels.	
50									
55			10	75	BG				
60							GP		
65			11	80	BG				
70									
75			12	80	BG				
							SC	Silty sand, fine, yellowish orange to yellow gray.	205.8
80									203.8

WELL DIAGRAM



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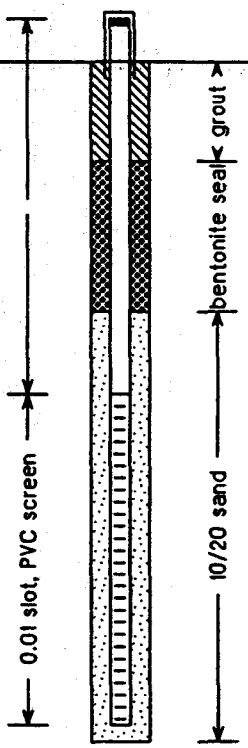
Monitoring Well 07MW03LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.81 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.47 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *13.10 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *270.37 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ben Brantley*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown to moderate yellowish brown, moist.	
5			1	40	BG				
10			2	120	BG		ML		
15			3	100	BG			Clayey silt, olive black, moist, soft.	
20			4	90	BG				263.8
								Log information taken from the boring for the Cockfield well at SWMU#7 Site 3.	
25									
30									
35									
40									

WELL DIAGRAM



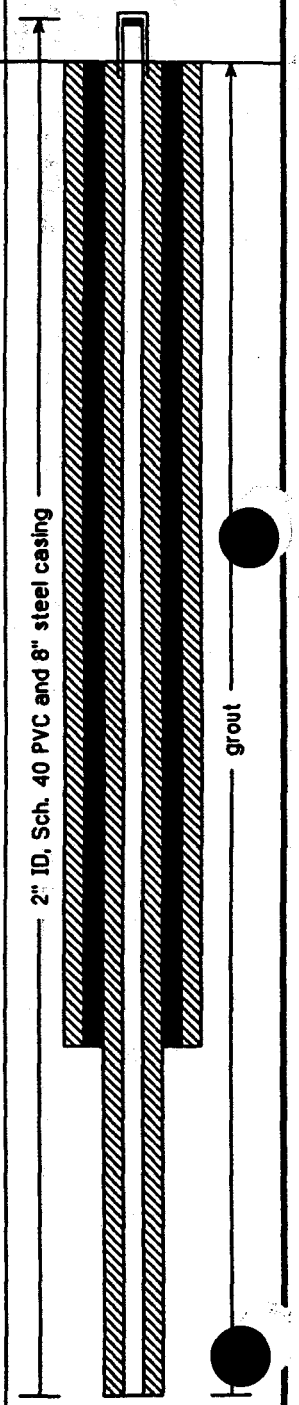
EnSafe/Allen & Hoshall

Monitoring Well 07MW03UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.83 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.47 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *26.48 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.99 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *115.0 feet*
Geologist: *Ben Brantley*	Well Screen: *97 to 107 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1		BG			Clayey silt, moderate brown to moderate yellowish brown, moist.	
			2		BG				
5				40					
			3		BG				
			4		BG				
10			5	120	BG				
			6		BG				
			7		BG				
15				100			ML	Clayey silt, olive black, moist, soft.	
			9		BG				
			10		BG				
20			11	90	BG			Clayey silt, dark yellowish brown, medium stiff.	
			12		BG				
			13		BG				
25				90				Clayey silt, moderate brown with yellow gray silt, organics.	
			14		BG				
			15		BG				
30			16	100	BG				253.8
								Clayey silt with sand, moderate brown.	
			17		BG			Silty clayey sand, yellowish orange to yellowish brown.	
			18		BG				
35				100			SC	Silty sand, yellowish orange to reddish brown, fine to medium grained.	
			19		BG				
			20		BG				
40			21	120	BG				

WELL DIAGRAM



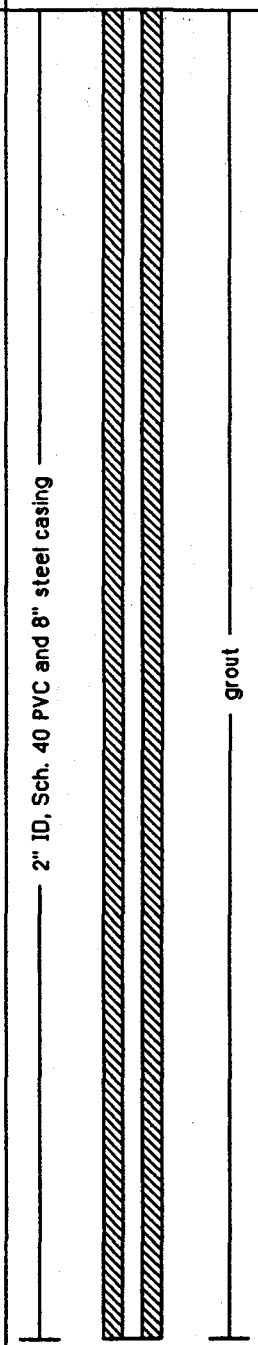
EnSafe/Allen & Hoshall

Monitoring Well 07MW03UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.83 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.47 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *26.48 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.99 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *115.0 feet*
Geologist: *Ben Brantley*	Well Screen: *97 to 107 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			22		0.2		SC		242.8
			23		0.2			Sand, yellowish gray, fine.	
45			24	120	BG			Sand, medium, yellowish orange to yellowish brown.	
			25		0.2			Sand, medium to coarse, grayish orange to yellow gray, with gravels.	
			26		0.2				
50			27		0.2				
			28		BG				
55			29	75	BG				
			30		BG				
			31		BG		GP		
60			32		BG				
			33		BG				
65			34	80	BG				
			35		BG				
			36		BG				
70			37		BG				
			38		0.2				
75			39	80	0.2				
			40		BG				
			41		BG		SC	Silty sand, fine, yellowish orange to yellow gray.	205.8
80							CL		203.8

WELL DIAGRAM



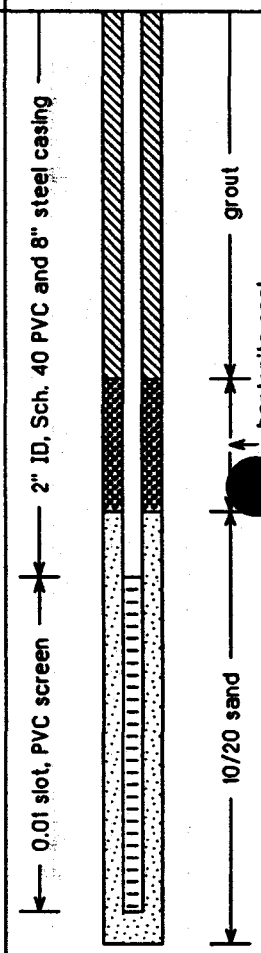
EnSafe/Allen & Hoshall

Monitoring Well 07MW03UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.83 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.47 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *26.48 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.99 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *115.0 feet*
Geologist: *Ben Brantley*	Well Screen: *97 to 107 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									283.8
			42		BG			Clay, dusky brown to olive gray, with light gray sand.	
			43		BG				
85			44	105	BG				
			45		BG				
			46		BG				
90			47		BG			Lignitic from 91'-93'.	
			48		BG				
95			49	105	BG				
			50		BG		CL		
			51		BG				
100			52		BG				
			53		BG				
105			54	100	BG			Clay, dusky brown, waxy, contains less sand.	
			55		BG				
			56		BG				
110			57		BG				
			58		BG				
115			59	110	BG				168.8
								End of boring at 115'.	
120									

WELL DIAGRAM



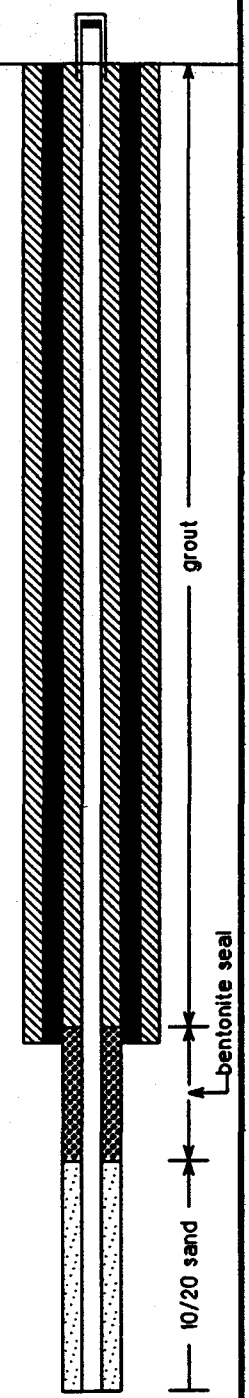
EnSafe/Allen & Hoshall

Monitoring Well 07MW03UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.72 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.25 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *25.25 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.00 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45.0 feet*
Geologist: *Ben Brantley*	Well Screen: *69.5 to 79.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown to moderate yellowish brown, moist.	
5			1	40	BG				
10			2	120	BG				
15			3	100	BG		ML	Clayey silt, olive black, moist, soft.	
20			4	90	BG			Clayey silt, dark yellowish brown, medium stiff.	
25			5	90	BG			Clayey silt, moderate brown with yellow gray silt, organics.	
30			6	100	BG			Clayey silt with sand, moderate brown.	253.7
								Silty clayey sand, yellowish orange to yellowish brown.	
35			7	100	BG		SC	Silty sand, yellowish orange to reddish brown, fine to medium grained.	
40			8	120	BG				

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well 07MW03UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.72 feet msl*
Started at *1630 on 2-07-95*	TOC Elevation: *283.25 feet msl*
Completed at *1500 on 2-14-95*	Depth to Groundwater: *25.25 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.00 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45.0 feet*
Geologist: *Ben Brantley*	Well Screen: *69.5 to 79.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SC	Sand, yellowish gray, fine.	242.7	
								Sand, medium, yellowish orange to yellowish brown.		10/20 sand
45			9	120	BG			Log information taken from the boring for the Cockfield well at SWMU#7 Site 3.		
50										
55										
60										
65										
70										
75										
80										

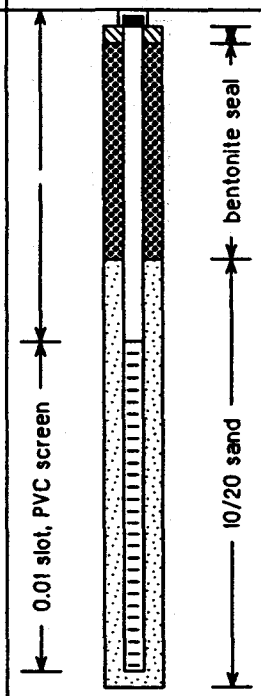
EnSafe/Allen & Hoshall

Monitoring Well 07MW04LS
Boring 07MW04LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X							Clayey silt, moderate brown, stiff.	
5	X		1	62.5	BG				
10	X		2	50	BG		ML		
15	X		3	60	BG			Clayey silt, dark yellow brown, medium stiff, moist.	
								Clayey silt, moderate yellow with reddish brown, hard.	
20			4	80	BG			Log information taken from the boring for the Cockfield well at SWMU#7 Site 4. Monitoring well closed in place on 3/07/95 due to the absence of groundwater. Well was closed by drilling out the well and grouting up the remaining borehole.	
25									
30									
35									
40									

WELL DIAGRAM



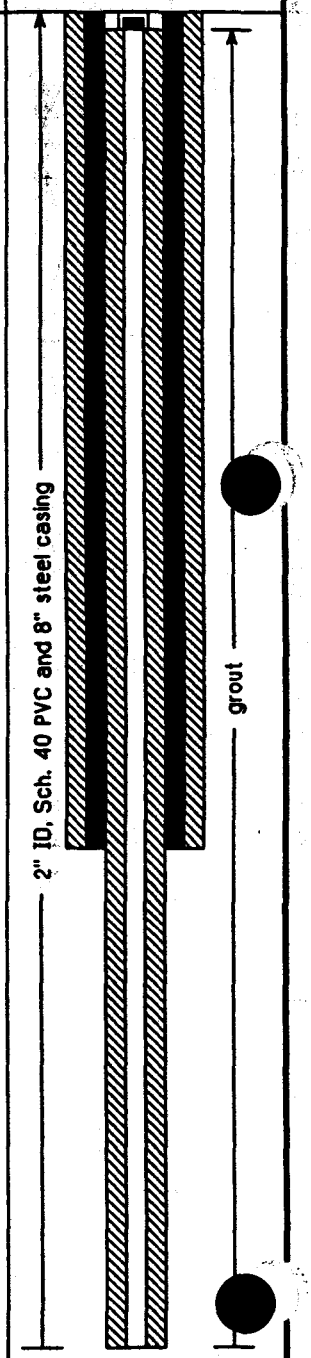
EnSafe/Allen & Hoshall

Monitoring Well 07MW04LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.81 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.20 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *25.28 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.92 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *70.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *60 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown, stiff.	
5			1	62.5	BG				
10			2	50	BG				
							ML		
15			3	60	BG			Clayey silt, dark yellow brown, medium stiff, moist..	
								Clayey silt, moderate yellow with reddish brown, hard.	
20			4	80	BG				
25			5	80	BG			Clay, silty, trace sand, very fine, moderate reddish brown, stiff.	
									258.8
								Sand, clayey, silty, finely micaceous, moderate reddish orange to moderate reddish brown.	
30									
							SC		
35			6	110	BG			Sand, very fine to fine, silty, clayey, laminated, small clay casts, pale orange to moderate red.	
40									

WELL DIAGRAM



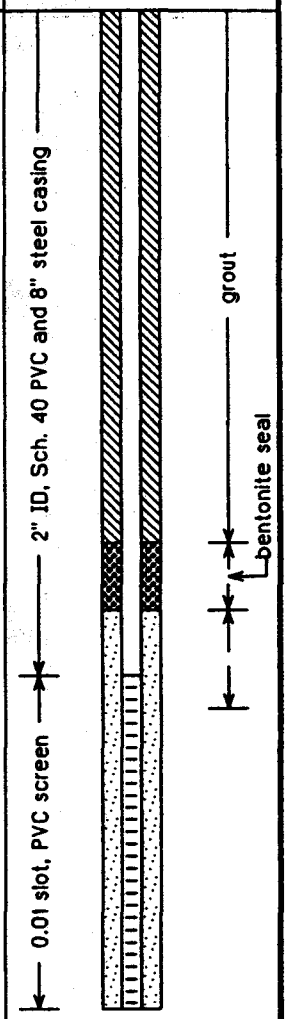
EnSafe/Allen & Hoshall

Monitoring Well 07MW04LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.81 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.20 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *25.28 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.92 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *70.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *60 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SC	Sand, very fine to fine, silty, some clay, dark yellowish orange to grayish orange, wet.	
45			7	105	BG			Sand, gravelly, clay balls, grayish orange to moderate yellowish brown.	238.8
50									
55			8	100	BG		GP	Sand with gravel, fine to coarse, grayish orange to moderate yellowish brown, wet.	
60									
65			9	100	BG			Gravel, sandy, moderate yellowish brown to dark yellowish orange.	
70									213.8
								Log information taken from the boring for the Cockfield well at SWMU#7 Site 4.	
75			10	100	BG				
80									

WELL DIAGRAM



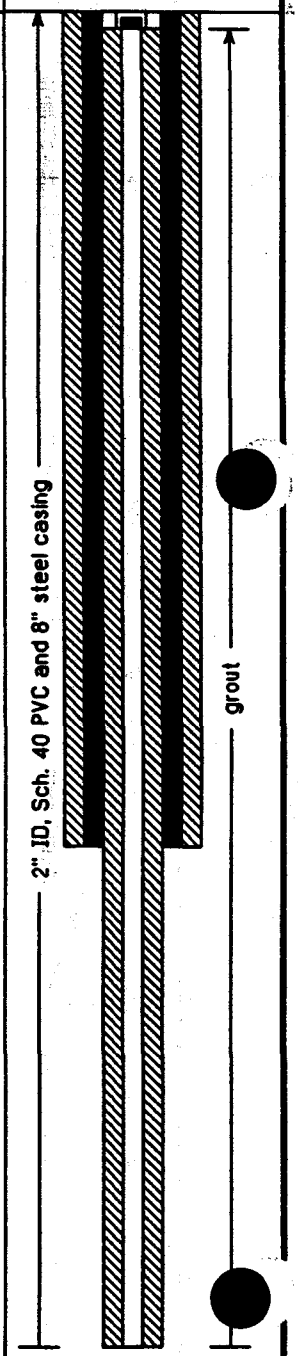
EnSafe/Allen & Hoshall

Monitoring Well 07MW04C
(007G04UC)

Project: *NAS Memphis*	Location: *Millington, TN SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.89 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.59 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *29.67 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.92 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *145.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *128 to 138 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1		BG		ML	Clayey silt, moderate brown, stiff.	
			2		BG				
5			3	62.5	BG				
			4		BG				
			5		BG				
10			6	50	BG				
			7		BG				
			8		BG				
15				60				Clayey silt, dark yellow brown, medium stiff, moist..	
			9		BG				
			10		BG			Clayey silt, moderate yellow with reddish brown, hard.	
20			11	80	BG				
			12		BG				
25			13	80	BG			Clay, silty, trace sand, very fine, moderate reddish brown, stiff.	
			14		BG				258.9
			15		BG		SC	Sand, clayey, silty, finely micaceous, moderate reddish orange to moderate reddish brown.	
30			16		BG				
			17		BG				
35			18	110	BG			Sand, very fine to fine, silty, clayey, laminated, small clay casts, pale orange to moderate red.	
			19		BG				
40			20		BG				

WELL DIAGRAM



EnSafe/Allen & Hoshall

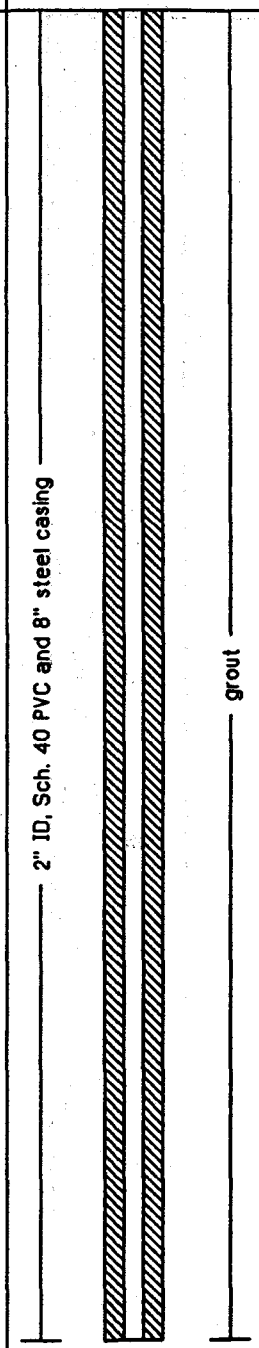
Monitoring Well 07MW04C

(007G04UC)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.89 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.59 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *29.67 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.92 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *145.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *128 to 138 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			21		BG		SC	Sand, very fine to fine, silty, some clay, dark yellowish orange to grayish orange, wet.	
			22		BG				
45			23	105	BG				238.9
			24		BG			Sand, gravelly, clay balls, grayish orange to moderate yellowish brown.	
			25		BG				
50			26		BG				
			27		BG				
55			28	100	BG			Sand with gravel, fine to coarse, grayish orange to moderate yellowish brown, wet.	
			29		BG		GP		
			30		BG				
60			31		BG				
			32		BG				
65			33	100	BG			Gravel, sandy, moderate yellowish brown to dark yellowish orange.	
			34		BG				
			35		BG				
70			36		BG			Sand, very fine to fine, silty, clayey, laminated, light brownish gray to grayish brown, stiff, micaceous, moist.	213.9
			37		BG				
75			38	100	BG		SC	Sand, very fine to fine with clay streaks, pale orange to yellowish gray stained dark yellowish orange.	
			39		BG				
			40		BG				
80									

WELL DIAGRAM



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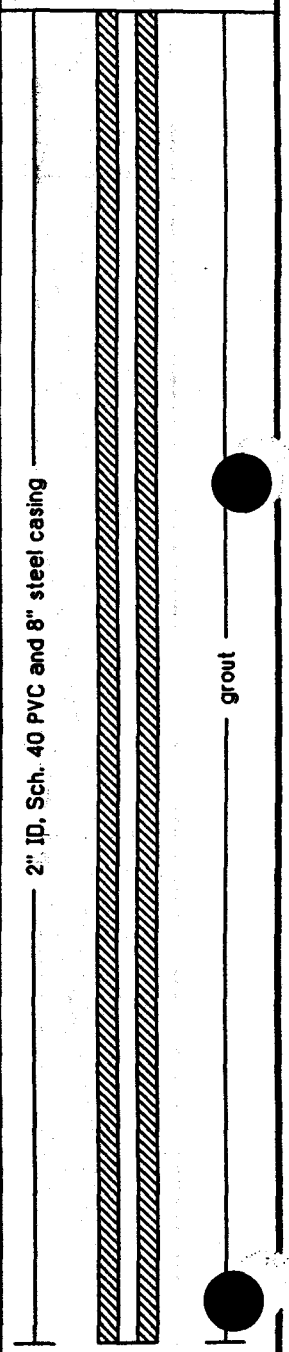
Monitoring Well 07MW04C

(007G04UC)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.89 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.59 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *29.67 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.92 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *145.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *128 to 138 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
			41		BG					
			42		BG			Sand, very fine to fine, with clay streaks, yellowish gray to very pale orange, stained dark yellowish orange, very wet.		
85			43	100	BG					
			44		BG			Sand, very fine to fine, clayey, laminated, pale brown to moderate brown, wet.		
			45		BG			Sand, very fine to fine, laminated, medium gray to grayish brown, with occassional lignite chips.		
90			46		BG					
			47		BG					
95			48	100	BG					
			49		BG					
			50		BG					
100			51		BG		SC			
			52		BG					
105			53		BG					
			54	109	BG					
			55		BG					
110			56		BG					
			57		BG					
115			58	100	BG					
			59		BG					
			60		BG					
120										



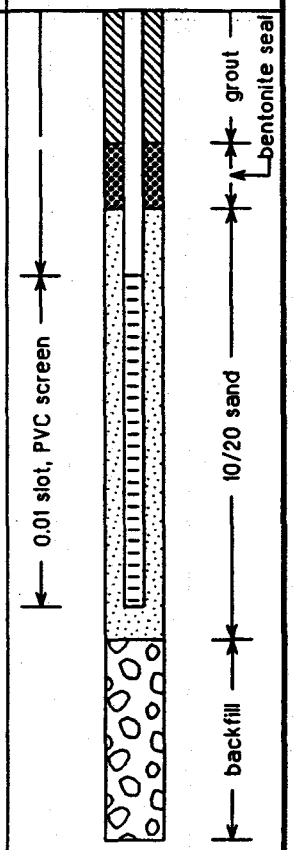
EnSafe/Allen & Hoshall

Monitoring Well 07MW04C
(007G04UC)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.89 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.59 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *29.67 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.92 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *145.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *128 to 138 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			61		BG			Sand, very fine to fine, clayey with lignitic chips, light brownish gray to grayish brown, clayey zones are stiff, wet.	
			62		BG				
125			63	100	BG				
			64		BG				
			65		BG				
130			66		BG		SC		
			67		BG				
135			68	120	BG			Sand, very fine to fine, lignitic, light brownish gray to grayish brown, cohesive in clayey zones, wet.	
			69		BG			Lignitic, dusky brown, hard.	
			70		BG				
140									143.9
			71		BG			Clay, silty, traces of sand, laminated dark brownish gray, color changes below 141', stiff.	
			72		BG		CL		
145			73	100	BG				138.9
								End of boring at 145'.	
150									
155									
160									

WELL DIAGRAM



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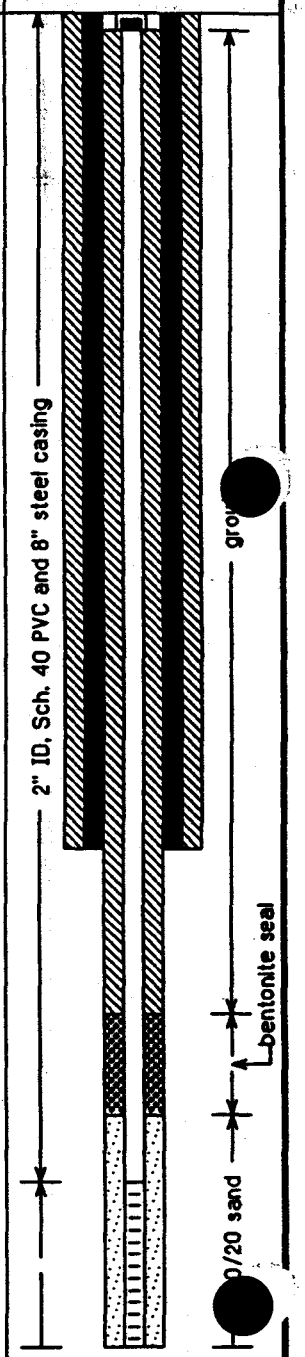
Monitoring Well 07MW04UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *283.80 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.29 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *25.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.91 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *35 to 45 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown, stiff.	
5			1	62.5	BG				
10			2	50	BG				
							ML		
15			3	60	BG			Clayey silt, dark yellow brown, medium stiff, moist..	
								Clayey silt, moderate yellow with reddish brown, hard.	
20			4	80	BG				
25			5	80	BG			Clay, silty, trace sand, very fine, moderate reddish brown, stiff.	
								Sand, clayey, silty, finely micaceous, moderate reddish orange to moderate reddish brown.	258.8
30									
							SC		
35			6	110	BG			Sand, very fine to fine, silty, clayey, laminated, small clay casts, pale orange to moderate red.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well 07MW04UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *283.80 feet msl*
Started at *0900 on 1-09-95*	TOC Elevation: *283.29 feet msl*
Completed at *0910 on 2-16-95*	Depth to Groundwater: *25.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.91 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *35 to 45 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
	X						SC	Sand, very fine to fine, silty, some clay, dark yellowish orange to grayish orange, wet.		10/20 sand
45			7	105	BG			Log information taken from the boring for the Cockfield well at SWMU#7 Site 4.	238.8	
50										
55										
60										
65										
70										
75										
80										

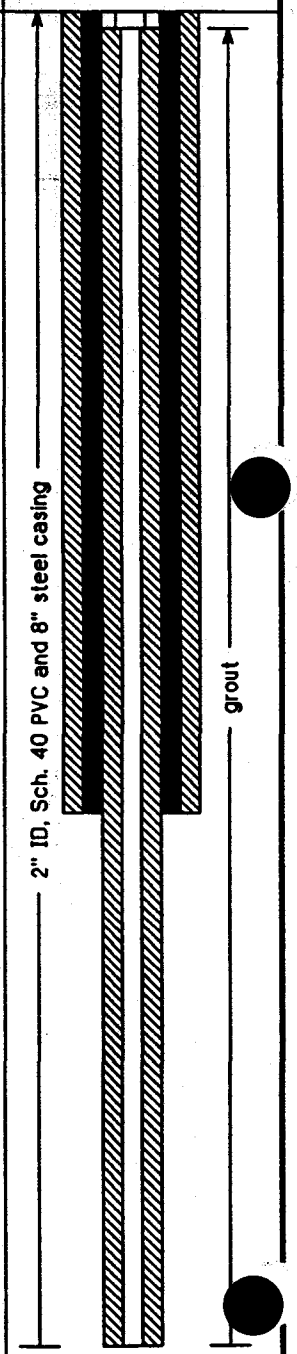
EnSafe/Allen & Hoshall

Monitoring Well 07MW05LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building*
Project No.: *N0094*	Surface Elevation: *282.792 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.281 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *26.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.28 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *76.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *66 to 76 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown to yellowish brown, trace of organics.	
5			1	75	BG				
10			2	60	BG				
15			3	100	BG		ML	Clayey silt, dark yellowish brown, stiff, hard.	
20			4	90	BG				
25									
30			5	90	BG				
								Sandy clay, fine, medium light brown, soft, wet.	250.3
35			6	90	BG		SC	Silty sand, medium, light brown, grayish orange to yellow gray.	
40									

WELL DIAGRAM



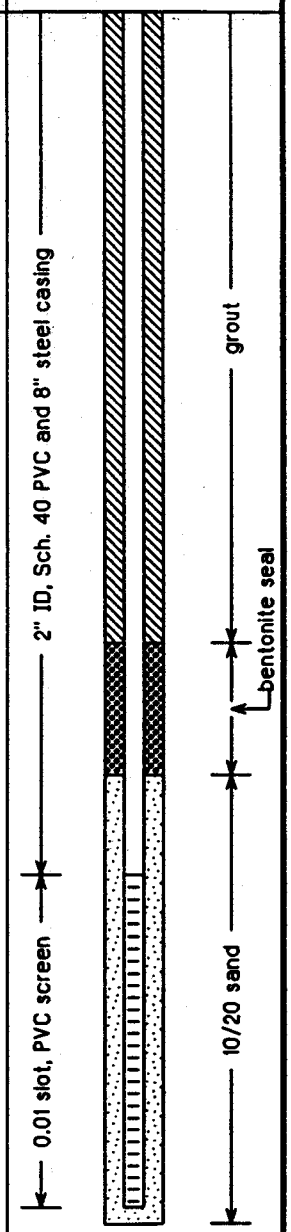
EnSafe/Allen & Hoshall

Monitoring Well 07MW05LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building*
Project No.: *N0094*	Surface Elevation: *282.792 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.281 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *26.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.28 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *76.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *66 to 76 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SC	Silty sand, medium, yellowish orange to light brown.	
45								Sand, medium, micaceous, yellowish orange to light brown.	237.8
50								Sand, medium, grayish orange, micaceous.	
55			7	60	BG				
60							GP		
65								Gravelly sand, coarse to very coarse, dark yellowish orange.	
70									
75			8	87.5	BG				206.8
								Log information taken from the boring for the Cockfield well at SWMU#7 Site 5.	
80									

WELL DIAGRAM



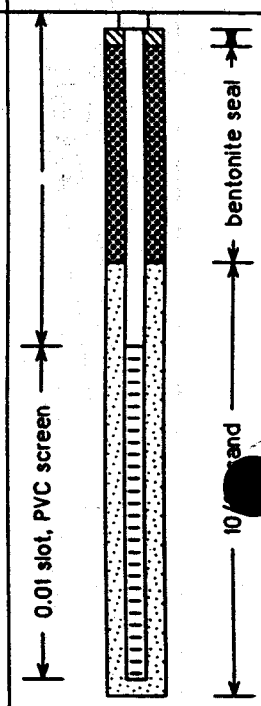
EnSafe/Allen & Hoshall

Monitoring Well 07MW05LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.65 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.43 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X							Clayey silt, moderate brown to yellowish brown, trace of organics.	
5	X		1	75	BG				
10	X		2	60	BG		ML		
15	X		3	100	BG			Clayey silt, dark yellowish brown, stiff, hard.	
20	X		4	90	BG				262.6
								Log information taken from the boring for the Cockfield well at SWMU#7 Site 5.	
25									
30									
35									
40									

WELL DIAGRAM



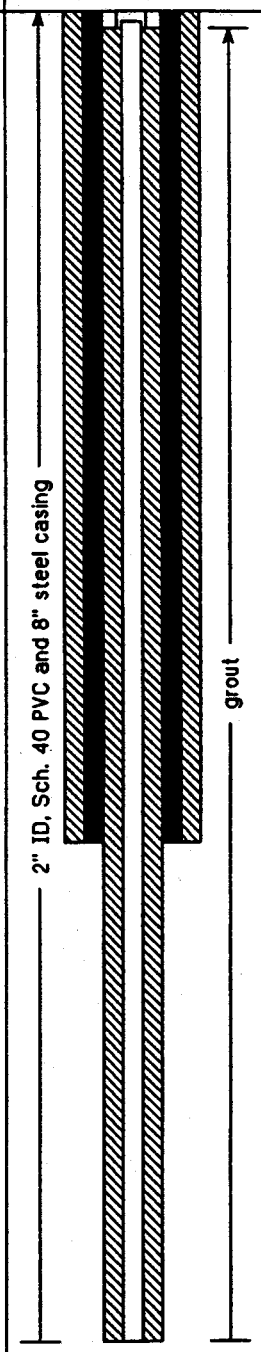
EnSafe/Allen & Hoshall

Monitoring Well 07MW05UC

Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *282.67 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.39 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *N/A feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *N/A feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *135.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *122 to 132 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1		BG			Clayey silt, moderate brown to yellowish brown, trace of organics.	
			2		BG				
5			3	75	BG				
			4		BG				
10			5	60	BG				
			6		BG				
			7		BG				
15			8	100	BG		ML	Clayey silt, dark yellowish brown, stiff, hard.	
			9		BG				
20			10	90	BG				
			11		BG				
			12		BG				
25			13		BG				
			14		BG				
30			15	90	BG				
			16		BG				250.2
			17		BG			Sandy clay, fine, medium light brown, soft, wet.	
35			18	90	BG		SC	Silty sand, medium, light brown, grayish orange to yellow gray.	
			19		BG				
40			20		BG				

WELL DIAGRAM



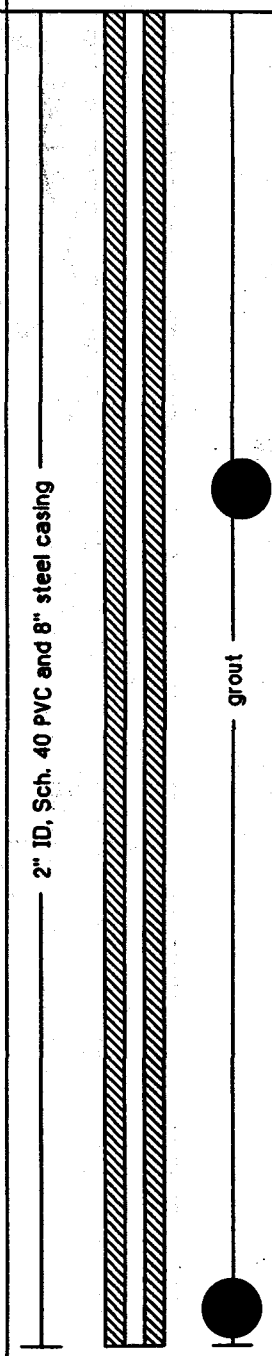
EnSafe/Allen & Hoshall

Monitoring Well 07MW05UC

Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *282.67 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.39 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *N/A feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *N/A feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *135.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *122 to 132 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			21		BG		SC	Silty sand, medium, yellowish orange to light brown.	
			22		BG				
45									237.7
			23		BG			Sand, medium, micaceous, yellowish orange to light brown.	
			24		BG			Sand, medium, grayish orange, micaceous.	
50			25		BG				
			26		BG				
			27		BG				
55				60					
			28		BG				
			29		BG				
60			30		BG		GP		
			31		BG				
			32		BG				
65			33		BG			Gravelly sand, coarse to very coarse, dark yellowish orange.	
			34		BG				
70			35		BG				
			36		BG				
			38		BG				
75				87.5					
			39		BG				206.7
			40		BG		SC	Silty sand, fine, brownish gray, with thin dark yellow clay lenses.	
80			41		BG				

WELL DIAGRAM



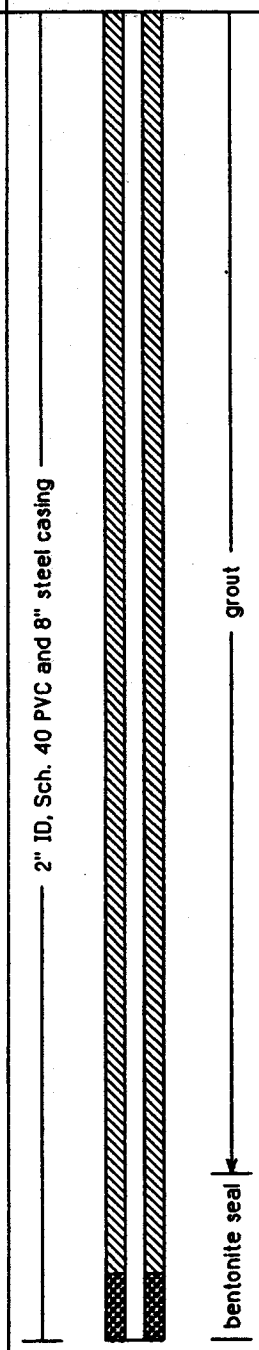
EnSafe/Allen & Hoshall

Monitoring Well 07MW05UC

Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *282.67 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.39 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *N/A feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *N/A feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *135.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *122 to 132 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			42		BG				
			43		BG				
85			44		BG				
			45		BG				
90			46		BG				
			47		BG				
			48		BG				
95			49	80	BG				
			50		BG				
100			51		BG		SC	Sand, fine, brownish gray with dark yellow brown clay lenses.	
			52		BG				
			53		BG				
105			54		BG				
			56		BG				
110			57		BG				
			58		BG				
			59		BG				
115			60	90	BG				
			61		BG				
120			62		BG				

WELL DIAGRAM



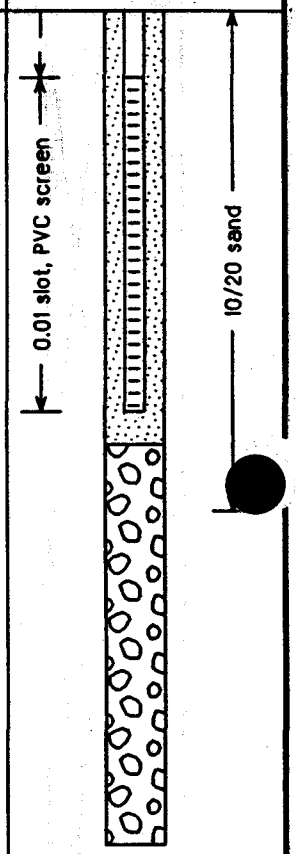
EnSafe/Allen & Hoshall

Monitoring Well 07MW05UC

Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *282.67 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.39 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *N/A feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *N/A feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *135.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *122 to 132 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			63		BG		SC	Clay, dusky brown, waxy, from 119' to 119.5'. Sand, fine, brownish gray with clay lenses described above.	
125			64		BG				
			65		BG				
			66		BG				154.7
130			67		BG		CL	Clay, dusky brown, waxy, mixed with lignitic sand.	
			68		BG				
			69		BG				
135				90				End of boring at 135'.	147.7
140									
145									
150									
155									
160									

WELL DIAGRAM



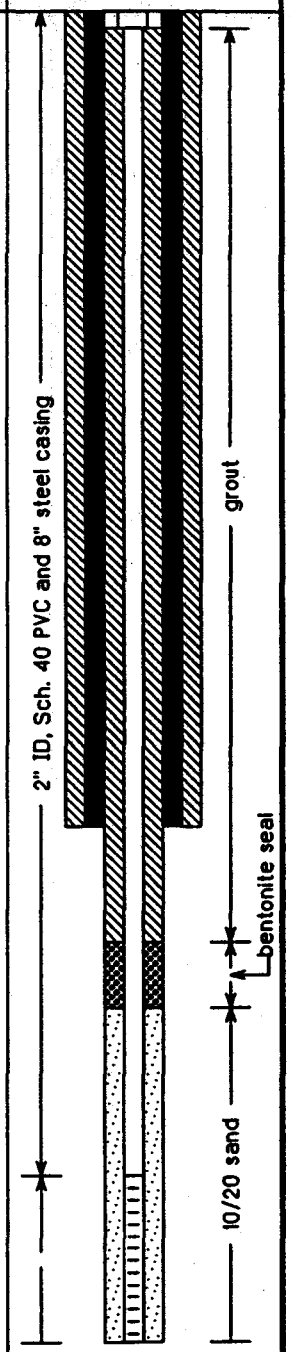
EnSafe/Allen & Hoshall

Monitoring Well 07MW05UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.81 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.43 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *24.95 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.48 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *35 to 45 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown to yellowish brown, trace of organics.	
5			1	75	BG				
10			2	60	BG				
15			3	100	BG		ML	Clayey silt, dark yellowish brown, stiff, hard.	
20			4	90	BG				
25									
30			5	90	BG				
								Sandy clay, fine, medium light brown, soft, wet.	250.3
35			6	90	BG		SC	Silty sand, medium, light brown, grayish orange to yellow gray.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well 07MW05UF

Project: *NAS Memphis*	Location: *Millington, TN SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *282.81 feet msl*
Started at *on 1-09-95*	TOC Elevation: *282.43 feet msl*
Completed at *on 2-21-95*	Depth to Groundwater: *24.95 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.48 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *35 to 45 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
	X						SC	Silty sand, medium, yellowish orange to light brown.		10/20 sand
45									237.8	
								Log information taken from the boring for the Cockfield well at SWMU#7 Site 5.		
50										
55			7	60	BG					
60										
65										
70										
75										
80										

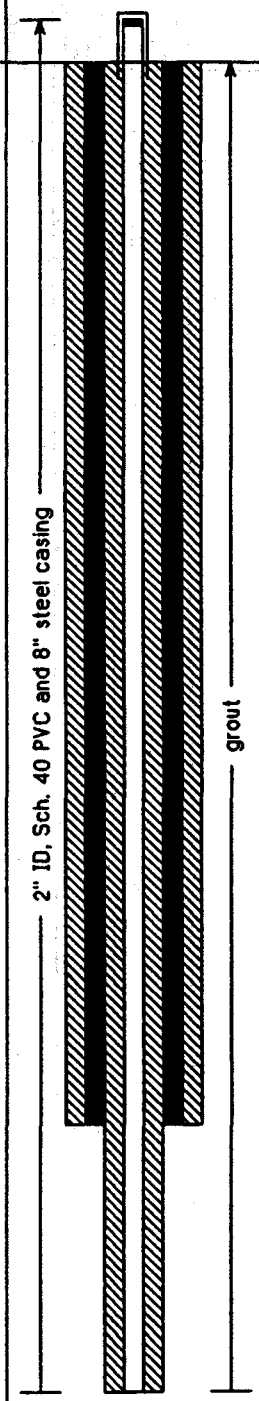
EnSafe/Allen & Hoshall

Monitoring Well 07MW06LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *284.12 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.52 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *28.32 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.20 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *78.0 feet*
Geologist: *Ben Brantley*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and brick.	
			1	66	BG			Clayey silt, moderate yellowish brown, mottled with yellow gray.	
5									
10			2	70	BG				
15			3	70	BG		ML		
20									
25			4	60	BG			Clayey silt, olive brown to olive gray, hard, stiff.	
30								Clayey silt, light brown to yellowish brown, medium stiff.	
			5	85	BG				
35							SC	Silty clayey sand, fine to very fine, yellowish orange to reddish brown.	250.1
40									

WELL DIAGRAM



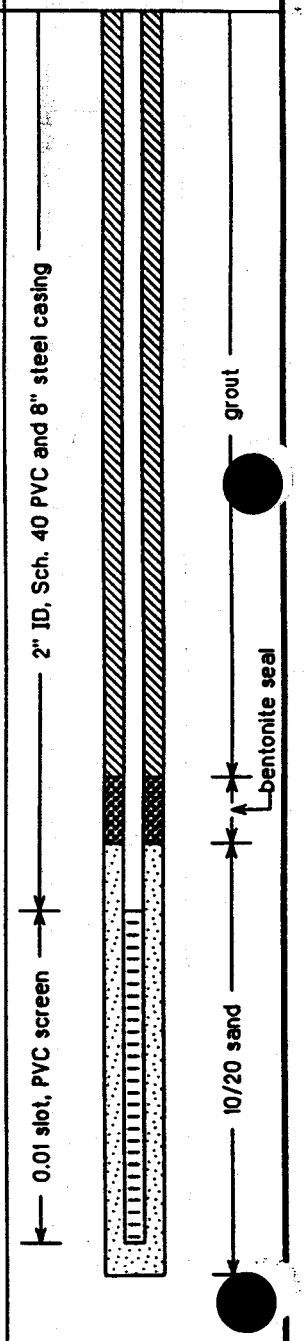
EnSafe/Allen & Hoshall

Monitoring Well 07MW06LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *284.12 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.52 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *28.32 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.20 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *78.0 feet*
Geologist: *Ben Brantley*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			6	54	BG		SC	Silty sand, very fine to fine, traces of clay casts, grayish orange to pale yellowish orange.	
50									
55			7	100	BG			Sand, fine to coarse, pale yellowish brown to moderate yellowish brown.	229.1
60									
65			8	70	BG		GP		
70									
75			9	100	BG				206.6
80								Log information taken from the boring for the Cockfield well at SWMU#7 site 6.	

WELL DIAGRAM



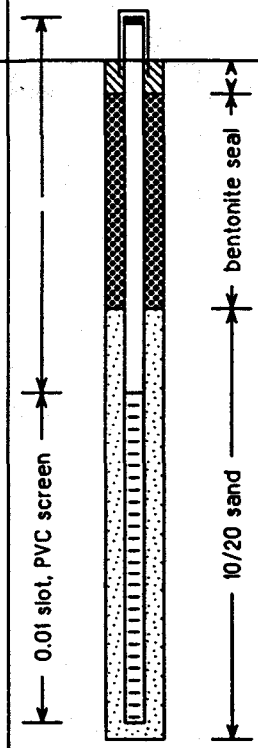
EnSafe/Allen & Hoshall

Monitoring Well 07MW06LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *284.33 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.37 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *12.49 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *273.88 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ben Brantley*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X							Fill and brick.	
	X		1	66	BG			Clayey silt, moderate yellowish brown, mottled with yellow gray.	
5	X								
10	X		2	70	BG		ML		
15	X		3	70	BG				
20	X								264.3
								Log information taken from the boring for the Cockfield well at SWMU#7 site 6.	
25			4	60	BG				
30									
35									
40									

WELL DIAGRAM



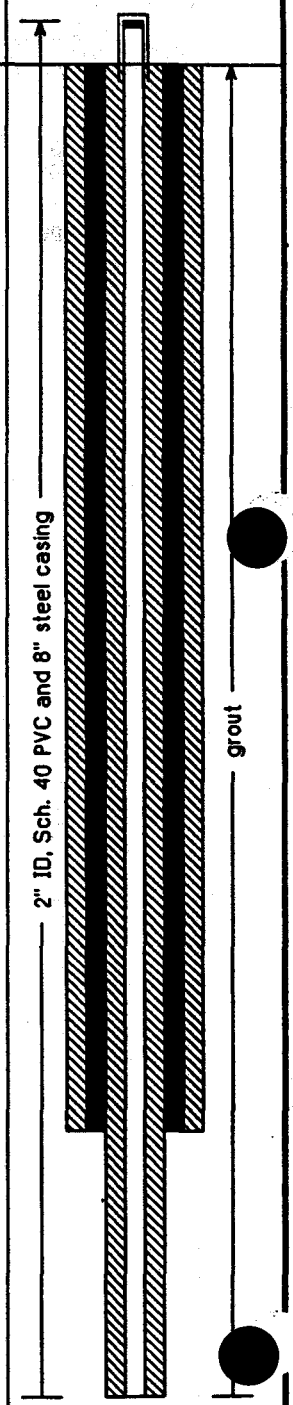
EnSafe/Allen & Hoshall

Monitoring Well 07MW06UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *284.17 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.49 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *28.25 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.24 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *101.0 feet*
Geologist: *Ben Brantley*	Well Screen: *84.5 to 94.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and brick.	
				66				Clayey silt, moderate yellowish brown, mottled with yellow gray.	
5			1		BG				
			2		BG				
			3		BG				
10			4	70	BG				
			5		BG				
15			6	70	BG				
			7		BG		ML		
			8		BG				
20			9		BG				
			10		BG				
25			11	60	BG			Clayey silt, olive brown to olive gray, hard, stiff.	
			12		BG				
			13		BG			Clayey silt, light brown to yellowish brown, medium stiff.	
30			14		BG				
			15	85	BG				
35			16		BG			Silty clayey sand, fine to very fine, yellowish orange to reddish brown.	250.2
			17		BG		SC		
			18		BG				
40									

WELL DIAGRAM



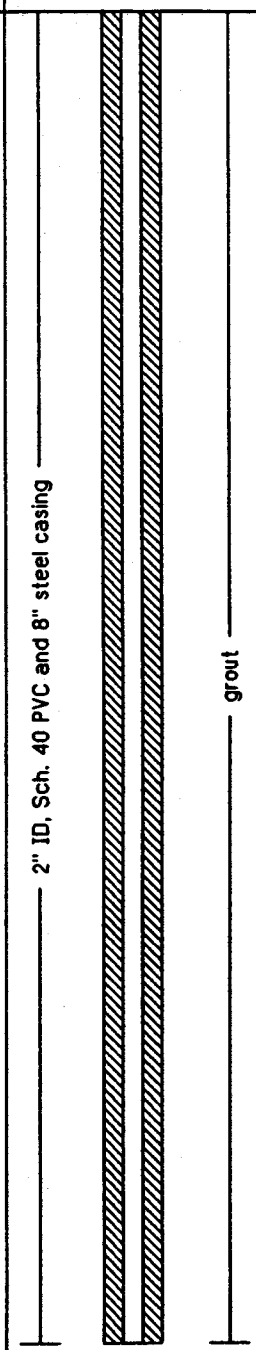
EnSafe/Allen & Hoshall

Monitoring Well 07MW06UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *284.17 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.49 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *28.25 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.24 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *101.0 feet*
Geologist: *Ben Brantley*	Well Screen: *84.5 to 94.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			19		BG				
			20		BG				
45			21	54	BG			Silty sand, very fine to fine, traces of clay casts, grayish orange to pale yellowish orange.	
			22		BG		SC		
			23		BG				
50			24		BG				
			25		BG				
55			26	100	BG				229.2
			27		BG			Sand, fine to coarse, pale yellowish brown to moderate yellowish brown.	
			28		BG				
60			29		BG				
			30		BG				
65			31	70	BG				
			32		BG		GP		
			33		BG				
70			34		BG				
			35		BG				
75			36	100	BG				
			37		BG				206.7
			38		BG		SC	Silt clayey, finely laminated, pale yellowish orange to dark yellowish orange.	
80									

WELL DIAGRAM



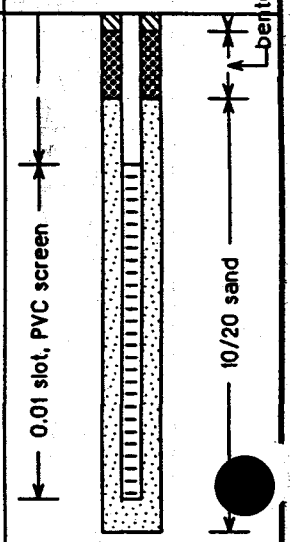
EnSafe/Allen & Hoshall

Monitoring Well 07MW06UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *284.17 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.49 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *28.25 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.24 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *101.0 feet*
Geologist: *Ben Brantley*	Well Screen: *84.5 to 94.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			39		BG			Silty clay with fine sand, light brownish gray to grayish brown, micaceous, soft to stiff, moist.	
			40		BG				
85			41		BG				
			42	109	BG		SC		
			43		BG				
90			44		BG				
			45		BG				
									190.2
95			46		BG			Clay, interbedded very fine sand with silt, becoming more waxy.	
			47	120	BG		CL		
			48		BG				
100			49	120	BG				183.2
								End of boring	
105									
110									
115									
120									

WELL DIAGRAM



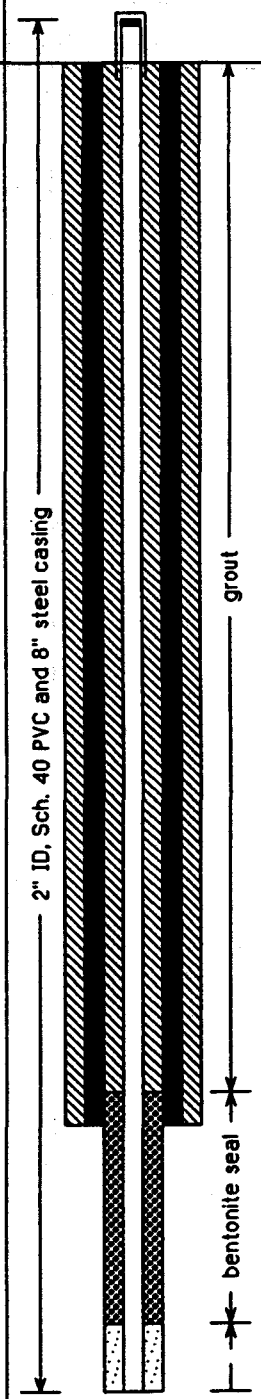
EnSafe/Allen & Hoshall

Monitoring Well 07MW06UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *284.39 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.48 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *37.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *249.48 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *55.0 feet*
Geologist: *Ben Brantley*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill and brick.	
			1	66	BG			Clayey silt, moderate yellowish brown, mottled with yellow gray.	
5									
10			2	70	BG				
15			3	70	BG		ML		
20									
25			4	60	BG			Clayey silt, olive brown to olive gray, hard, stiff.	
								Clayey silt, light brown to yellowish brown, medium stiff.	
30			5	85	BG				
35							SC	Silty clayey sand, fine to very fine, yellowish orange to reddish brown.	250.4
40									

WELL DIAGRAM



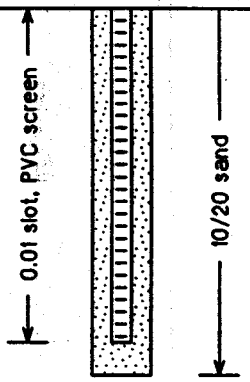
EnSafe/Allen & Hoshall

Monitoring Well 07MW06UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *284.39 feet msl*
Started at *0820 on 2-10-95*	TOC Elevation: *286.48 feet msl*
Completed at *1010 on 2-14-95*	Depth to Groundwater: *37.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *249.48 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *55.0 feet*
Geologist: *Ben Brantley*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45	X		6	54	BG		SC	Silty sand, very fine to fine, traces of clay casts, grayish orange to pale yellowish orange.	
50	X								234.4
55	X		7	100	BG			Log information taken from the boring for the Cockfield well at SWMU#7 site 6.	
60									
65									
70									
75									
80									

WELL DIAGRAM



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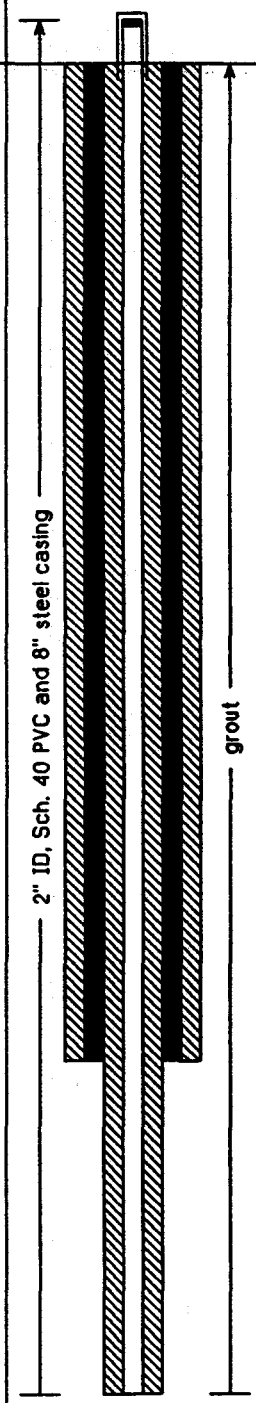
Monitoring Well 07MW07LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *282.35 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *283.68 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *25.86 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.82 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *77.0 feet*
Geologist: *Ben Brantley*	Well Screen: *68.0 to 78.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate yellowish brown, organics, mottled with yellowish gray silt.	
5			1	125	BG				
10			2	70	BG				
15			3	80	BG			Clayey silt, light olive gray to olive brown, soft, moist.	
							ML		
20									
25			4	65	BG				
								Silty clay, light brown to moderate yellowish brown.	
30									
35			5	90	BG				
								Silty sand, moderate yellowish brown to dark yellowish orange, stained reddish brown.	246.9
							SC		
							GP		243.4
40									

WELL DIAGRAM



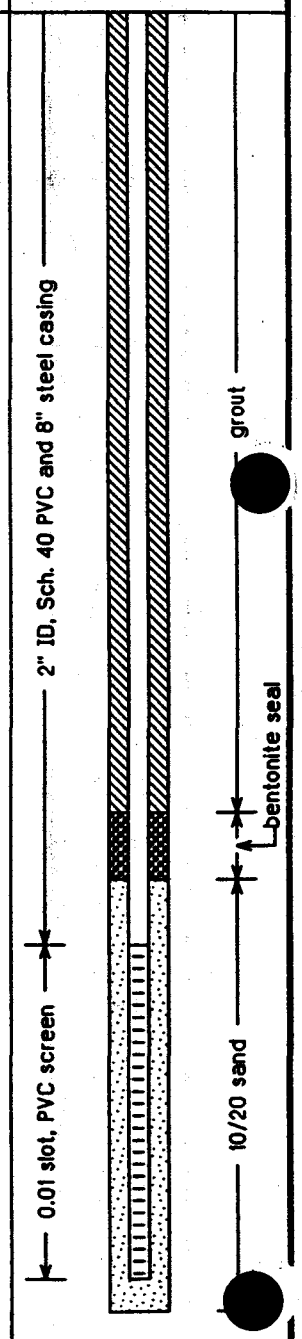
EnSafe/Allen & Hoshall

Monitoring Well 07MW07LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.35 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *283.68 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *25.86 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.82 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *77.0 feet*
Geologist: *Ben Brantley*	Well Screen: *68.0 to 78.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Sand, fine to medium, silty, grayish orange to dark yellowish orange, at 39' there is some gray sand.	
45			6	110	BG				
50									
55			7	90	BG				
60							GP	Sand and gravel, fine to very coarse grained, grayish orange to dark yellowish orange.	
65			8	110	BG				
70								Sand with interdisbursed clay, fine to medium grained. Clay is pinkish gray, moist.	
75			9	95	BG				
									203.9
80								Log information taken from the boring for the Cockfield well at SWMU#7 site 7.	

WELL DIAGRAM



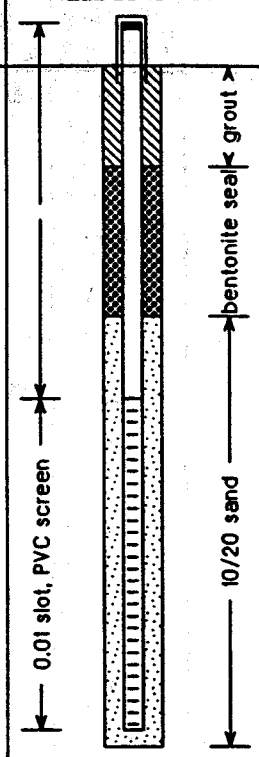
EnSafe/Allen & Hoshall

Monitoring Well 07MW07LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.47 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *284.44 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *11.0 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *273.44 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ben Brantley*	Well Screen: *10.0 to 20.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate yellowish brown, organics, mottled with yellowish gray silt.	
5			1	125	BG				
10			2	70	BG		ML		
15			3	80	BG			Clayey silt, light olive gray to olive brown, soft, moist.	
20								Log information taken from the boring for the Cockfield well at SWMU#7 site 7.	262
25			4	65	BG				
30									
35									
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

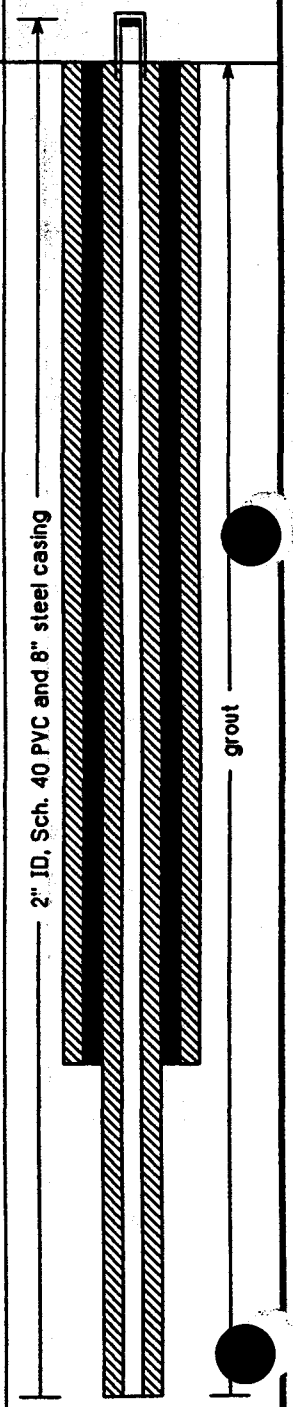
Monitoring Well 07MW07C

(007G07UC)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *281.83 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *283.94 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *27.99 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *105.0 feet*
Geologist: *Ben Brantley*	Well Screen: *92.5 to 102.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1		0.4			Clayey silt, moderate yellowish brown, organics, mottled with yellowish gray silt.	
			2		BG				
5			3	125	BG				
			4		BG				
10			5	70	BG				
			6		BG				
			7		BG				
15			8	80	BG			Clayey silt, light olive gray to olive brown, soft, moist.	
			9		BG		ML		
20			10		BG				
			11		BG				
			12		BG				
25			13	65	BG				
			14		BG			Silty clay, light brown to moderate yellowish brown.	
30			15		BG				
			16		BG				
			17		BG				
35				90					246.3
			18		BG		SC	Silty sand, moderate yellowish brown to dark yellowish orange, stained reddish brown.	
			19		BG		GP		242.8
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

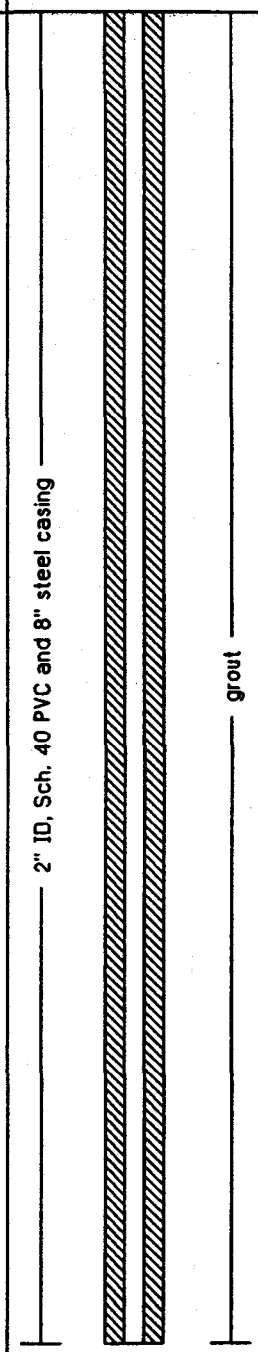
Monitoring Well 07MW07C

(007G07UC)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *281.83 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *283.94 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *27.99 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *105.0 feet*
Geologist: *Ben Brantley*	Well Screen: *92.5 to 102.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			20		BG			Sand, fine to medium, silty, grayish orange to dark yellowish orange, at 39' there is some gray sand.	
			21		BG				
45			22	110	BG				
			23		BG				
			24		BG				
50			25		BG				
			26		BG				
55			27	90	BG				
			28		BG				
			29		BG		GP		
60			30		BG			Sand and gravel, fine to very coarse grained, grayish orange to dark yellowish orange.	
			31		BG				
65			32	110	BG				
			33		BG				
			34		BG				
70			35		BG			Sand with interdisbursed clay, fine to medium grained. Clay is pinkish gray, moist.	
			36		BG				
75			37	95	BG				
			38		BG				
			39		BG		SC		203.3
80									

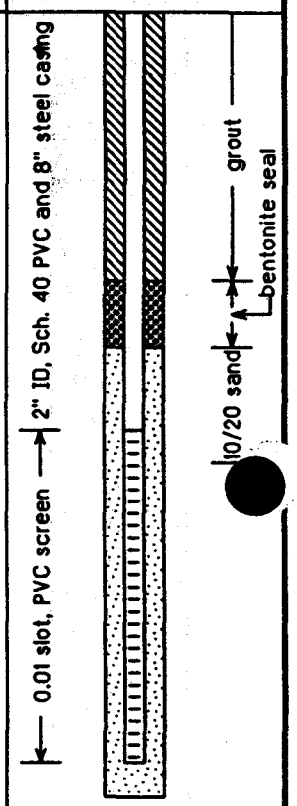
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 07MW07C (007G07UC)
Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *281.83 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *283.94 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *27.99 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *255.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *105.0 feet*
Geologist: *Ben Brantley*	Well Screen: *92.5 to 102.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			40		BG			Sand, interbedded with clay, grayish orange, then becomes silty sand, very fine grained, clay is dark yellowish orange.	
			41		BG				
85			42	100	BG			Silty sand, with interbedded clay, very fine sand, dusky yellowish brown clay to moderate brown, mottled with light olive to olive gray sand.	
			43		BG				
			44		BG				
90			45		BG		SC		
			46		BG				
95			47	120	BG				
			48		BG				
			49		BG				
100			50		BG				
			51		BG		CL	Clay, laminations of sand, dusky yellowish brown to moderate brown clay, light olive to olive gray sand, waxy.	179.8
105			52	115	BG			End of boring at 105'.	176.8
110									
115									
120									

WELL DIAGRAM



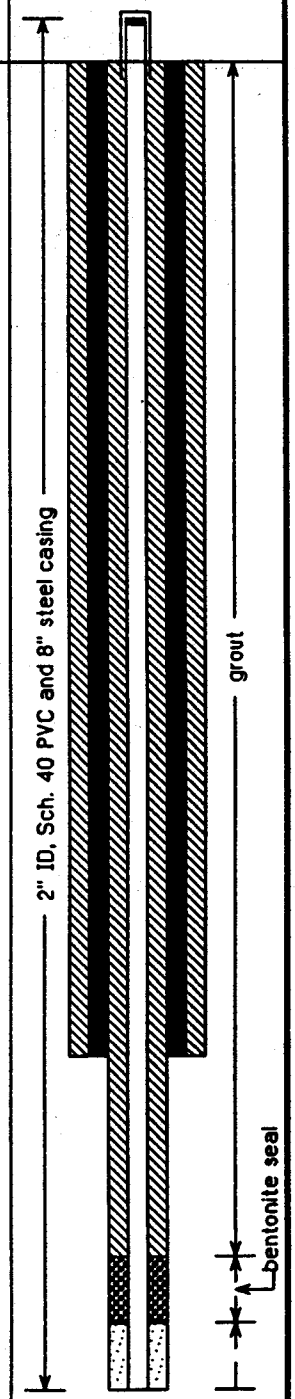
EnSafe/Allen & Hoshall

Monitoring Well 07MW07UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.35 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *283.97 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *26.16 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.81 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50.0 feet*
Geologist: *Ben Brantley*	Well Screen: *40.0 to 50.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X							Clayey silt, moderate yellowish brown, organics, mottled with yellowish gray silt.	
5	X		1	125	BG				
10	X		2	70	BG				
15	X		3	80	BG		ML	Clayey silt, light olive gray to olive brown, soft, moist.	
20	X								
25	X		4	65	BG				
30	X							Silty clay, light brown to moderate yellowish brown.	
35	X		5	90	BG				
							SC	Silty sand, moderate yellowish brown to dark yellowish orange, stained reddish brown.	246.9
40							GP		243.4

WELL DIAGRAM



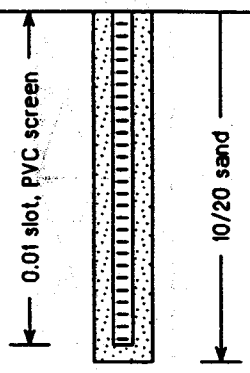
EnSafe/Allen & Hoshall

Monitoring Well 07MW07UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.35 feet msl*
Started at *1750 on 2-10-95*	TOC Elevation: *283.97 feet msl*
Completed at *on 2-14-95*	Depth to Groundwater: *26.16 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.81 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50.0 feet*
Geologist: *Ben Brantley*	Well Screen: *40.0 to 50.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45	X		6	110	BG		GP	Sand, fine to medium, silty, grayish orange to dark yellowish orange, at 39' there is some gray sand.	
50	X							Log information taken from the boring for the Cockfield well at SWMU#7 site 7.	231.9
55			7	90	BG				
60									
65									
70									
75									
80									

WELL DIAGRAM



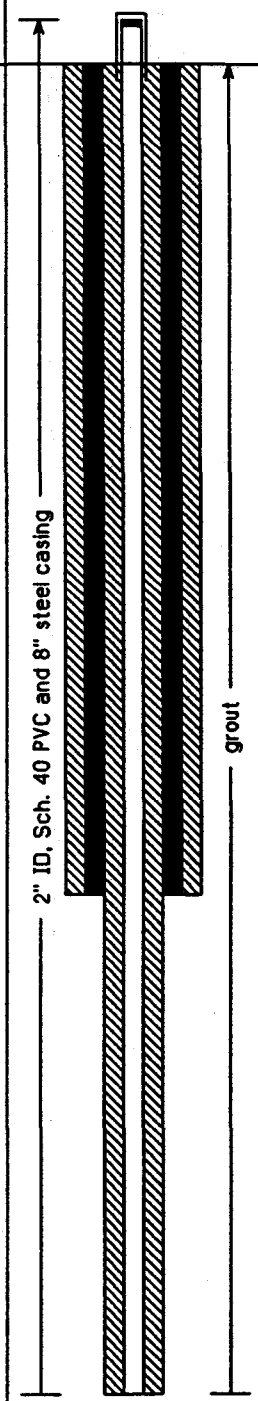
EnSafe/Allen & Hoshall

Monitoring Well 07MW08LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *280.86 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *282.95 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *25.86 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.59 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *76 feet*
Geologist: *David Ladd*	Well Screen: *66.0 to 76.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, yellowish brown, mottled yellowish gray.	
5			1	140	BG			Clayey silt, moderate brown, moist, soft.	
10			2	98	BG				
15			3	98	BG		ML	Clayey silt, olive gray, medium stiff to soft.	
20								Silt, light olive gray with brown mottling.	
25			4	85	BG			Silt, moderate to light brown, hard.	
30			5	80	BG			Sandy silt, moderate yellowish brown.	
									247.9
35			6	120	BG		GP	Sand, fine, dark yellowish orange mottled with grayish orange, silty. Sand, pale yellowish brown.	
40									

WELL DIAGRAM



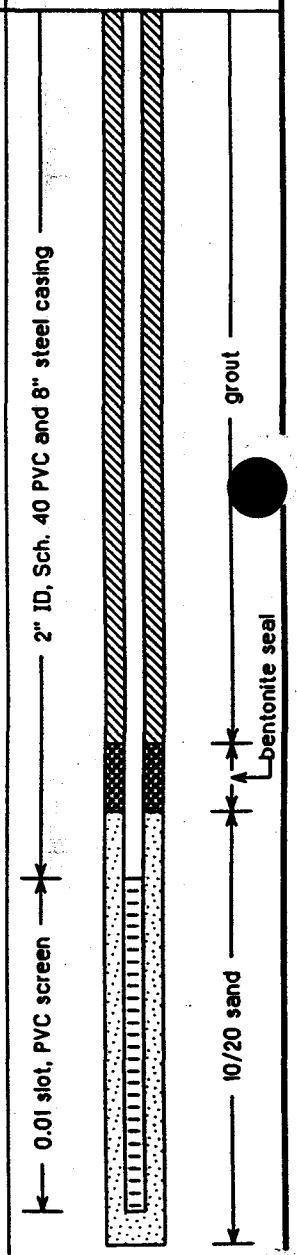
EnSafe/Allen & Hoshall

Monitoring Well 07MW08LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *280.86 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *282.95 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *25.86 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.59 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *76 feet*
Geologist: *David Ladd*	Well Screen: *66.0 to 76.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			7	80	BG			Sand, fine, grayish orange to dark yellowish orange, wet, scattered gravel.	
50									
55			8	95	BG				
60							GP		
65			9	90	BG			Sand and gravel, fine to very coarse grained, grayish orange to dark yellowish orange, gravel.	
70									
75			10	90	BG				204.9
								Log information taken form the boring for the Cockfield well at SWMU#7 site 8.	
80									

WELL DIAGRAM



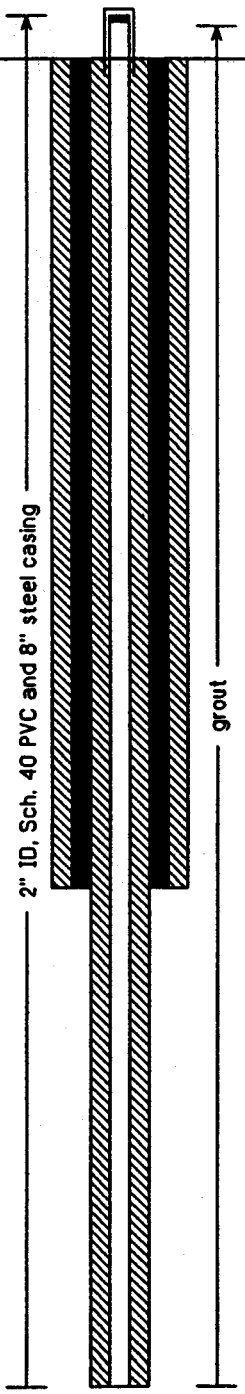
EnSafe/Allen & Hoshall

Monitoring Well 07MW08UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *280.86 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *283.15 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *26.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.15 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125 feet*
Geologist: *David Ladd*	Well Screen: *113.5 below grade to 123.5 below grade feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1		BG			Clayey silt, yellowish brown, mottled yellowish gray.	
			2		BG				
5				140	BG			Clayey silt, moderate brown, moist, soft.	
			3		BG				
			4		BG				
10		■	5	98	BG				
			6		BG				
			7		BG				
15				98					
			8		BG		ML		
			9		BG			Clayey silt, olive gray, medium stiff to soft.	
20			10		BG				
		■	11		BG			Silt, light olive gray with brown mottling.	
25				85				Silt, moderate to light brown, hard.	
			13		BG				
			14		BG				
30				80					
			15		BG			Sandy silt, moderate yellowish brown.	
			16		BG				247.9
							SC	Sand, fine, dark yellowish orange mottled with grayish orange, silty.	
35			17	120	BG				245.9
			18		BG		GP	Sand, pale yellowish brown.	
			19		BG				
40									

WELL DIAGRAM



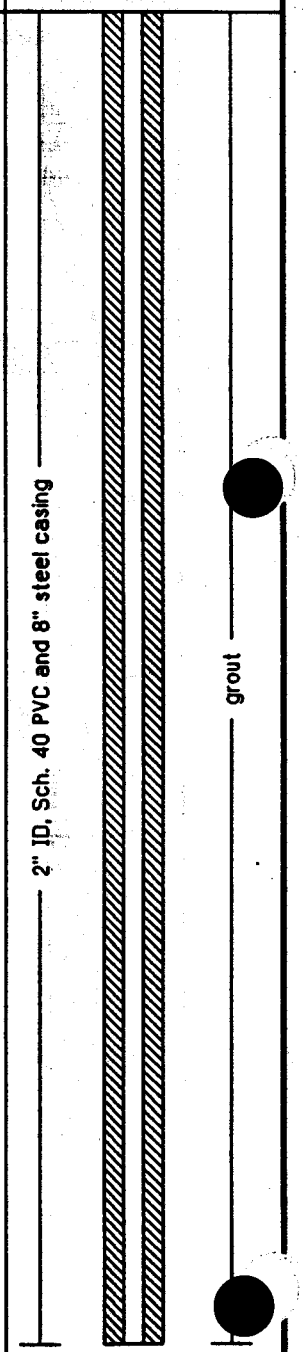
EnSafe/Allen & Hoshall

Monitoring Well 07MW08UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *280.86 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *283.15 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *26.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.15 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125 feet*
Geologist: *David Ladd*	Well Screen: *113.5 below grade to 123.5 below grade feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			20		BG				
			21		BG				
45			22	80	BG			Sand, fine, grayish orange to dark yellowish orange, wet, scattered gravel.	
			23		BG				
			24		BG				
50			25		BG				
			26		BG				
55			27	95	BG				
			28		BG				
			29		BG		GP		
60			30		BG				
			31		BG			Sand and gravel, fine to very coarse grained, grayish orange to dark yellowish orange, gravel.	
65			32	90	BG				
			33		BG				
			34		BG				
70			35		BG				
			36		BG				
75			37	90	BG				
			38		BG		SC	Sand, silty, very fine grained, dark yellowish orange mottled with light gray, wet.	204.9
			39		BG				
80									

WELL DIAGRAM



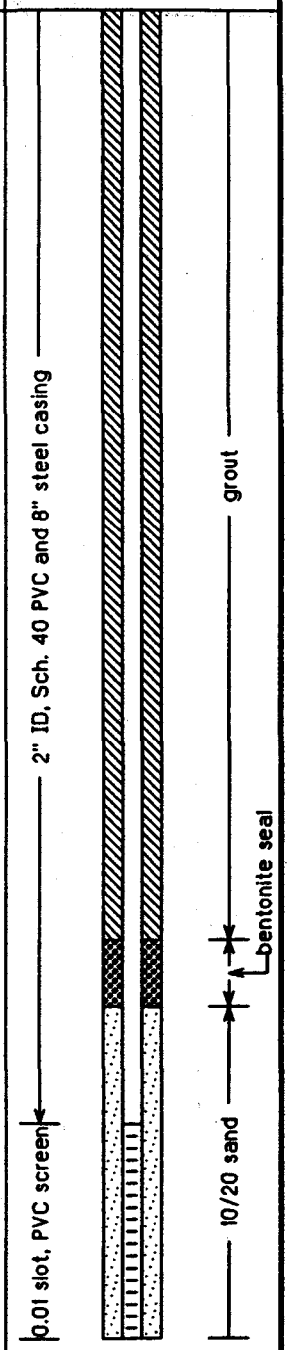
EnSafe/Allen & Hoshall

Monitoring Well 07MW08UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *280.86 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *283.15 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *26.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.15 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125 feet*
Geologist: *David Ladd*	Well Screen: *113.5 below grade to 123.5 below grade feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			40		BG				
			41		BG			Sand, silty, very fine grained, dark yellowish orange to very pale orange.	
85			42	85	BG				
			43		BG			Sand, silty, very fine grained, dark yellowish orange mottled with light gray, interbedded with gray clay, wet from 94'-95'.	
			44		BG				
90			45		BG				
			46		BG				
95			47	100	BG			Sand with interbedded clay, very fine, dusky brown to moderate brown, mottled with light olive gray, rare marcasite nodules.	
			48		BG				
			49		BG				
100			50		BG		SC		
			51		BG				
105			52	110	BG				
			53		BG				
			54		BG				
110			55		BG				
			56		BG				
115			57	110	BG				
			58		BG				
			59		BG				
120									

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well 07MW08UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *280.86 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *283.15 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *26.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.15 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *125 feet*
Geologist: *David Ladd*	Well Screen: *113.5 below grade to 123.5 below grade feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
	X		60		BG		SC		158.9	10/20 sand
			61		BG		CL	Clay, laminations of sand, dusky yellowish brown to moderate brown clay, light olive to olive brown sand, waxy.		
125			62	105	BG			End of boring at 125'.	155.9	
130										
135										
140										
145										
150										
155										
160										

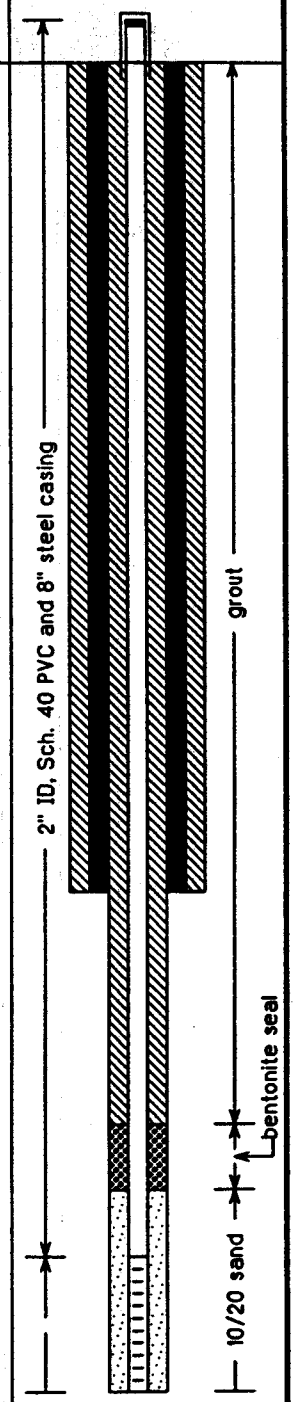
EnSafe/Allen & Hoshall

Monitoring Well 07MW08UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *281.03 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *282.94 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *25.69 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.25 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45 feet*
Geologist: *David Ladd*	Well Screen: *36.0 to 46.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, yellowish brown, mottled yellowish gray.	
5			1	140	BG			Clayey silt, moderate brown, moist, soft.	
10			2	98	BG				
15			3	98	BG		ML	Clayey silt, olive gray, medium stiff to soft.	
20								Silt, light olive gray with brown mottling.	
25			4	85	BG			Silt, moderate to light brown, hard.	
30			5	80	BG			Sandy silt, moderate yellowish brown.	
								Sand, fine, dark yellowish orange mottled with grayish orange, silty.	248
35			6	120	BG		GP	Sand, pale yellowish brown.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well 07MW08UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *281.03 feet msl*
Started at *0900 on 2-11-95*	TOC Elevation: *282.94 feet msl*
Completed at *1210 on 2-24-95*	Depth to Groundwater: *25.69 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.25 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *45 feet*
Geologist: *David Ladd*	Well Screen: *36.0 to 46.0 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45	X		7	80	BG		GP	Log information taken form the boring for the Cockfield well at SWMU#7 site 8.	235	10/20 sand
50										
55										
60										
65										
70										
75										
80										

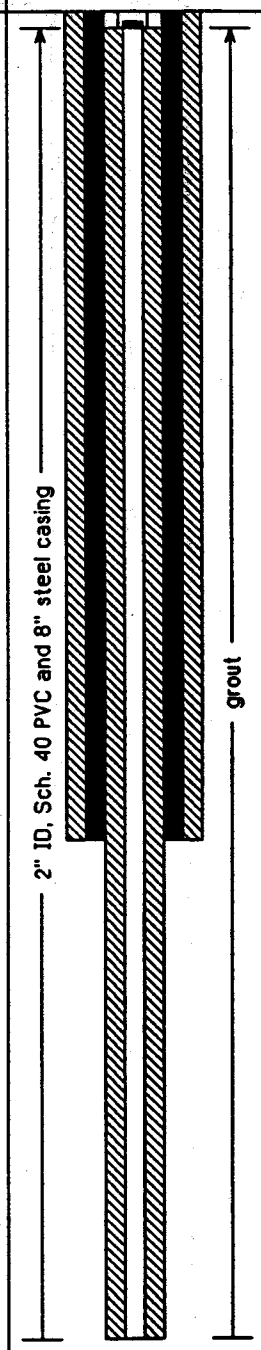
EnSafe/Allen & Hoshall

Monitoring Well 07MW09LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.65 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *25.47 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.42 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *77 feet*
Geologist: *Ben Brantley*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown with yellow gray streaks, moist, soft.	
5			1	100	BG				
10			2	70	BG				
15			3	100	BG		ML	Silty clay, reddish brown, stiff and plastic.	
20								Clayey silt, light brown with clay inclusions.	
25			4	95	BG			Silty clay, moderate brown to reddish brown.	
30									
									250.4
35			5	80	BG		GP	Sand, fine, yellow orange to light brown.	
40								Sand, medium, yellowish gray, micaceous.	

WELL DIAGRAM



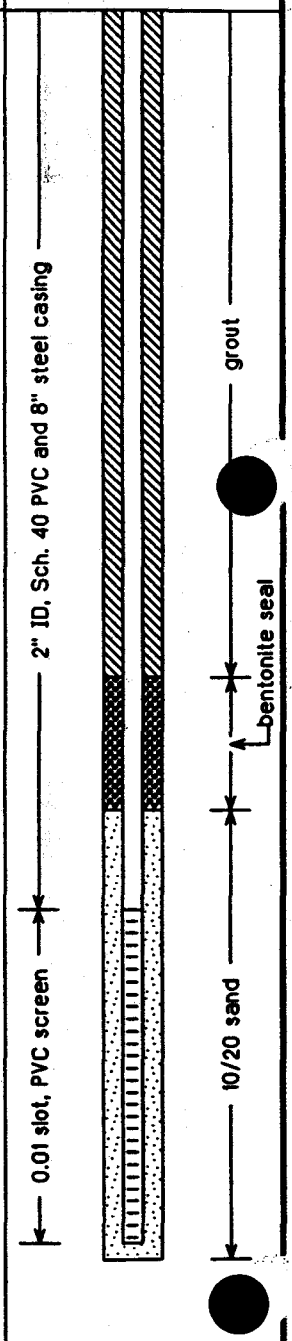
EnSafe/Allen & Hoshall

Monitoring Well 07MW09LF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.65 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *25.47 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.42 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *77 feet*
Geologist: *Ben Brantley*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			6	95	BG				
50									
55							GP		
60								Sand, Coarse to gravelly, grayish orange to yellowish orange.	
65			7	90	BG				
70									
									209.9
75							SC	Silty sand, very fine, yellowish orange banded with yellowish gray.	
									205.9
								Log information taken from the boring for the Cockfield well at SWMU#7 site 9.	
80									

WELL DIAGRAM



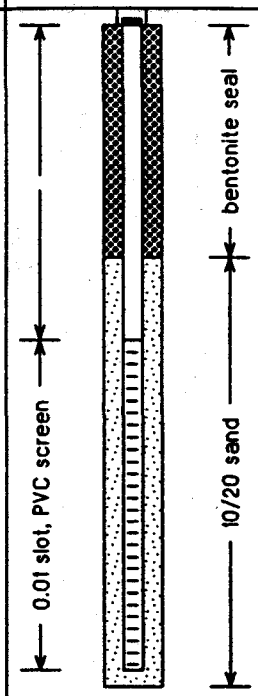
EnSafe/Allen & Hoshall

Monitoring Well 07MW09LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.54 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *13.30 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *269.24 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.5 feet*
Geologist: *Ben Brantley*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown with yellow gray streaks, moist, soft.	
5			1	100	BG				
10			2	70	BG		ML		
15			3	100	BG			Silty clay, reddish brown, stiff and plastic.	
20								Clayey silt, light brown with clay inclusions.	262.4
								Log information taken from the boring for the Cockfield well at SWMU#7 site 9.	
25			4	95	BG				
30									
35									
40									

WELL DIAGRAM



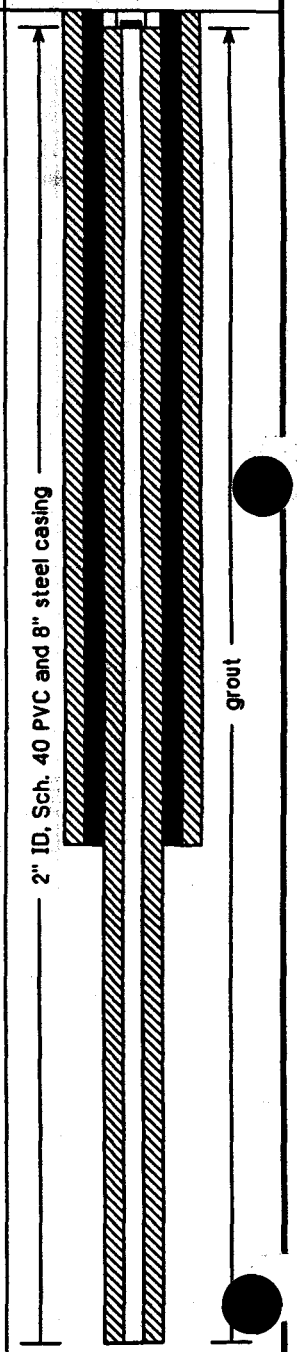
EnSafe/Allen & Hoshall

Monitoring Well 07MW09UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.47 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *26.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *115 feet*
Geologist: *Ben Brantley*	Well Screen: *102 to 112 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1		BG			Clayey silt, moderate brown with yellow gray streaks, moist, soft.	
5			2	100	BG				
			3		BG				
			4		BG				
10				70					
			5		BG				
			6		BG				
15			7	100	BG				
			8		BG		ML	Silty clay, reddish brown, stiff and plastic.	
			9		BG				
20			10		BG			Clayey silt, light brown with clay inclusions.	
			11		BG				
								Silty clay, moderate brown to reddish brown.	
25			12	95	BG				
			13		BG				
			14		BG				
30			15		BG				
			16		BG			Sand, fine, yellow orange to light brown.	250.4
35			17	80	BG		GP		
			18		BG				
			19		BG			Sand, medium, yellowish gray, micaceous.	
40									

WELL DIAGRAM



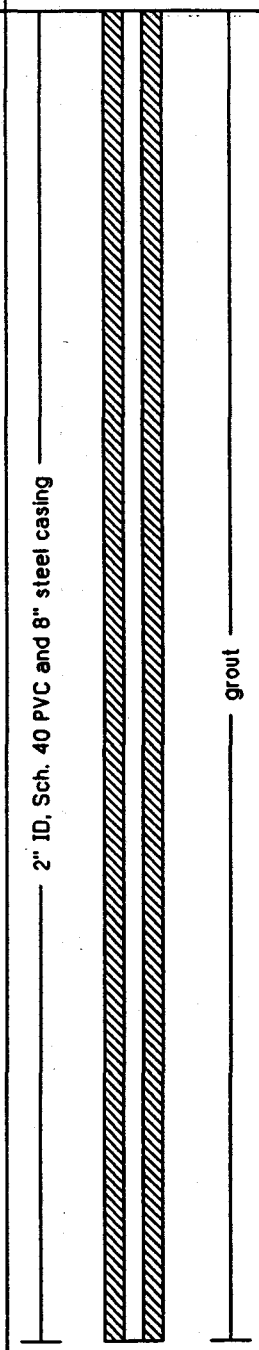
EnSafe/Allen & Hoshall

Monitoring Well 07MW09UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.47 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *26.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *115 feet*
Geologist: *Ben Brantley*	Well Screen: *102 to 112 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			20		BG				
			21		BG				
45			22	95	BG				
			23		BG				
			24		BG				
50			25		BG				
			26		BG				
55			27		BG				
			28		BG		GP		
			29		BG				
60			30		BG			Sand, Coarse to gravelly, grayish orange to yellowish orange.	
			31		BG				
65			32	90	BG				
			33		BG				
			34		BG				
70			35		BG				
			36		BG				209.9
75			37		BG			Silty sand, very fine, yellowish orange banded with yellowish gray.	
			38		BG		SC		
			39		BG			Clayey silty sand, grayish brown, dusky brown layers of clay with light gray sand.	
80									

WELL DIAGRAM



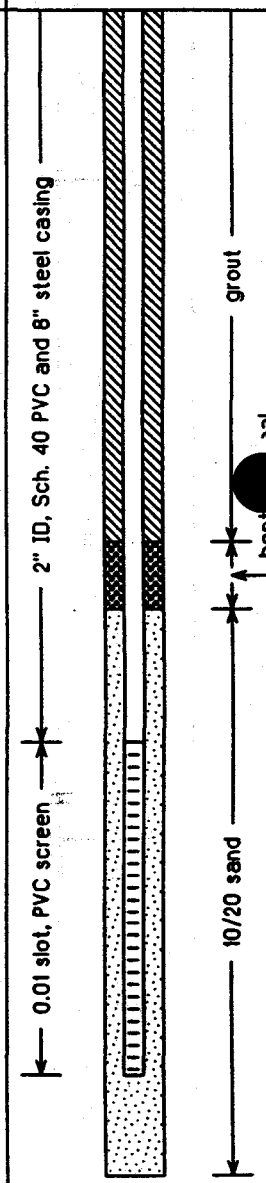
EnSafe/Allen & Hoshall

Monitoring Well 07MW09UC

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.47 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *26.38 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *256.09 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *115 feet*
Geologist: *Ben Brantley*	Well Screen: *102 to 112 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			40		BG				
			41		BG				
85			42	95	BG				
			43		BG				
			44		BG				
90			45		BG				
			46		BG				
95			47		BG				
			48		BG		SC		
			49		BG				
100			50		BG				
			51		BG				
105			52	90	BG				
			53		BG				
			54		BG				
110			55		BG				
			56		BG		CL	Clay, dusky brown, hard and waxy, with medium gray sand lenses.	170.9
115			57	110	BG			End of boring at 115'.	167.9
120									

WELL DIAGRAM



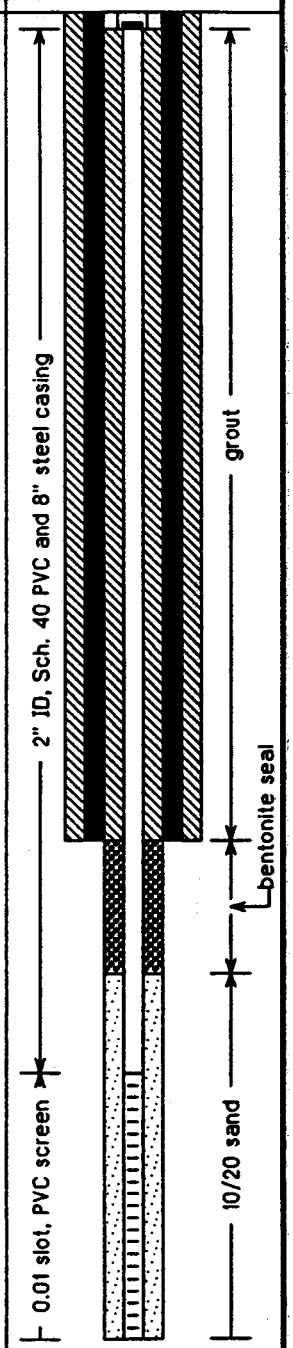
EnSafe/Allen & Hoshall

Monitoring Well 0~~8~~7MW09UF

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.89 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *25.11 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.78 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *42 feet*
Geologist: *Ben Brantley*	Well Screen: *32 to 42 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Clayey silt, moderate brown with yellow gray streaks, moist, soft.	
5			1	100	BG				
10			2	70	BG				
15			3	100	BG				
							ML	Silty clay, reddish brown, stiff and plastic.	
20								Clayey silt, light brown with clay inclusions.	
								Silty clay, moderate brown to reddish brown.	
25			4	95	BG				
30									
									250.4
								Sand, fine, yellow orange to light brown.	
35			5	80	BG		GP		
								Sand, medium, yellowish gray, micaceous.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 07MW09UF
Project: *NAS Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *N0094*	Surface Elevation: *282.89 feet msl*
Started at *1550 on 2-11-95*	TOC Elevation: *282.89 feet msl*
Completed at *on 2-25-95*	Depth to Groundwater: *25.11 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.78 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *42 feet*
Geologist: *Ben Brantley*	Well Screen: *32 to 42 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
	X						GP		240.9	
								Log information taken from the boring for the Cockfield well at SWMU#7 site 9.		
45			6	95	BG					
50										
55										
60										
65										
70										
75										
80										

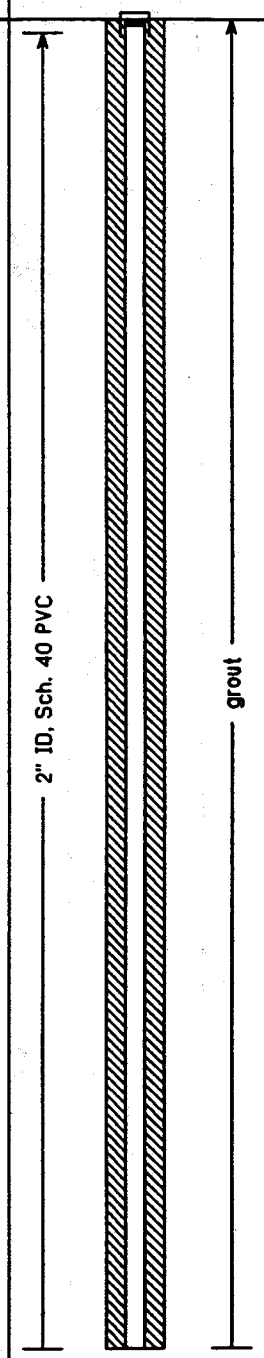
EnSafe/Allen & Hoshall

Monitoring Well 007G10LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *282.22 feet msl*
Started at *0745 on 3-18-96*	TOC Elevation: *282.01 feet msl*
Completed at *0930 on 3-18-96*	Depth to Groundwater: *33.47 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *248.54 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					.1			(0-10') Silt, brown, with some clay and some organic material.	
					.1				
5					.1		ML		
					.1				
			1	46	.1				
10									272.2
							ML CL	(10-12') Silt and clay, olive gray, more organic material.	
									270.2
								(12-28') Silt, yellowish-grown to yellowish-gray with dark yellowish- orange mottling, minor clay and organics.	
15									
20							ML		
25			2	75					
									254.2
								(28-48') Clay with some silt, brownish-gray.	
30								Silt and clay, light gray to light brown, with some dark yellowish- orange mottling, moist.	
							CL ML		
35								Silt with clay and a trace of sand, yellowish-brown to dark yellowish- gray, with organics from 37' to 38', moist.	
40									

WELL DIAGRAM



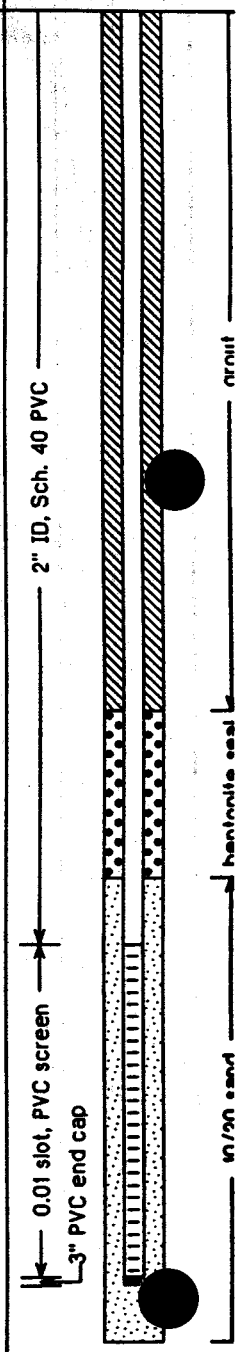
EnSafe/Allen & Hoshall

Monitoring Well 007G10LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *282.22 feet msl*
Started at *0745 on 3-18-96*	TOC Elevation: *282.01 feet msl*
Completed at *0930 on 3-18-96*	Depth to Groundwater: *33.47 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *248.54 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			3	110			CL ML	Silt with some clay and some sand. Orangish-gray with some dark yellowish-orange mottling. Contact with Fluvial Deposits (41-78') estimated at 41'.	
45			4	100					
							SP SC	(48-52') Sand and sandy clay, dark yellowish-orange and orangish-gray.	234.2
50									230.2
							SC GW	(52-56') Sand and gravel, some clay in matrix, reddish-brown with iron staining.	
55									226.2
			5	111				(56-78') Sand and gravel, yellowish-brown to dusky yellow, with gravel (up to 2" in longest dimension).	
60									
65							SW GW	Color change to dark yellowish-orange to reddish-brown.	
70									
75			6	115					
							SP	(78-86') Cockfield Formation (see descriptions below).	204.2
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well 007G10LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *282.22 feet msl*
Started at *0745 on 3-18-96*	TOC Elevation: *282.01 feet msl*
Completed at *0930 on 3-18-96*	Depth to Groundwater: *33.47 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *248.54 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SP	(78-81') Fine sand, gray, with clay stringers.	201.2	10/20 sand
							CL	(81-86') Clay, brown, with fine sand interbeds.		
85									196.2	
								Soil boring terminated at 86'.		
90										
95										
100										
105										
110										
115										
120										

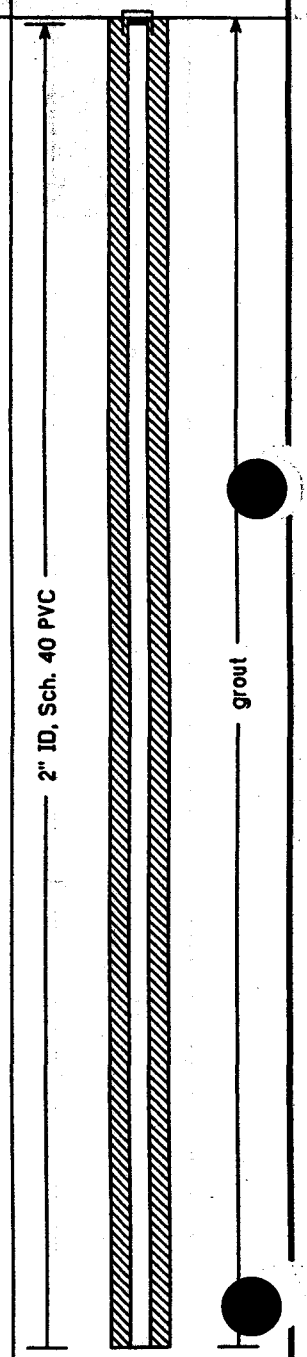
EnSafe/Allen & Hoshall

Monitoring Well 007G11LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *283.15 feet msl*
Started at *1200 on 3-18-96*	TOC Elevation: *282.94 feet msl*
Completed at *1500 on 3-18-96*	Depth to Groundwater: *30.76 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *252.18 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *60 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG			(0-36') Silt with some clay and organic material, brown with some dark yellowish-orange mottling.	
			1	83	BG				
5					BG				
					BG			Abundant organic material, yellowish-brown to light brown.	
					BG				
10			2	80				Moist at 12'.	
15									
							ML/CL	Silty, clayey greenish-gray to olive gray, moist to wet.	
20									
								Silty, clayey, with organic material, color change to brownish-gray.	
25			3	105					
30								Silty, clayey with organic material, yellowish-brown to yellowish- gray, only slightly moist.	
35									
									247.1
40							ML	(36-41') Silt, slightly clayey, yellowish-brown to yellowish- gray with some dark yellowish-orange staining, with organic material and iron concretions.	

WELL DIAGRAM



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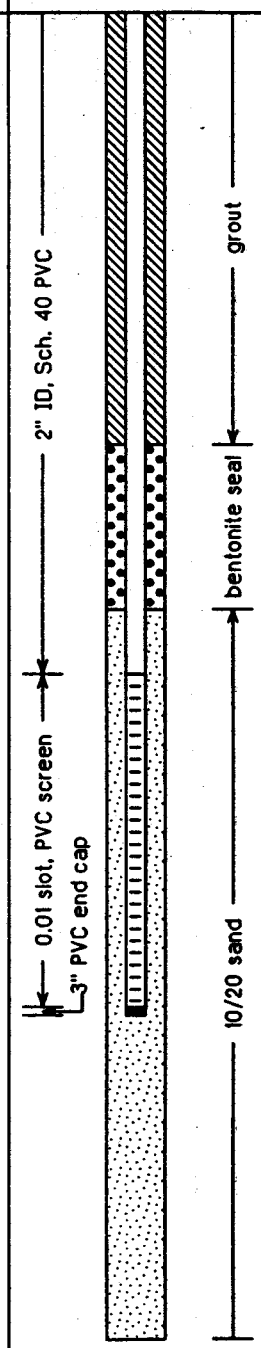
Monitoring Well 007G11LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *283.15 feet msl*
Started at *1200 on 3-18-96*	TOC Elevation: *282.94 feet msl*
Completed at *1500 on 3-18-96*	Depth to Groundwater: *30.76 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *252.18 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *60 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			4	120			ML		242.1
45							CL ML	(41-46') Clay and silt, dark yellowish-orange to orangish-gray, sandy, with a trace of small gravel. Contact with Fluvial Deposits (44-70') estimated at 44'.	237.1
50							SW SC	(46-51') Sand (fine to medium-grained) and clay lenses, orangish-gray to yellowish-gray.	232.1
55			5	110			SW GW	(51-70') Sand, coarse-grained to very coarse-grained, and gravel (up to 2" in longest dimension), yellowish-brown to dusky yellow.	
60									
65								Some minor clay in sand and gravel matrix from 66' to 70'.	
70								Cockfield Formation: clay, dark brown, with thin interbeds of fine- grained sand, appears reworked from 70' to 72'.	213.1
75			6	105			CL		
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 007G11LF
Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *283.15 feet msl*
Started at *1200 on 3-18-96*	TOC Elevation: *282.94 feet msl*
Completed at *1500 on 3-18-96*	Depth to Groundwater: *30.76 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *252.18 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *60 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
85	X						CL			10/20 sand
								Soil boring terminated at 86'.	197.1	
90										
95										
100										
105										
110										
115										
120										

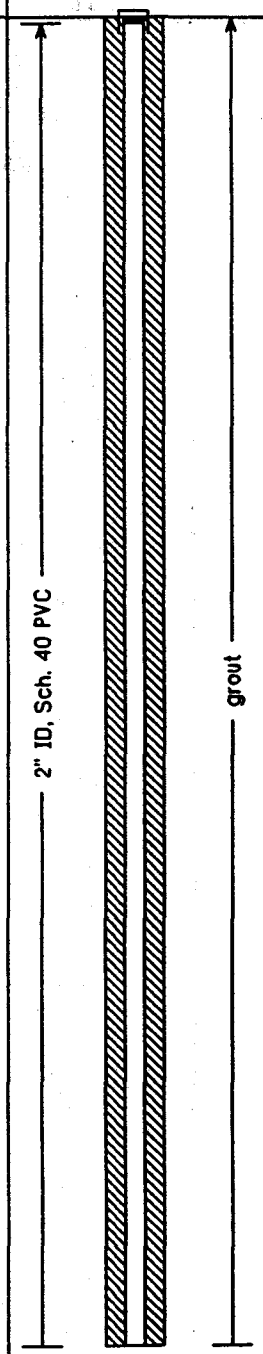
EnSafe/Allen & Hoshall

Monitoring Well 007G12LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *289.10 feet msl*
Started at *0800 on 3-16-96*	TOC Elevation: *288.78 feet msl*
Completed at *1240 on 3-16-96*	Depth to Groundwater: *35.68 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.10 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *96.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *80 to 90 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					.1			(0-2') Concrete.	
									287.1
			1		.1			(2-22') Silt, light brown to gray.	
5					.1				
					.1			Silt, light brown to yellowish-brown, with some organic material, moist.	
					.1				
10			2	70			ML		
15								(14-16') With dark yellowish-orange mottling.	
								Silt, yellowish-brown to yellowish-gray, wet.	
20			3	100					
									267.1
								Clay and silt, brown, with some iron concretions.	
25									
								Silt and clay, yellowish-brown to light brown, with some dark yellowish-orange mottling.	
30							CL ML		
			4	86					
35								Contact with Fluvial Deposits (34-90') estimated at 34'.	
									252.1
							SC SM	(37-43') Sand, clay, and silt, reddish-brown to dark yellowish-orange, moist.	
40									

WELL DIAGRAM



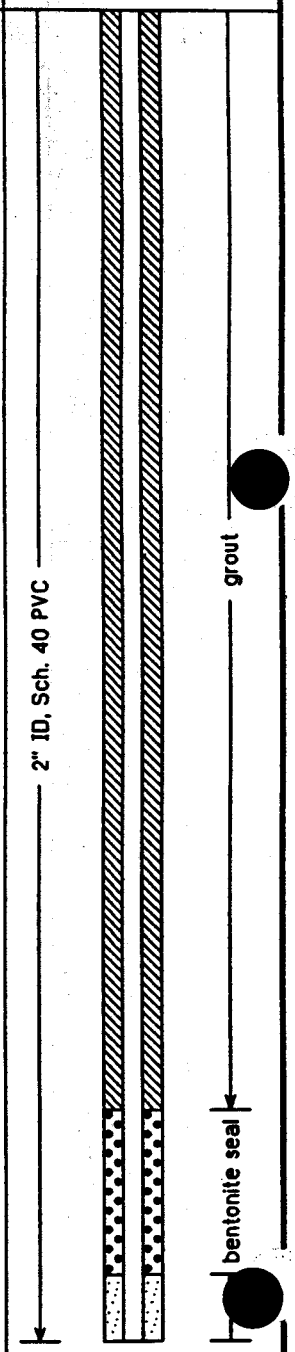
EnSafe/Allen & Hoshall

Monitoring Well 007G12LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *289.10 feet msl*
Started at *0800 on 3-16-96*	TOC Elevation: *288.78 feet msl*
Completed at *1240 on 3-16-96*	Depth to Groundwater: *35.68 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.10 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *96.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *80 to 90 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	100			SC SM		
							SW	(43-46') Sand, fine to medium-grained, reddish-brown, wet.	246.1
45									243.1
			6	92			SW SC	(46-51') Sand, dark yellowish-brown to yellowish-gray, with very light gray clay seams up to 4" thick.	
50									238.1
							SW	Sand, fine to medium-grained. Dark yellowish-orange, micaceous, wet.	
55									
								3" thick clay lens.	
60							CL	(60-60.5') Clay lens, light olive gray.	229.1 228.6
							SP	(60.5-63') Sand, medium-grained, grayish-brown, micaceous.	226.1
65			7	110			SW	Sand, fine to coarse-grained, moderate yellowish brown to dusky yellow, with minor pea-size gravel.	
70								With some clay lenses from 69' to 70'.	
								Sand, fine to very coarse-grained, yellowish-gray, micaceous.	
75									
80									

WELL DIAGRAM



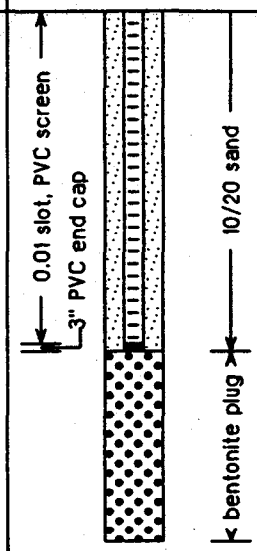
EnSafe/Allen & Hoshall

Monitoring Well 007G12LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *289.10 feet msl*
Started at *0800 on 3-16-96*	TOC Elevation: *288.78 feet msl*
Completed at *1240 on 3-16-96*	Depth to Groundwater: *35.68 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *253.10 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *96.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *80 to 90 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			8	120			SW		208.1
							SC	(81-82.5') Sand, fine to coarse-grained, dark yellowish-orange with clay lenses between 82' and 82.5', orangish-gray.	206.6
85							SW		203.1
							SC GC	(86-90') Sand and gravel with some clay in matrix, dark yellowish- orange.	199.1
90			9	110			CL	Cockfield Formation: Clay, dark brown, with thin interbeds of fine- grained sand.	193.1
95								Soil boring terminated at 96'.	
100									
105									
110									
115									
120									

WELL DIAGRAM



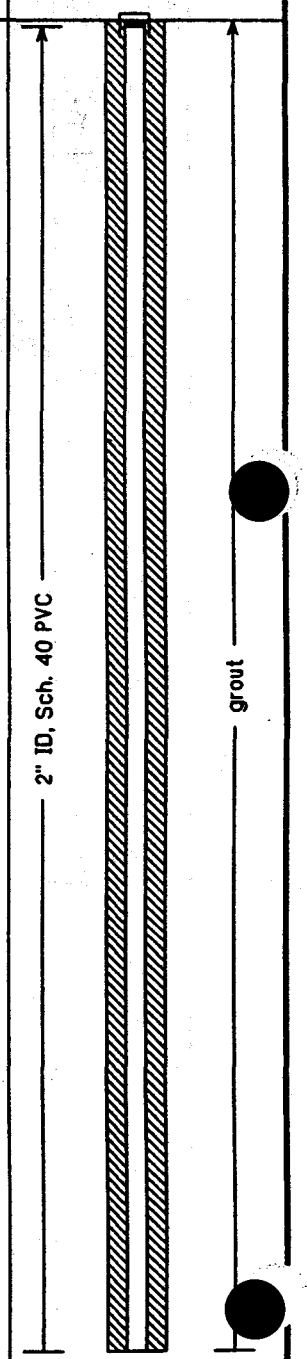
EnSafe/Allen & Hoshall

Monitoring Well 007G13LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.14 feet msl*
Started at *1430 on 3-17-96*	TOC Elevation: *292.96 feet msl*
Completed at *1600 on 3-17-96*	Depth to Groundwater: *34.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.05 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *66 to 76 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	.3			Silt, brown, with some gravel; fill 0' to 2', native material 2' to 4.	
					.3				
5					.3			(4-15') Silt, light brown to reddish-brown, with some clay and organic material.	
					.3				
					.3				
10			2	50					
15							ML	(15-16') Silt, with some clay, moderate gray.	
								(16-30') Silt, yellowish-brown and olive gray, with some clay, with some organic material and clay throughout, wet.	
20									
25			3	70					
30									263.1
								(30-34') Silt and clay, greenish-gray to olive gray, moist to wet.	
35							CL ML	(34-36') Increasing clay content.	
			4	150					255.1
40							ML CL	(38-44') Clay, silty and sandy, with scattered gravel, gray to light brown.	

WELL DIAGRAM



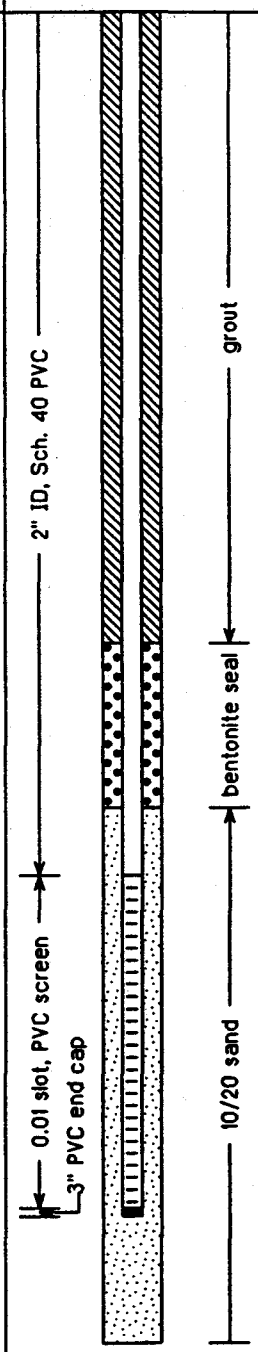
EnSafe/Allen & Hoshall

Monitoring Well 007G13LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.14 feet msl*
Started at *1430 on 3-17-96*	TOC Elevation: *292.96 feet msl*
Completed at *1600 on 3-17-96*	Depth to Groundwater: *34.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.05 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *66 to 76 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML CL	Color change to very light gray. Contact with Fluvial Deposits (43-78') estimated at 43'.	249.1
45			5	100			SP SC	Sand and clayey sand, very light gray to very light brown. Sand and sandy clay, very light gray, micaceous.	
50									
55			6	117				Sand, very light gray to light brown, with a few lenses of clay and sandy clay, micaceous. (59-60') With some gravel (3" thick lense).	
60							SW	(60-64') Sand, fine to medium-grained, light yellowish-brown to yellowish-gray, micaceous.	233.1
							SC	(64-65') With some clay (interstitial).	229.1 / 228.1
65							SW	(65-70') Sand, fine to medium-grained, light yellowish-brown to yellowish-gray, micaceous.	
70							CL	(70-71') Clay, very light gray.	223.1 / 222.1
							SP SC	(71-75') Sand, dark yellowish-orange to yellowish-brown, and clay, very light yellowish gray.	
75			7	115			SP GP	(75-76') Sand and gravel, sand is very coarse-grained, dark yellowish- orange.	218.1 / 217.1
							CL	(76-77') Clay.	216.1
							GC		215.1
							CL	(77-78') Clayey gravel.	
80									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 007G13LF
Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.14 feet msl*
Started at *1430 on 3-17-96*	TOC Elevation: *292.96 feet msl*
Completed at *1600 on 3-17-96*	Depth to Groundwater: *34.91 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.05 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *J.Kingsbury*	Well Screen: *66 to 76 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							CL	(78-86') Cockfield Formation (see descriptions below).		
								(78-79') Clay and sandy clay, grayish-orange.	211.1	
							SC	(79-79.5') Dark brown, moderate brown to 80'.		
85								(82-86') Sand, fine to medium-grained, light olive gray to light yellowish-brown, with clay stringers, light gray to grayish-orange.	207.1	10/20 sand
								Terminated soil boring at 86'.		
90										
95										
100										
105										
110										
115										
120										

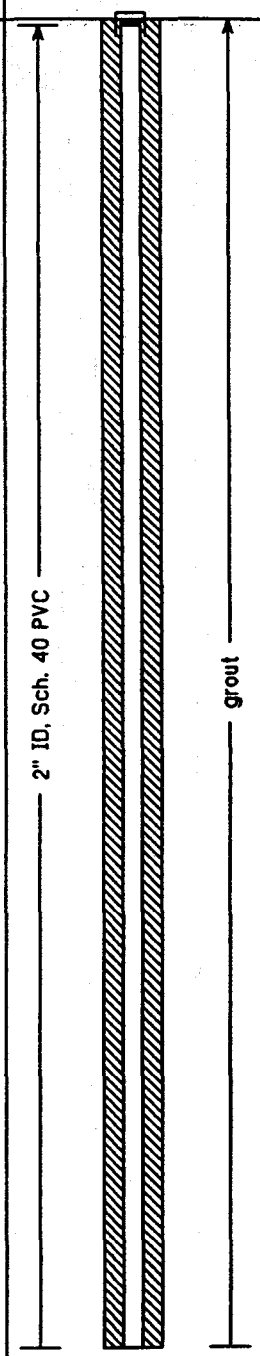
EnSafe/Allen & Hoshall

Monitoring Well 007G14LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *296.65 feet msl*
Started at *1330 on 3-16-96*	TOC Elevation: *296.43 feet msl*
Completed at *1700 on 3-16-96*	Depth to Groundwater: *37.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.44 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *126.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *84 to 94 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					.3			(0'-2) Concrete	
									294.6
					.3			(2'-21') Silt, brown, with some clay	
5					.3				
					.3				
			1	71	.3				
10							ML	Moist at 10'	
15									
20									
									275.6
								(21'-30') Brown clay with some sand and silt. Sand is fine-grained and dark yellowish-orange.	
25			2	85			CL ML		
30									268.6
							ML	(30'-34') Silt with fine sand and minor clay, very light gray with some dark yellowish-orange mottling, dry	
									262.6
35							SW SC	(34'-94') Fluvial Deposits (see descriptions below).	
									260.6
							CL	(34'-36') Fine to medium-grained sand, dark yellowish-orange to reddish-brown color, some clay present.	
			3	100					258.6
							SW	(36'-38') Clay, light brown.	
40									

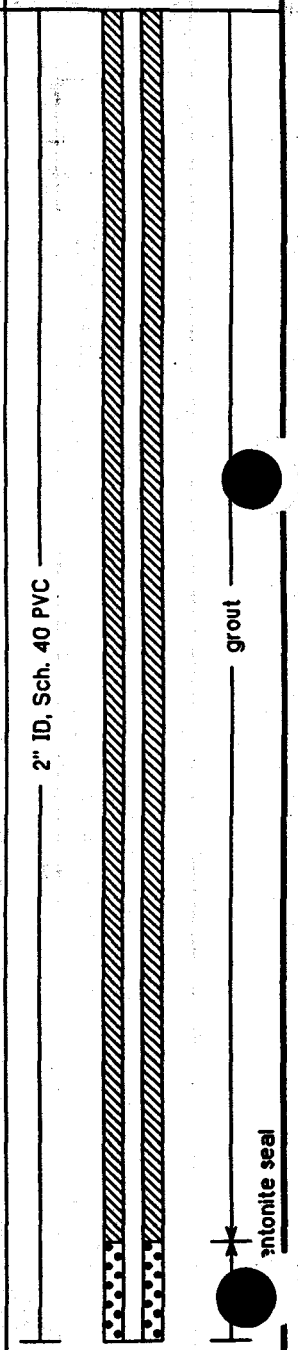
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 007G14LF
Project: NSA Memphis	Location: Millington, TN. SWMU 7 - Building N-126
Project No.: 0094-08420	Surface Elevation: 296.65 feet msl
Started at 1330 on 3-16-96	TOC Elevation: 296.43 feet msl
Completed at 1700 on 3-16-96	Depth to Groundwater: 37.99 feet Measured: 4/8/96
Drilling Method: Rotasonic	Groundwater Elevation: 258.44 feet msl
Drilling Company: Alliance Environmental	Total Depth: 126.0 feet
Geologist: J. Kingsbury	Well Screen: 84 to 94 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(38'-71') Sand (see descriptions below).	
								(38'-43') Sand, fine to medium-grained, dark yellowish-orange. Micaceous and wet at 40'	
45								(43'-45') Sand, fine to medium-grained, brownish-gray to medium gray, micaceous.	
								(45'-48') Clay seam.	
50								(48'-54') Sand, fine to medium-grained, yellowish-gray and micaceous, with some minor clay.	
			4	88					
55							SW	(54'-63') Sand, medium to very coarse-grained, dusky yellow, and minor gravel.	
60									
65								(63'-66') Sand, fine to medium-grained, yellowish-gray to very light gray, with minor clay.	
								(66'-71') Sand, fine to very coarse-grained, yellowish-gray to dark yellowish-orange, with minor gravel.	
70									225.6
75			5				SW CL	(71'-84') Sand, sandy clay, and clay; alternating beds of sand and clay .5' to 1.0 feet thick; sand is fine to medium-grained, dark yellowish-orange to moderate yellowish-brown, clay is very light gray to yellowish-gray.	
80									

WELL DIAGRAM



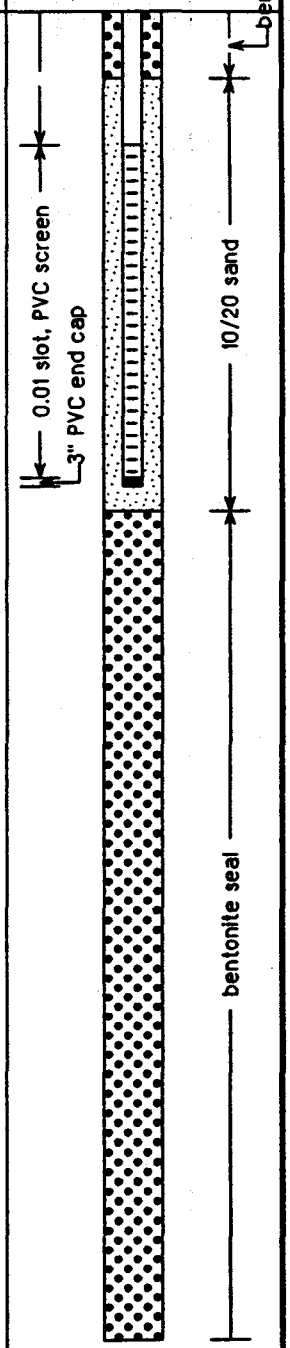
EnSafe/Allen & Hoshall

Monitoring Well 007G14LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *296.65 feet msl*
Started at *1330 on 3-16-96*	TOC Elevation: *296.43 feet msl*
Completed at *1700 on 3-16-96*	Depth to Groundwater: *37.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.44 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *126.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *84 to 94 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW CL		
							SW	(84'-86') Sand, fine to coarse-grained, dusky yellow to dark yellowish-orange.	212.6
85									210.6
90			6	100			SW GW	(86'-94') Sand, fine to very coarse-grained, dusky yellow to yellowish-brown and gravel (up to 1.5" in longest dimension).	202.6
95							SW	(94-126') Cockfield Formation (see descriptions below). Fine to medium-grained sand, yellowish-brown to very light gray color, with a small amount of gravel near 96'.	
100			7	95				(96'-104') Sand, fine to medium-grained, medium yellowish-gray to dark yellowish-orange.	
105								With a few thin stringers of clay at 104'	
110			8	120				(106'-116') Sand, fine to medium-grained, yellowish-brown to yellowish-gray, with some dark yellowish-orange mottling, a few clay stringers throughout, and some sparse scattered gravel (up to 1" in longest dimension).	
115									180.6
120							SC	(116'-126') Sand, fine to medium-grained, grayish-orange to dark, yellowish-orange with streaks of clay throughout	

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 007G14LF
Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *296.65 feet msl*
Started at *1330 on 3-16-96*	TOC Elevation: *296.43 feet msl*
Completed at *1700 on 3-16-96*	Depth to Groundwater: *37.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.44 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *126.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *84 to 94 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
	X		9	120			SC			bentonite seal
125									170.6	
								Soil boring terminated at 126'.		
130										
135										
140										
145										
150										
155										
160										

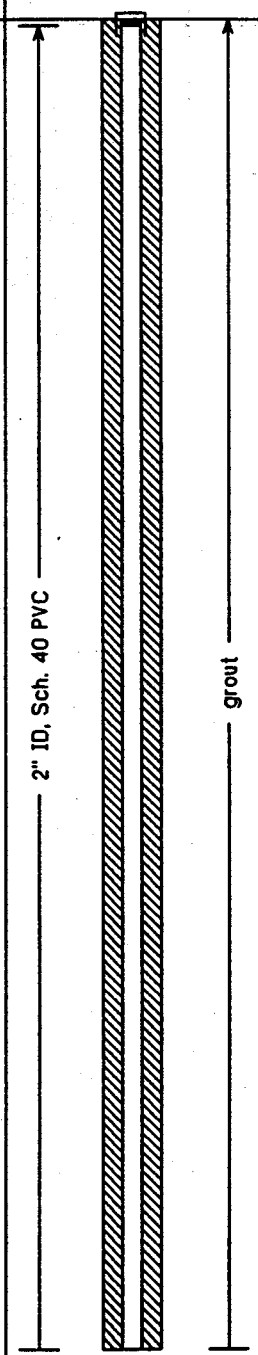
EnSafe/Allen & Hoshall

Monitoring Well 007G15LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.66 feet msl*
Started at *1315 on 3-19-96*	TOC Elevation: *293.36 feet msl*
Completed at *1530 on 3-19-96*	Depth to Groundwater: *35.65 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.71 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *106 feet*
Geologist: *J.Kingsbury*	Well Screen: *90 to 100 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					0			(0'-1') Concrete.	292.7
			1	83	0		CL ML	(1'-6') Silt and clay, brown to yellowish-brown.	
5					0				287.7
					0			(6'-35') Silt, see descriptions below.	
					0			(6'-10') Silt, brown to brownish-gray, some clay, hard.	
10								(10'-26') Silt, brown to dark yellowish-brown, with some clay, with organic material from 10' to 11', moist.	
15			2	85					
20							ML		
25								(26'-29') Silt with minor clay, brown, moist.	
30								(29'-35') Silt, brown mottled with dark yellowish-orange, with organic material, some clay, hard, slightly moist.	
35			3	100			SC SM	(35'-40') Clayey and silty sand, light reddish-brown. Fluvial deposits contact estimated at 36' based on geophysical log interpretation.	258.7
40							SW SC		253.7

WELL DIAGRAM



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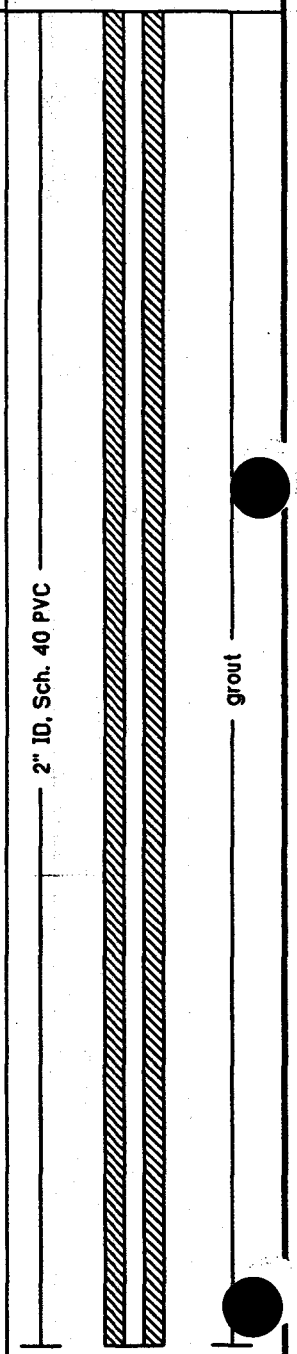
Monitoring Well 007G15LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.66 feet msl*
Started at *1315 on 3-19-96*	TOC Elevation: *293.36 feet msl*
Completed at *1530 on 3-19-96*	Depth to Groundwater: *35.65 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.71 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *106 feet*
Geologist: *J.Kingsbury*	Well Screen: *90 to 100 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW SC	(40'-46') Sand, fine to medium-grained, slightly clayey, dark yellowish-orange to light reddish-brown, with scattered gravel (up to 2" in longest dimension).	253.7
45									247.7
							SW	(46'-51') Sand, fine to medium-grained, orangish-gray to dark yellowish-orange, micaceous.	
50									242.7
							SW GW	(51'-66') Sand and minor gravel, dusky yellow to dark yellowish- orange with a few clay lenses less than 6" thick.	
55			4	110					
								(58'-61') Increasing gravel content.	
60									
65									227.7
							SW	(66'-94') Sand, fine to coarse-grained, orangish-gray to dark yellowish-orange, micaceous, with a trace of gravel.	
70									
75			5	105				Clay lens at 76'.	
								Clay lens at 78'.	
80									

WELL DIAGRAM



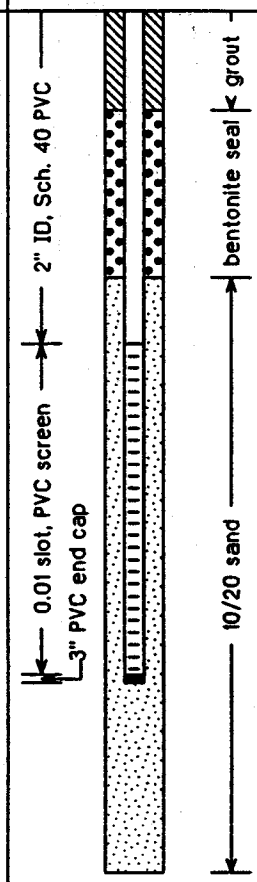
EnSafe/Allen & Hoshall

Monitoring Well 007G15LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.66 feet msl*
Started at *1315 on 3-19-96*	TOC Elevation: *293.36 feet msl*
Completed at *1530 on 3-19-96*	Depth to Groundwater: *35.65 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *257.71 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *106 feet*
Geologist: *J.Kingsbury*	Well Screen: *90 to 100 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85, 90							SW		
95			6	95			SW GW	(94'-100') Sand and gravel, dark yellowish-orange to dusky yellow; sand is fine to very coarse-grained, gravel is (up to 1.5" in longest dimension).	199.7
100							SP SC	Cockfield Formation: Sand, fine grained, with thin lenses of clay, yellowish-gray to light gray	193.7
105								Soil boring terminated at 106'.	187.7
110, 115, 120									

WELL DIAGRAM



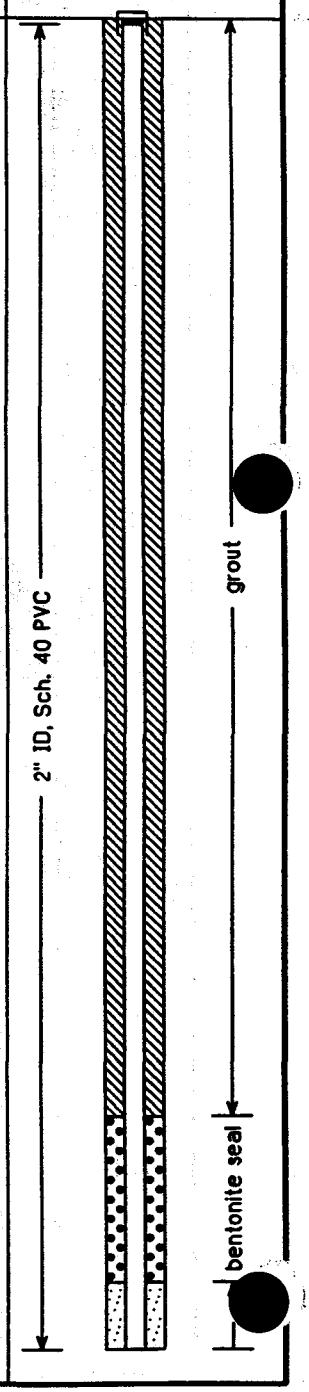
EnSafe/Allen & Hoshall

Monitoring Well 007G15UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.79 feet msl*
Started at *1600 on 3-19-96*	TOC Elevation: *292.91 feet msl*
Completed at *1730 on 3-19-96*	Depth to Groundwater: *34.54 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.37 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *50 feet*
Geologist: *J.Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0'-1') Concrete.	292.8
							CL ML	(1'-6') Silt and clay, brown to yellowish-brown.	
5									287.8
							ML	(6'-35') Silt (see descriptions below).	
								(6'-10') Silt, brown to brownish-gray, some clay, hard.	
10								(10'-26') Silt, brown to dark yellowish-brown, with some clay, with organic material from 10' to 11', moist.	
15									
20									
25								(26'-29') Silt with minor clay, brown, moist.	
30								(29'-35') Silt, brown mottled with dark yellowish-orange, with organic material, some clay, hard, slightly moist.	
35									258.8
							SC SM	(35'-40') Clayey and silty sand, light reddish-brown. Fluvial deposits contact estimated at 36' based on geophysical log interpretation.	
40							SW SC		253.8

WELL DIAGRAM



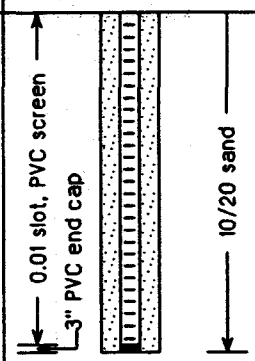
EnSafe/Allen & Hoshall

Monitoring Well 007G15UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *293.79 feet msl*
Started at *1600 on 3-19-96*	TOC Elevation: *292.91 feet msl*
Completed at *1730 on 3-19-96*	Depth to Groundwater: *34.54 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.37 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *50 feet*
Geologist: *J.Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW/SC	(40'-46') Sand, fine to medium-grained, slightly clayey, dark yellowish-orange to light reddish-brown, with scattered gravel (up to 2" in longest dimension).	253.0
45									247.8
							SW	(46'-50') Sand, fine to medium-grained, orangish-gray to dark yellowish-orange, micaceous.	
50								Terminated soil boring at 50'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 007G15LF.	243.8
55									
60									
65									
70									
75									
80									

WELL DIAGRAM



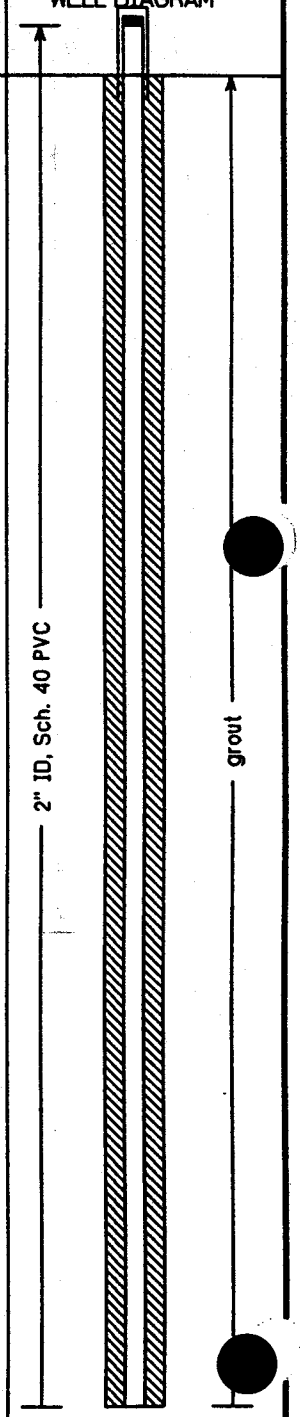
EnSafe/Allen & Hoshall

Monitoring Well 007G16LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *285.28 feet msl*
Started at *1318 on 3-15-96*	TOC Elevation: *287.63 feet msl*
Completed at *1500 on 3-15-96*	Depth to Groundwater: *29.29 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.34 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *D. Ladd*	Well Screen: *70 to 80 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	BG		OL	(0-2') Soil, grass, and roots.	
					BG				283.3
			2	200	BG			Silt, moderate yellowish-brown mottled with light olive gray and a small amount of dark yellowish-orange, contains iron/manganese nodules.	
					BG				
5					BG				
					BG			Silt, dark yellowish-brown mottled with a little light olive gray.	
					BG				
					BG			Clayey silt, moderate yellowish-brown mottled with a little light olive gray, contains iron/manganese nodules. Moist from 14' to 15', with an increasing amount of iron/manganese nodules with depth.	
					BG				
10			3	100	BG				
							ML		
15								Moist.	
								Clayey silt, dark yellowish-brown, becoming moderate yellowish-brown near 24.5', with iron-manganese nodules near 24.5, moist.	
20			4	80					
25								Silt, dark yellowish-orange mottled with moderate yellowish-brown and light olive gray, contains iron/manganese nodules.	
								Becoming sandy.	258.8
							SC	(26.5-31') Sand, fine-grained, dark yellowish-orange, locally clayey, wet. Contact with Fluvial Deposits (30-80') estimated at 30'.	
30									

WELL DIAGRAM



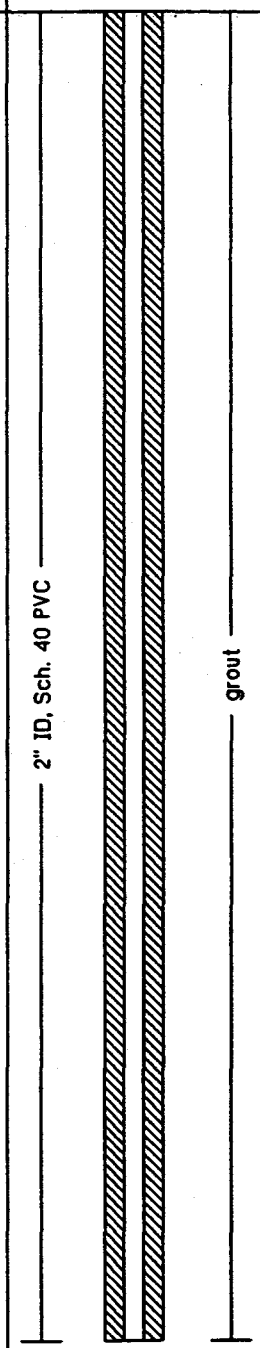
EnSafe/Allen & Hoshall

Monitoring Well 007G16LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *285.28 feet msl*
Started at *1318 on 3-15-96*	TOC Elevation: *287.63 feet msl*
Completed at *1500 on 3-15-96*	Depth to Groundwater: *29.29 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.34 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *D. Ladd*	Well Screen: *70 to 80 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	86			SC	(31-35') Clayey sand, fine-grained, dark yellowish-brown, wet.	250.3
35							SP	Sand, fine-grained, dark yellowish-brown, wet. Moderate yellowish-brown, micaceous, wet. Dark yellowish-brown. Moderate yellowish-brown to grayish-orange, mottled with sparse dark yellowish-brown. Shelby tube sample collected from 40' to 43' for geotechnical analysis, no sample collected for lithologic observation.	242.3
40			6	100					
							SC	(43-44') Clayey sand, fine-grained, light brown mottled with dark yellowish-orange, wet.	241.3
							SM	(44-45') Silty sand, fine-grained, light brown mottled with dark yellowish-orange and very light gray clayey sand, wet.	240.3
45							SP	(45-48') Sand, fine-grained, grayish-orange mottled with light brown, wet. Very light gray clay seam near 48'.	237.3
50			7	100			SW	(48-53') Sand, medium to very coarse-grained, with some gravel (up to 1" in longest dimension), yellowish-gray mottled with dark yellowish-orange and grayish-orange, micaceous, wet.	232.3
55							SC	(53-57') Clayey sand, fine-grained, yellowish-gray mottled with dark yellowish-orange, with ron-manganese nodules, wet, rare gravel piece at 53.5'. Clay seam near 55', yellowish-gray mottled with pale red.	228.3
60							SW	Sand, fine to very coarse-grained, with scattered gravel (up to 0.5" in longest dimension), olive gray to light olive gray, wet.	

WELL DIAGRAM



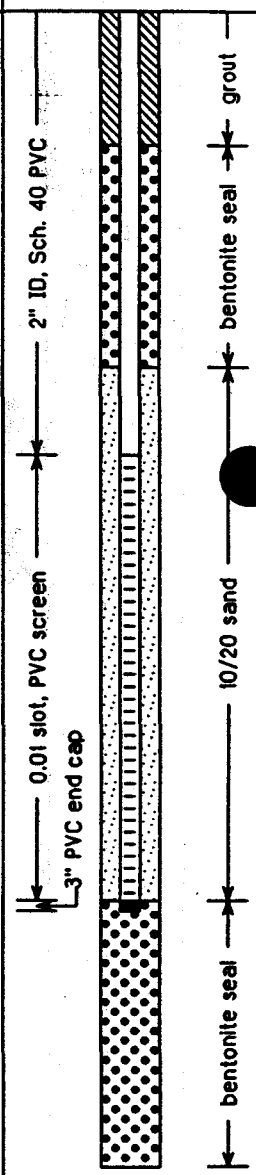
EnSafe/Allen & Hoshall

Monitoring Well 007G16LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *285.28 feet msl*
Started at *1318 on 3-15-96*	TOC Elevation: *287.63 feet msl*
Completed at *1500 on 3-15-96*	Depth to Groundwater: *29.29 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.34 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *D. Ladd*	Well Screen: *70 to 80 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
65			8	80			SW	Yellowish-gray to grayish-orange with scattered gravel.	
									219.3
70			9	80			SP GW	(66-77.5') Sand, very coarse-grained, and gravel; grayish-orange to dark yellowish-orange, wet. Gravel is mostly chert, increasing in size (up to 2" in longest dimension) and content near 76'.	
75									207.8
80			10	120			SW GW	(77.5-80') Gravel (up to 2" in longest dimension) and sand, fine to very coarse-grained, dark yellowish-orange, wet. Gravel content decreases and sand content increases near 80', the estimated contact between the Fluvial Deposits and the Cockfield Formation.	205.3
							SP		204.3
							SC	Cockfield Formation: Sand, very fine-grained, mostly lignitic, black micaceous, with a small amount of dark yellowish-brown and dark yellowish-orange clayey sand near 80'.	202.3
85							SP	(81-83') Clayey sand, very fine-grained, dark yellowish-brown.	199.8
							SC	(83-85.5') Sand, very fine-grained, light olive gray with lignitic streaks throughout, micaceous.	199.3
90								(85.5-86') Clayey sand, very fine-grained, dark yellowish-brown with lignitic streaks throughout, micaceous.	
								Terminated soil boring at 86'.	

WELL DIAGRAM



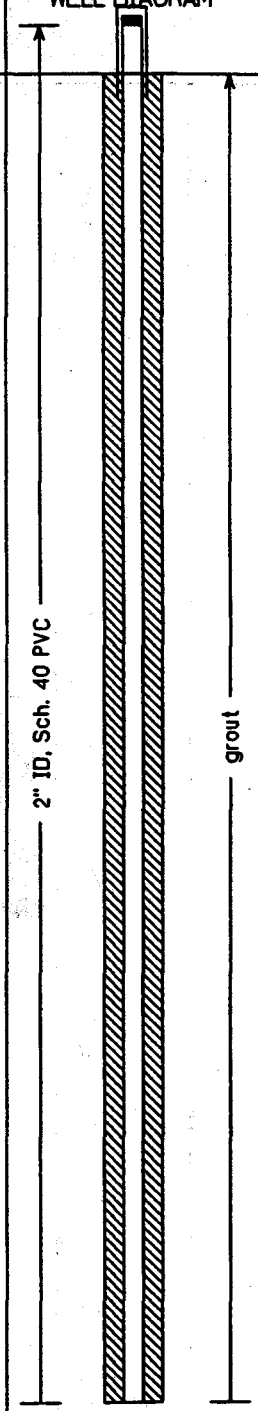
EnSafe/Allen & Hoshall

Monitoring Well 007G17LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *280.89 feet msl*
Started at *0750 on 3-15-96*	TOC Elevation: *283.20 feet msl*
Completed at *0956 on 3-15-96*	Depth to Groundwater: *25.19 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.01 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *D. Ladd*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X	◢	1	100	BG		OL	(0'-2') Soil, grass, and roots, brick fragments.	
					BG				278.9
					BG			(2'-34') Silt (see descriptions below).	
			2	120	BG			(2'-4') Moderate yellowish-brown mottled with dark yellowish-orange and olive gray.	
					BG				
5					BG			(4'-6') Olive gray.	
								(6'-16') Olive gray to medium bluish-gray, stained light olive brown in places, with iron/manganese nodules.	
					BG				
					BG				
					BG				
10					BG				
			3	40					
15							ML	(16'-22') Moderate yellowish-brown mottled with dark yellowish-orange and olive gray, with a few iron/manganese nodules.	
20			4	70					
								(22'-33') Very moist.	
25								(25'-29') Olive gray.	
								Scattered manganese nodules at 26'.	
30								(29'-34') Clayey and sandy, moderate yellowish-brown mottled with olive gray, moist.	

WELL DIAGRAM



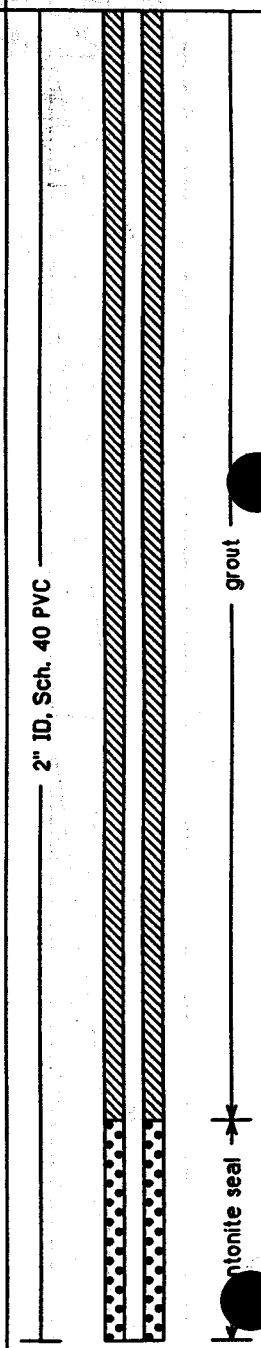
EnSafe/Allen & Hoshall

Monitoring Well 007G17LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *280.89 feet msl*
Started at *0750 on 3-15-96*	TOC Elevation: *283.20 feet msl*
Completed at *0956 on 3-15-96*	Depth to Groundwater: *25.19 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.01 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *D. Ladd*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	100			ML		
							SP CL	Contact with Fluvial Deposits (34-72') estimated at 34'.	246.9
35								(34'-36') Sand, very fine-grained, and silty clay, moderate yellowish-brown, moist.	244.9
							SC	Clayey sand, fine-grained, moderate reddish-brown to light brown, mottled with light olive gray and moderate yellowish-brown near 42', hard, contains rare iron concretions	
40			6	90					
								Clayey sand, fine-grained, very light gray mottled with moderate reddish-brown, light brown, moderate yellowish-brown, and grayish-orange, hard, with rare iron concretions	
45									235.4
							SP	(45.5'-58.5') Sand (see descriptions below).	
			7	100				Shelby Tube from 46-49'.	
50								Sand, fine-grained, dark yellowish-orange mottled with lt. brown from 51' to 53', becoming grayish-orange to dark yellowish-orange from 53' to 56'. Light gray clay seam at 51'. Thin gravel zone at 54'.	
			8	158					
55								(56'-58.5') Sand, fine-grained, grayish-orange, contains rare gravel pieces, wet.	
									222.4
							SW		
60									

WELL DIAGRAM



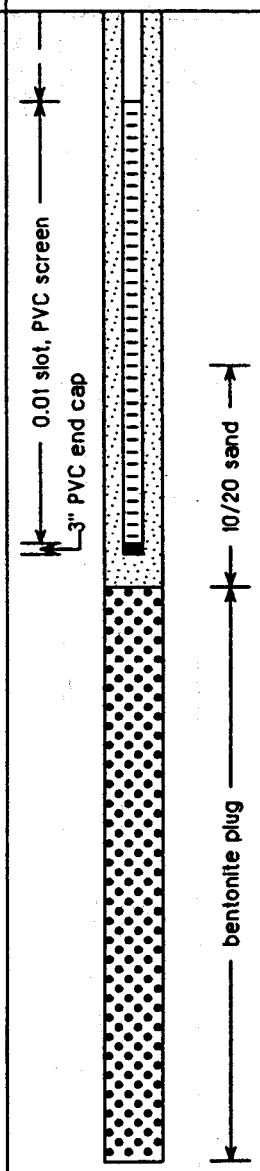
EnSafe/Allen & Hoshall

Monitoring Well 007G17LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *280.89 feet msl*
Started at *0750 on 3-15-96*	TOC Elevation: *283.20 feet msl*
Completed at *0956 on 3-15-96*	Depth to Groundwater: *25.19 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *258.01 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *86.0 feet*
Geologist: *D. Ladd*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			9	100			SW	(58.5'-64') Sand, fine to coarse-grained, grayish-orange mottled with dark yellowish-orange, with gravel (up to 0.5" in longest dimension), wet.	216.9
65							SW/GW	(64'-72') Sand (see descriptions below). Fine to very coarse-grained, and gravel (up to 1.5" in longest dimension), grayish-orange mottled with dark yellowish orange and very light gray clayey fine sand, wet. Some of the light gray material is cemented. Fine to very coarse-grained, and gravel (up to 2" in longest dimension), dark yellowish-orange mottled with very light gray clayey material, wet.	
70			10	100					208.9
75							SC	(72-86') Cockfield Formation (see descriptions below). Clayey sand, very fine-grained, dark yellowish-orange mottled with very light gray and grayish-orange, wet. Contains a small amount of gravel near 72'. (77'-78') Very wet, very light gray clay seam at 77'.	
80			11	120				Clayey sand, very fine-grained, dark yellowish-brown to dusky yellowish-brown, with some light olive gray, very fine sandy seams, moist from 83' to 84'.	196.9
85							CL	(84'-86') Sandy clay, dark yellowish-brown to dusky yellowish-brown mottled with light olive gray sandy seams, hard.	194.9
90								Terminated soil boring at 86.0'.	

WELL DIAGRAM



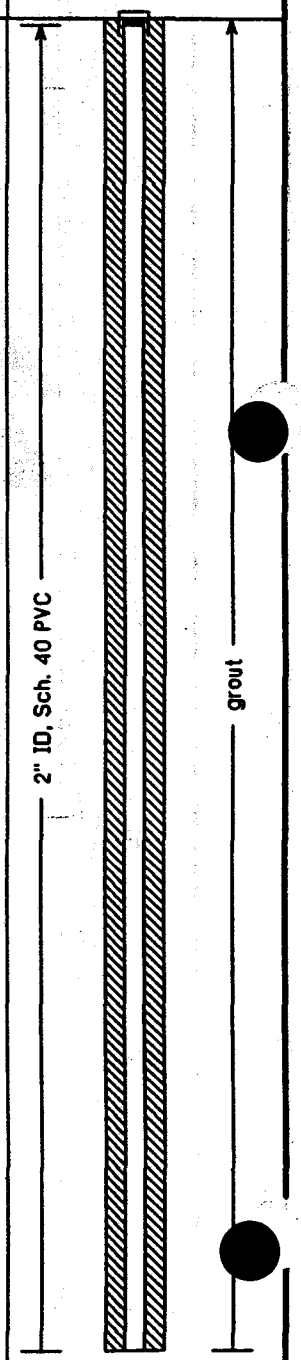
EnSafe/Allen & Hoshall

Monitoring Well 007G18LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *277.80 feet msl*
Started at *0745 on 3-19-96*	TOC Elevation: *277.58 feet msl*
Completed at *1000 on 3-19-96*	Depth to Groundwater: *23.50 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *254.08 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *116.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *90 to 100 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	BG			(0'-36') Silt, see descriptions below. (1'-2') Brown, with some clay.	
			2	67	BG			(2'-6') Brown, with some clay and organic material.	
5					BG			(6'-16') Brownish-gray to light brown with some dark yellowish-orange staining, with organic material to 16'.	
					BG				
					BG				
10			3	80					
15								(16'-19') Yellowish-brown, moist.	
							ML	(19'28') Olive gray to greenish-gray.	
20									
25			4	70					
								(28'-36') Yellowish-brown to yellowish-gray, with some clay.	
30									
35									241.8
40							CL ML	(36'-44') Clay and silt, with sandy zones and a few traces of gravel, orangish-gray to very light gray with some dark yellowish- orange staining. Fluvial deposits contact estimated at 43' based on geophysical log interpretation.	

WELL DIAGRAM



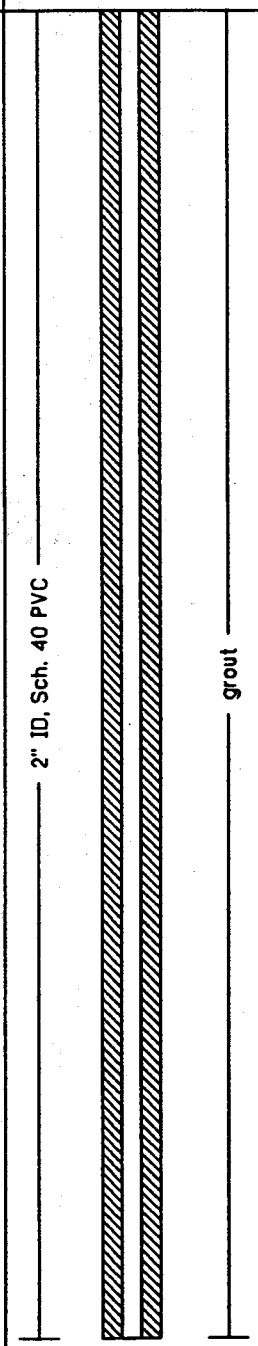
EnSafe/Allen & Hoshall

Monitoring Well 007G18LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *277.80 feet msl*
Started at *0745 on 3-19-96*	TOC Elevation: *277.58 feet msl*
Completed at *1000 on 3-19-96*	Depth to Groundwater: *23.50 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *254.08 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *116.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *90 to 100 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	120			CL ML		
							CL SP	(44'-46') Clay, sand, and gravel, very stiff and dense, dark yellowish-orange to orangish-gray.	233.8
45									231.8
50							SW	(46'-58') Sand, fine to coarse-grained, yellowish-gray to yellowish- brown, with a trace of gravel.	
55			6	90					
							SW GW	(58'-66') Sand and gravel, reddish-brown to dark yellowish-orange. Gravel is (up to 1.5" in longest dimension), some interstitial clay present.	219.8
60									
65									211.8
70							SW	(66'-72') Sand fine to very coarse-grained, dark yellowish-brown to light reddish-brown.	
							SC GW	(72'-79') Sand and gravel, brown to reddish-brown, gravel is (up to 2.5" in longest dimension), clayey from 72' to 79', iron cemented at 79'.	205.8
75			7	85					
80							SW GW	(79'-86') Sand and gravel, little or no clay, dark yellowish-orange to to reddish-brown.	198.8

WELL DIAGRAM



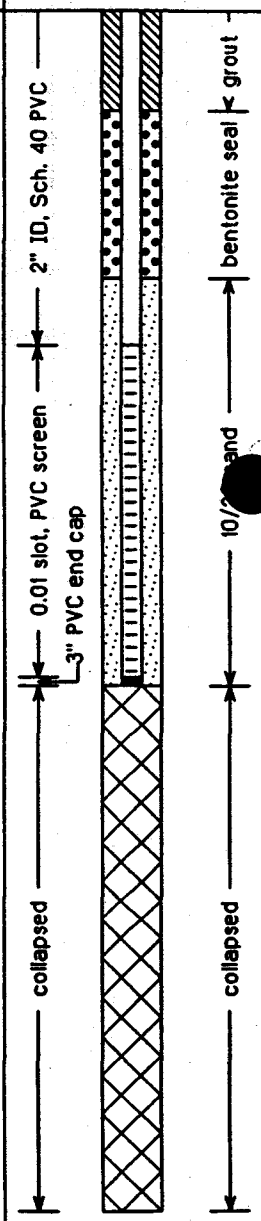
EnSafe/Allen & Hoshall

Monitoring Well 007G18LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *277.80 feet msl*
Started at *0745 on 3-19-96*	TOC Elevation: *277.58 feet msl*
Completed at *1000 on 3-19-96*	Depth to Groundwater: *23.50 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic*	Groundwater Elevation: *254.08 feet msl*
Drilling Company: *Alliance Environmental*	Total Depth: *116.0 feet*
Geologist: *J. Kingsbury*	Well Screen: *90 to 100 feet*

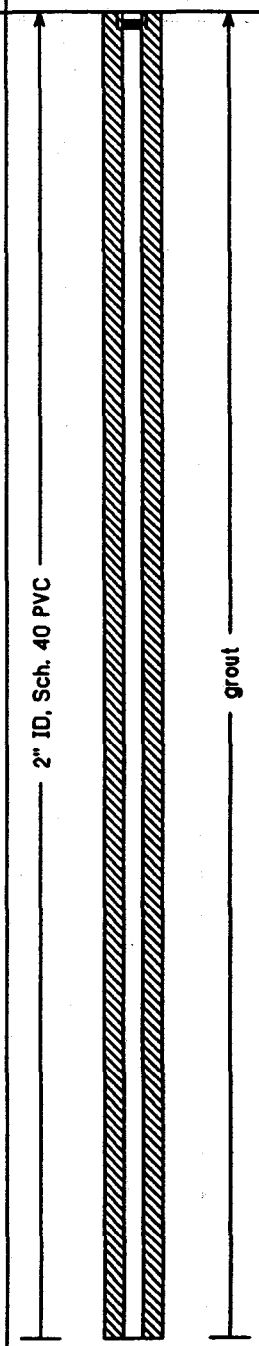
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85							SW/GW		
									191.8
90			8	120			GW	(86'-93') Gravel (up to 2.5" in longest dimension), with some sand, very slightly clayey, yellowish in color.	
									184.8
95							SW/GW	(93'-100') Sand and gravel, reddish-brown to dark yellowish-orange. Cobble approximately 4" diameter near 100'.	
100									177.8
105			9	110			SP	Cockfield Formation: Predominately fine-grained sand, gray, finely lignitic, with some thin stringers of clay throughout.	
110									
115									
									161.8
120								Soil boring terminated at 116'.	

WELL DIAGRAM



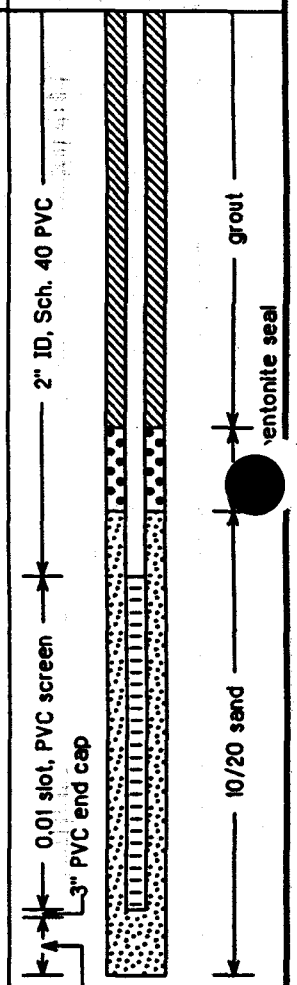
EnSafe/Allen & Hoshall	Monitoring Well 007G19LF Boring
Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 - Building N-126*
Project No.: *0094-08420*	Surface Elevation: *feet msl*
Started at *1130 on 3-13-97*	TOC Elevation: *feet msl*
Completed at *1140 on 3-14-97*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Hollow Stem Auger*	Groundwater Elevation: *feet msl*
Drilling Company: *Tristate Drilling*	Total Depth: *69.0 feet*
Geologist: *C. Ivey*	Well Screen: *57 to 67 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
5										
10										
15										
20										
25										
30										
35										
40										



EnSafe/Allen & Hoshall	Monitoring Well 007G19LF Boring
Project: *NSA Memphis*	Location: *Millington, TN. SWMU 7 – Building N-126*
Project No.: *0094-08420*	Surface Elevation: *feet msl*
Started at *1130 on 3-13-97*	TOC Elevation: *feet msl*
Completed at *1140 on 3-14-97*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Hollow Stem Auger*	Groundwater Elevation: *feet msl*
Drilling Company: *Tristate Drilling*	Total Depth: *69.0 feet*
Geologist: *C. Ivey*	Well Screen: *57 to 67 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45										
50										
55										
60										
65										
70										
75										
80										



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BORING LOG of 007G20LF

NSA MIDSOUTH
Millington, TN.

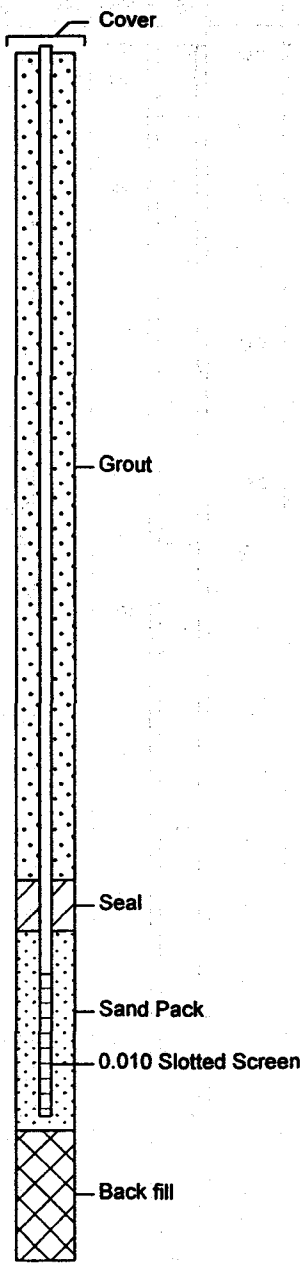
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1055 7/13/98	Northing	: 392485.90
Finished	: 1800 7/13/98	Easting	: 813486.00
Drilling Method	: Rotasonic	TOC Elevation	: 282.70
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: B. Brantley	Well Screen	: 65 to 75 feet

Geoprobe: 007G20LF
Elev.: 282.70

Depth in Feet	Surf. Elev. 282.82	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	282	1	60			ML	(0 - 1) Concrete, Asphalt mixed w/ sand (subgrade) (1 - 5) Dark yellowish brown mottled w/ med. Lt. gray clayey silt, dry, diesel odor (5 - 6) Med. brown to med. yellow brown silt, friable, hard (6 - 9) Olive gray clayey silt, moist (9 - 21) Med. yellowish brown mottled w/ Lt. gray silt, moist Lignite grains scattered throughout (21 - 25) Med. yellow brown w/ iron staining and Lt. olive gray mottles lenses silt, very moist (25 - 42.5) Pale yellow brown to Lt. olive gray clayey silt w/ iron stains, moist, med. stiff Slightly sandy (very fine) and iron-manganese partings between 36 and 41, (42.5) Lt. brown to med. brown clayey gravel sand mix w/ iron staining, very hard
5	277						
10	272	2	80				
15	267						
20	262	3	85				
25	257						
30	252	4	70				
35	247						
40	242	5	100				
45	237					SC	(42.5 - 47) Dark yellowish orange mottled w/ Lt. gray clayey very fine to fine sand w/ scattered pebbles (47 - 48) Med. gray clayey sand (48 - 52) Lt. brown to med yellow brown gravelly sand w/ clay, very stiff to hard, Gravels include both chert (up to 1/2") and Qtz. (up to 1")
50	232	6	100				
55	227					SW	(52 - 55) Grayish orange med. sand w/ scattered gravel (up to 3/4") (55 - 55.5) Chert gravel w/ coarse sand (55.5 - 65) Dark yellowish orange med. coarse sand w/ gravel, coarser sand w/ less fines between 63 and 65
60	222	7	80				
65	217					GW	(65 - 74) Med. yellow brown coarse to med grained sandy gravel (up to 3" dia.)
70	212	8	80				
75	207					SM	(74 - 75) Gravelly silt w/ fine sand (75 - 76) Dark yellowish orange clay with some gravel
80	202	9	110			SC	(76 - 77) Dark yellowish orange mottled w/ Lt. olive gray clay, some silt (77 - 85) Dusky brown to dusky yellow brown clay w/ some silty lenses, micaceous w/ some patches of very fine sand
85	197						
90							



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BORING LOG of 007G21LF

NSA MIDSOUTH
Millington, TN.

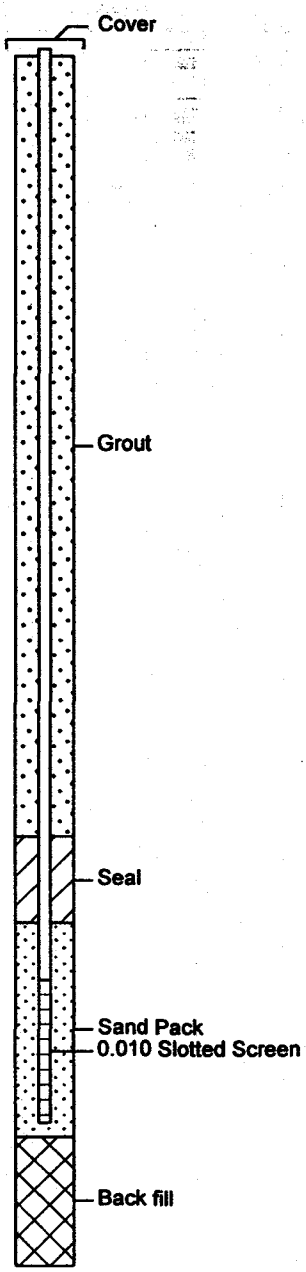
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0840 7/14/98	Northing	: 392560.30
Finished	: 1415 7/14/98	Easting	: 813673.00
Drilling Method	: Rotasonic	TOC Elevation	: 2283.66
Drilling Company	: Allinance Drilling	Total Depth	: 75 feet
Geologist	: B. Brantley	Well Screen	: 65 to 75 feet

Geoprobe: 007G21LF
Elev.: 283.66

Depth in Feet	Surf. Elev. 283.95	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	283	1	80				(0 -1) Concrete w/ sand gravel subgrade
5	278						(1 - 6) Med. to dark yellowbrown silt, dry, hard Greenish gray staining and diesel odor from 2.5 to 3
10	273	2	35				(6 - 8.5) Olive gray to med yellow brown clayey silt w/ manganese stains and streaks (8.5 - 15) No recovery
15	268						(15 - 28) Dark yellow orange streaked w/ med. yellow brown clayey silt, moist, med. stiff, manganese streaks scattered throughout
20	263	3	85			ML	(28 - 32) Pale yellow brown clayey silt w/ iron stains/streaks, moist, med. stiff (32 - 32.5) Olive gray clayey silt
25	258						
30	253	4	75				
							(32.5 - 35) No recovery
35	248						(35 - 37) Med. yellow brown silty clay w/ Lt. gray streaking, moist, med. stiff
40	243	5	100			CL	(37 - 41.5) Med. brown to med yellow brown sandy clay w/ Lt. gray streaks, med. stiff (41.5 - 47) Med. yellow brown and Lt. gray sandy clay Streaks of organic material between 41.5 and 42.5
45	238					SM	(47 - 48) Med. yellow brown and Lt. olive gray silty sand w/ scattered pebbles
50	233	6	90				(48 - 55) Dark yellowish orange med. to corase gravelly sand w/ Lt. gray streaks and iron staining, Gravel up to 1 1/2" dia.
55	228					SW	(55 - 61) Dark yellowish orange med. to coarse sandy gravel, wet
60	223	7	100				
						GM	(61 - 65) Med brown to dark yellow brown med. to coarse sand and silt w/ gravel (up to 3" dia.), wet
65	218						(65 - 70) No recovery
70	213	8	65			GM	(70 - 71) Gravel, chert, up to 2" dia., wet (71 - 74.5) Dark yellowish orange sandy gravel w/ pale yellowish orange seam at 74, wet
75	208					CL	
						GC	(74.5 - 75) Dusky yellow brown clay, micaceous
80	203	9	105			CL	(75 - 77) Med. brown sandy clay mottled w/ dusky yellow brown, dark yellow brown and dark orange w/ gravel up to 2" dia.
85	198	10	100				(77 - 85) Dusky yellowish brown clay mottled w/ Lt. gray very fine to fine sand seams, lignitic material scattered throughout, (more Lt. gray sand between 83 and 85)
90							(85 - 87) No recovery (shelby tube broke off in hole)



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BORING LOG of 007G22LF

NSA MIDSOUTH
Millington, TN.

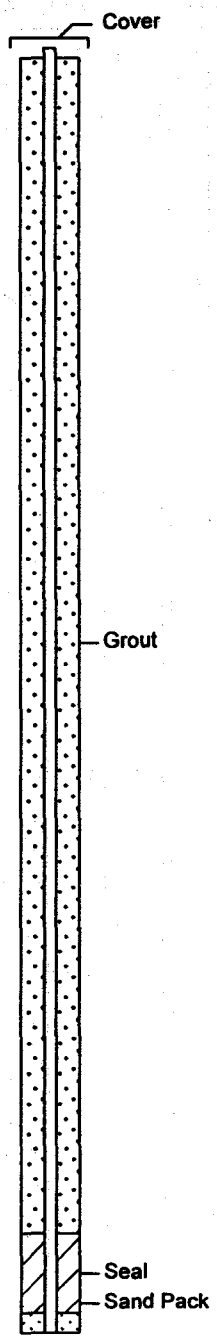
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1315 7/18/98	Northing	: 392658.10
Finished	: 0935 7/19/98	Easting	: 813905.90
Drilling Method	: Rotasonic	TOC Elevation	: 284.86
Drilling Company	: Allinance Drilling	Total Depth	: 77.5 feet
Geologist	: D. Ladd	Well Screen	: 67.5 to 77.5 feet

Geoprobe: 007G22LF
Elev.: 284.86

Depth in Feet	Surf. Elev. 285.15	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	285						(0 - 2.5) Concrete with sand and gravel subgrade
5	280	1	60	1500		ML	(2.5 - 7) Sitl, clayey, moderate yellowish brown w/ olive gray material, asphalt near top, diesel odor (7 - 10.5) Silt, clayey, olive gray, hard and dry, contains some dark yellowish brown material (10.5 - 11.5) Silt, clayey, modertrate yellowish brown to dark yellowish orange, mottled w/ olive gray, contains iron-manganese concretions, very dry, hard
10	275	2	50	900			(11.5 - 17) No recovery (17 - 27) Silt, clayey, moderate yellowish brown to dark yellowish orange, mottled w/ some dark yellowish orange, very moist
15	270						(27 - 29) Silt, clayey, moderate yellowish brown to dark yellowish orange, mottled w/ some olive gray, very moist
20	265	3	100	5			(29 - 37.5) Silt, clayey, olive gray to med. dark gray, containing iron-manganese nodules and Lt. olive brown material below 31. Near 37, becoming mostly med. dark gray and dark yellowish brown, moist
25	260						(37.5 - 46) Silt and clay, moderate yellowish brown to dark yellowish orange w/ Lt. gray to olive gray material, scattered iron-manganese nodules, becoming slightly sandy w/ more Lt. gray material near 46
30	255	4	100	15			
35	250						
40	245	5	80				
45	240					CL	(46 - 49.5) Clay, sand, very fine, and silt, moderate yellowish brown mottled w/ Lt. gray to olive gray and dark yellowish orange, scattered gravel, moist, contains iron-manganese nodules between 47 and 49.5
50	235	6	120			SC	(49.5 - 52.5) Sand, very fine to fine, and clay w/ scattered gravel, dark yellowish orange to moderate yellowish brown mottled w/ Lt. gray, Gravel up to 1 1/2" dia.,wet
55	230						(52.5 - 57.5) Sand, very fine to fine, dark yellowish orange to moderate yellowish brown, mottled w/ Lt. gray, scattered clay seams, Lt. gray clay seam w/ organic streaks at 56.5, wet
60	225	7	120			SP	
65							



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BORING LOG of 007G22LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1315 7/18/98	Northing	: 392658.10
Finished	: 0935 7/19/98	Easting	: 813905.90
Drilling Method	: Rotasonic	TOC Elevation	: 284.86
Drilling Company	: Allinance Drilling	Total Depth	: 77.5 feet
Geologist	: D. Ladd	Well Screen	: 67.5 to 77.5 feet

Geoprobe: 007G22LF
Elev.: 284.86

Depth in Feet	Surf. Elev. 285.15	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
65	220	7	120			SP	(57.5 - 67) Sand, corase to very coarse, and gravel, dark yellowish orange to very pale orange, gravel is chert and qtz, up to 2" dia. angular to rounded, wet, upper 1" is clayey
70	215	8	110	0.4		SP	(67 - 77.5) Sand, coarse to very coarse, and gravel, dark yellowish orange to very pale orange, gravel is chert and qtz, up to 2" dia. angular to rounded, wet, 67.5 to 70 is darker in color, containing lignitic sand grains, Red iron staining near 76, silt and smaller gravel from 76 to 77
75	210						
80	205	9	110			CL	(77.5 - 92.55) Clay, sandy, dusky yellowish brown to dark yellowish brown mottled w/ Lt. gray sand seams, scattered lignite,some gravel, very micacreous, more sand between 87 and 92.5
85	200					CL	
90	195	10	110			CL	
95	190					SC	(92.5 - 97) Sand, very fine to fine, Lt. gray w/ dark yellowish brown clay seams, abundant lignite and mica, wet (97 - 107) Sand, very fine to fine, color becoming olive gray to Lt. gray, less lignite and mica, wet
100	185	11	120	1500		SC	(107 - 117) Sand, very fine to fine, olive gray to Lt. gray, abuntant lignite, especially near 112, wet (117 - 127) Sand, very fine to fine, olive gray to Lt. gray, abuntant lignite at 119 and 123, piece of marcasite nodule at 118, clay sean (7" thick) at 126, wet
105	180					SC	
110	175	12	120	0.4		SC	
115	170					SC	
120	165	13	100			SC	
125	160					SC	
130							

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BORING LOG of 007G22UC

NSA MIDSOUTH
Millington, TN.

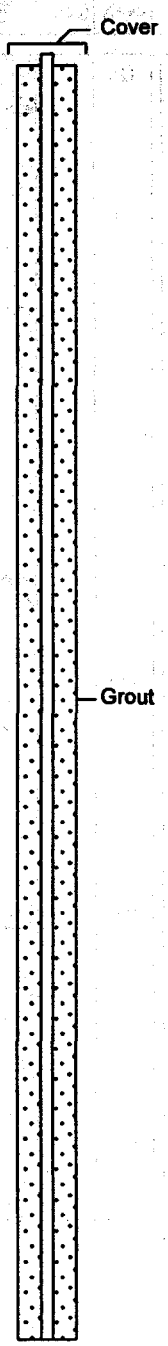
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: —— 7/19/98	Northing	: 392671.60
Finished	: —— 7/19/98	Easting	: 813899.00
Drilling Method	: Rotasonic	TOC Elevation	: 284.83
Drilling Company	: Allinance Drilling	Total Depth	: 103 feet
Geologist	: D. Ladd	Well Screen	: 93 to 103 feet

Geoprobe: 007G22UC
Elev.: 284.83

Depth in Feet	Surf. Elev. 285.05	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	285						(0 - 2.5) Concrete with sand and gravel subgrade
		1	60				(2.5 - 7) Sitl, clayey, moderate yellowish brown w/ olive gray material, asphalt near top, diesel odor (7 - 10.5) Silt, clayey, olive gray, hard and dry, contains some dark yellowish brown material (10.5 - 11.5) Silt, clayey, modertrate yellowish brown to dark yellowish orange, mottled w/ olive gray, contains iron-manganese concretions, very dry, hard (11.5 - 17) No recovery (17 - 27) Silt, clayey, moderate yellowish brown to dark yellowish orange, mottled w/ some dark yellowish orange, very moist (27 - 29) Silt, clayey, moderate yellowish brown to dark yellowish orange, mottled w/ some olive gray, very moist (29 - 37.5) Silt, clayey, olive gray to med. dark gray, containing iron-manganese nodules and Lt. olive brown material below 31. Near 37, becoming mostly med. dark gray and dark yellowish brown, moist (37.5 - 46) Silt and clay, moderate yellowish brown to dark yellowish orange w/ Lt. gray to olive gray material, scattered iron-manganese nodules, becoming slightly sandy w/ more Lt. gray material near 46
5	280						
10	275	2	50				
15	270						
20	265	3	100				
25	260					ML	
30	255	4	100				
35	250						
40	245	5	100				
45	240						
						CL	(46 - 49.5) Clay, sand, very fine, and silt, moderate yellowish brown mottled w/ Lt. gray to olive gray and dark yellowish orange, scattered gravel, moist, contains iron-manganese nodules between 47 and 49.5
50	235	6	120			SC	
55							



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BORING LOG of 007G22UC

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: —— 7/19/98	Northing	: 392671.60
Finished	: —— 7/19/98	Easting	: 813899.00
Drilling Method	: Rotasonic	TOC Elevation	: 284.83
Drilling Company	: Allinance Drilling	Total Depth	: 103 feet
Geologist	: D. Ladd	Well Screen	: 93 to 103 feet

Geoprobe: 007G22UC
Elev.: 284.83

Depth in Feet	Surf. Elev. 285.05	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
55	230	6	120			SC	(49.5 - 52.5) Sand, very fine to fine, and clay w/ scattered gravel, dark yellowish orange to moderate yellowish brown mottled w/ Lt. gray, Gravel up to 1 1/2" dia.,wet
60	225	7	120			SP	(52.5 - 57.5) Sand, very fine to fine, dark yellowish orange to moderate yellowish brown, mottled w/ Lt. gray, scattered clay seams, Lt. gray clay seam w/ organic streaks at 56.5, wet
65	220						(57.5 - 67) Sand, coarse to very coarse, and gravel, dark yellowish orange to very pale orange, gravel is chert and qtz, up to 2" dia. angular to rounded, wet, upper 1" is clayey
70	215	8	110				(67 - 77.5) Sand, coarse to very coarse, and gravel, dark yellowish orange to very pale orange, gravel is chert and qtz, up to 2" dia. angular to rounded, wet, 67.5 to 70 is darker in color, containing lignitic sand grains, Red iron staining near 76, silt and smaller gravel from 76 to 77
75	210						
80	205	9	110			CL	(77.5 - 92.55) Clay, sandy, dusky yellowish brown to dark yellowish brown mottled w/ Lt. gray sand seams, scattered lignite,some gravel, very micacreous, more sand between 87 and 92.5
85	200						
90	195	10	110				
95	190					SC	(92.5 - 97) Sand, very fine to fine, Lt. gray w/ dark yellowish brown clay seams, abundant lignite and mica, wet (97 - 105) Sand, very fine to fine, color becoming olive gray to Lt. gray, less lignite and mica, wet
100	185	11	120				
105	180						
110							

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BORING LOG of 007G23LF

NSA MIDSOUTH
Millington, TN.

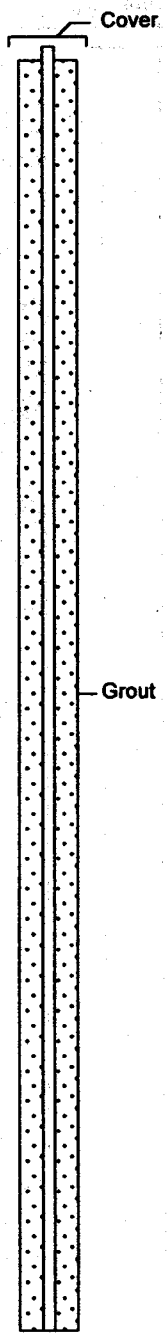
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0915 7/31/98	Northing	: 392728.40
Finished	: 1200 7/31/98	Easting	: 814087.30
Drilling Method	: Rotasonic	TOC Elevation	: 285.89
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: D. Ladd	Well Screen	: 72 to 82 feet

Geoprobe: 007G23LF
Elev.: 285.89

Depth in Feet	Surf. Elev. 286.15	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	286						(0 - 1.5) Concrete and asphalt
		1	40			CL	(1.5 - 2.5) Clay and silt, olive gray to greenish gray, moist
						ML	(2.5 - 9.5) Silt, moderate yellowish brown mottled w/ olive gray, decrease in olive gray material w/ depth
5	281						
10	276	2	45			CL	(9.5 - 10) Silt, olive gray to greenish gray (10 - 15) No recovery (15 - 19) Clayey silt,olive gray to greenish gray, becoming mottled w/ moderate yellowish brown material near 19, contains roof material at 17, moist
15	271						
20	266	3	85			ML	(19 - 25) Silt, moderate yellowish brown, mottled w/ dark yellowish orange and olive gray, contains organic material, especially near 25
25	261					CL	(25 - 36) Clay, silty, olive gray becoming mottled w/ dark yellowish orange and light olive brown material below 31, contains iron-manganese nodules below 31, some Lt. gray material at 36, moist (36 - 42.5) Clay, sandy, moderate yellowish brown to dark yellowish orange mottled w/ Lt. gray, scattered gravel near 42.5, iron-manganese nodules and organic material
30	256	4	85				
35	251						
40	246	5	90				
						SC	
45							



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BORING LOG of 007G23LF

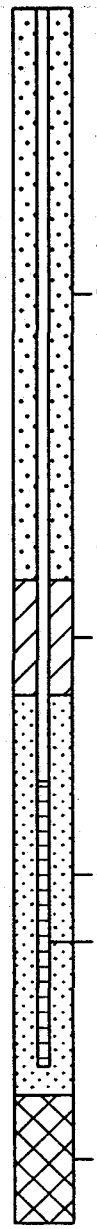
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0915 7/31/98	Northing	: 392728.40
Finished	: 1200 7/31/98	Easting	: 814087.30
Drilling Method	: Rotasonic	TOC Elevation	: 285.89
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: D. Ladd	Well Screen	: 72 to 82 feet

Geoprobe: 007G23LF
Elev.: 285.89

Depth in Feet	Surf. Elev. 286.15	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
45	241						
50	236	6	95			SC	(42.5 - 52) Sand, clay, and gravel, dark yellowish orange, traces of Lt. gray material, higher clay contents and less gravel near top, moist, hard, gravel mostly rounded chert (up to 3/4" dia., iron concretions, less gravel from 46 - 49, poorly sorted, moderate brown to dark reddish brown material from 50 to 52, moist to wet
						CL	(52 - 54) Clay, grayish orange mottled w/ moderate orange pink and grayish orange pink, moist, soft
55	231					SC	(54 - 55) Sand, very fine to fine, dark yellowish orange, grayish orange clay seams, wet
						CL	(55 - 56) Sand, very fine to fine, dark yellowish orange, micaceous, lignitic, wet
						SC	
						CL	(56 - 56.5) Clay, grayish orange mottled w/ moderate orange pink and grayish orange pink, moist, soft
60	226	7	95			SC	(56.5 - 57.5) Sand, very fine to fine, dark yellowish orange, micaceous, lignitic, wet
						CL	(57.5 - 58) Sand, very fine to fine, dusky yellowish brown mottled w/ dark yellowish orange and Lt. gray, micaceous, highly lignitic, wet
65	221					SC	(58 - 58.5) Clay, grayish orange mottled w/ moderate orange pink and grayish orange pink, moist, soft
							(58.5 - 61) Sand, very fine to fine, dark yellowish orange, micaceous, lignitic, wet
							(61 - 61.5) Clay, grayish orange to Lt. gray, moist, soft
70	216	8	90				(61.5 - 65)Sand, very fine to fine, dark yellowish orange, micaceous, lignitic, wet (65 - 66.5) Sand, very fine to fine, w/ scattered gravel, grayish orange to Lt. gray, scattered Lt. gray seams, wet (66.5 - 68.5) Sand, gravel and clay, olive gray to very Lt. gray, gravel up to 1" dia., poorly sorted, lignitic, wet
75	211					SW	(68.5 - 75) Sand, coarse to very coarse,and gravel (mostly chert, up to 2"), dark yellowish orange becoming grayish orange from 71 to 73 w/ less gravel, poorly sorted, highly lignitic, wet
80	206	9	85				(75 - 83.5) Sand med. to very coarse, and gravel, dark yellowish orange, gravel up to 3" dia. , mostly rounded qtz and rounded to angular chert, becoming angular near bottom w/ less sand, wet (83.5 - 85) Clay, dusky yellowish brown mottled w/ Lt. gray sand seams, highly lignitic, moist
85	201	10	100			CL	Shelby tube sample from 85 to 87.5
90							



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BORING LOG of 007G24MF

NSA MIDSOUTH
Millington, TN.

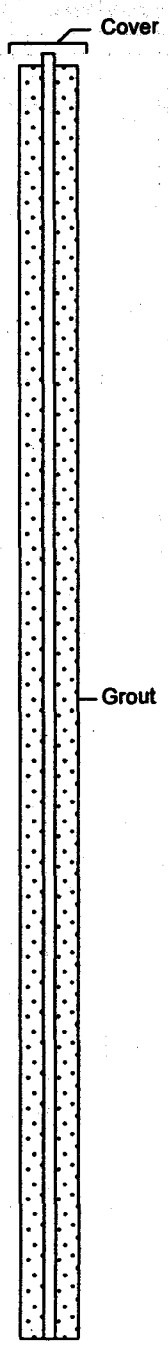
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0915 7/31/98	Northing	: 392815.60
Finished	: 1200 7/31/98	Easting	: 814610.90
Drilling Method	: Rotasonic	TOC Elevation	: 289.06
Drilling Company	: Allinance Drilling	Total Depth	: 95 feet
Geologist	: D. Ladd	Well Screen	: 60 to 70 feet

Geoprobe: 007G24MF
Elev.: 289.06

Depth in Feet	Surf. Elev. 289.31	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	289						(0 -2.5) Asphalt and concrete
		1	60				(2.5 - 9) Silt, moderate yellowish brown mottled w/ some olive gray near top, contains some asphalt at top, dry, hard
5	284						(9 - 20) No recovery
							(20 - 25) Silt, dark yellowish orange mottled w/ olive gray, contains organic nodules, micaceous, soft
10	279	2	35				(25 - 35.5) Silt and clay, olive gray to greenish gray, contains abuntant iron-manganese nodules, mottled w/ dark yellowish orange near top, moist
							(35.5 - 41) Silt and clay, moderate yellowish brown to dark yellowish orange, mottled w/ olive gray to greenish gray, contains organic material and abundant lignite near 41, moist
15	274						
20	269	3	25			ML	
25	264						
30	259	4	95				
35	254						
40	249	5	110				
						CL	(41 - 46) Clay, silty, w/ scattered gravel, moderate yellowish brown to dark yellowish orange mottled w/ a trace of Lt. gray material, gravel is small rounded chert and qtz., abundant iron concretions, becoming sandy near 45
45	244						
		6	100			SC	
50							



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BORING LOG of 007G24MF

NSA MIDSOUTH
Millington, TN.

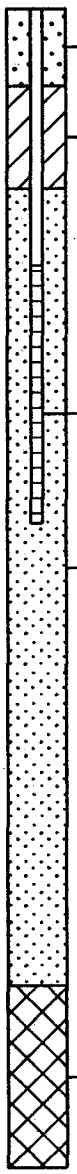
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0915 7/31/98	Northing	: 392815.60
Finished	: 1200 7/31/98	Easting	: 814610.90
Drilling Method	: Rotasonic	TOC Elevation	: 289.06
Drilling Company	: Allinance Drilling	Total Depth	: 95 feet
Geologist	: D. Ladd	Well Screen	: 60 to 70 feet

Geoprobe: 007G24MF
Elev.: 289.06

Depth in Feet	Surf. Elev. 289.31	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	239					SC	(46 - 46.5) Sand, very fine, and clay w/ gravel, moderate brown to reddish brown, very cohesive
		6	100				(46.5 - 52) Sand, fine to med. and clay w/ gravel, dark yellowish orange w/ some Lt. gray material, Gravel up to 2" dia., poorly sorted, abundant iron concretions, mostly Lt. gray near 52
55	234						(52 - 55) Sand, very coarse and gravel (up to 1 1/2"), dark yellowish orange, some clay content, wet
60	229	7	100				(55 - 65) Sand, very fine to fine, grayish orange to dark yellowish orange, upper 3' of section is mostly grayish orange and contains some Lt. gray, micaceous, lignitic, wet
							(65 - 75) Sand, very fine to fine, grayish orange to dark yellowish orange, mostly grayish orange pink at 66, contains Lt. gray clay seams at 72.5, contains more chert gravel at 74, wet
65	224						(75 - 85)Sand, very fine to fine, grayish orange, micaceous, lignitic, wet, Several pieces of chert gravel (up to 3/4" dia.) at 84 and 85
70	219	8	95			SP	(85 - 88.5) Sand, very coarse and gravel, dark yellowish orange, gravel mostly angular to rounded chert (up to 2 1/2" dia.), wet, poorly sorted
75	214						
80	209	9	95				
85	204						
90	199	10	100			CL	(88.5 - 95) Clay, sandy, dusky yellowish brown, becomes mottled w/ Lt. gray, very fine sand seams below 92, micaceous, lignitic
95	194						
100							



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BORING LOG of 007G25MF

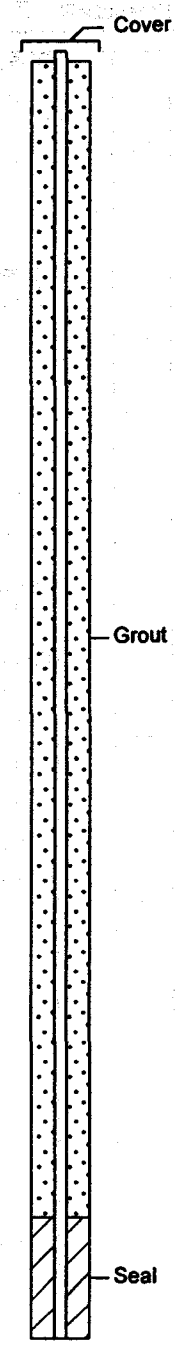
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0945 8/3/98	Northing	: 392888.00
Finished	: ------ 8/3/98	Easting	: 814789.90
Drilling Method	: Rotasonic	TOC Elevation	: 289.97
Drilling Company	: Allinance Drilling	Total Depth	: 81.50 feet
Geologist	: B. Brantley	Well Screen	: 71.5 to 81.5 feet

Geoprobe: 007G25MF
Elev.: 289.97

Depth in Feet	Surf. Elev. 290.30	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	290						(0 - 1.5) Concrete
		1	70				(1.5 - 2) Sand, gravel subgrade
5	285						(2 - 3) Lt. olive gray silt mixed w/ greenish gray silt, dry, hard (3 - 7.5) Dark yellowish brown to moderate yellowish brown silt, dry, hard
10	280	2	40				(7.5 - 9) Lt. olive gray and moderate yellowish brown silt, dry, hard, manganese inclusions from 8.5 to 9 (9 - 15) No recovery (15 - 19) Dark yellowish orange w/ Lt. olive grey and yellowish grey silt, manganese and iron streaks throughout, moist, med. stiff
15	275						(19 - 25) No recovery (25 - 29) Pale yellowish to dark yellowish brown silt w/ scattered manganese and iron staining (29 - 35) No recovery
20	270	3	40			ML	Driller uncertain whether loss of recovery at top or bottom of each run w/ loss. Loss has been assumed to be at bottom of run (35 - 38.5) Moderate yellowish brown clayey silt w/ dark yellowish orange and med. Lt. gray clayey silt.
25	265						
30	260	4	40				
35	255						
40	250	5	105			CL ML	(38.5 - 40) Lt. bluish grey clay lenses streaked in moderate yellowish brown clayey silt w/ dark yellowish orange and med. Lt. gray clayey silt.
45	245					CL	(40 - 42) Moderate yellowish brown clayey silt w/ dark yellowish orange and med. Lt. gray clayey silt. (42 - 47.5) Moderate yellowish brown sandy clay w/ Lt. olive gray streaks and iron staining, dry, hard to stiff, scattered chert gravel from 42 to 45, increasingly sandy and greater gravel contents from 45 to 47.5
50	240	6	85			GC SM	(47.5 - 52.5) Lt. brown clay, sand, gravel mixture w/ abundant iron staining, cementicious in sections to very hard
55	235						(52.5 - 53.5) Dark yellowish orange silty fine sand, moderate red w/ yellowish gray clay at 53 (3" thick)
60	230	7	85			SP	(53.5 - 61) Lt. gray fine sand w/ Lt. gray clay lense 4" thick between 53.5 to 55, moderate red w/ yellowish gray clay at 55 (12" thick) and 1" thick Lt. gray seams at 56 and 58 (61 - 65) Dark yellowish orange to grayish orange fine sand w/ Lt. gray fine sand
65							



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BORING LOG of 007G25MF

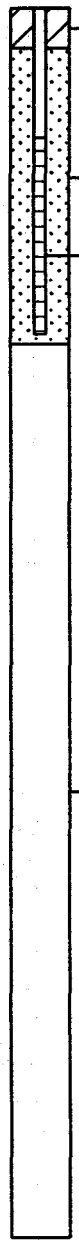
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0945 8/3/98	Northing	: 392888.00
Finished	: ------ 8/3/98	Easting	: 814789.90
Drilling Method	: Rotasonic	TOC Elevation	: 289.97
Drilling Company	: Allinance Drilling	Total Depth	: 81.50 feet
Geologist	: B. Brantley	Well Screen	: 71.5 to 81.5 feet

Depth in Feet	Surf. Elev. 290.30	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
65	225					CL	(65.5 - 69) Dark yellowish orange to grayish orange fine sand w/ Lt. gray fine sand (69 - 76) Grayish orange fine micaceous sand w/ scattered chert gravel, lignite grains within sand
70	220	8	85			SP	
75	215					CL	(76 - 77) Yellowish grey to grayish orange clay seam
80	210	9	80			SP	(77 - 92) Grayish orange fine micaceous sand w/ scattered chert gravel, lignite grains within sand
85	205						
90	200	10	90				
95	195					GW	(92 - 96) Lt. brown and dark yellowish orange sandy gravel (up to 2" dia.), poorly sorted, sand fine to very corase
100	190	11	80			SM	(96 - 101) Yellowish gray to olive gray fine silty sand (101 - 105) Lt. gray to grayish orange fine sand, lignitic and micaceous, few scattered chert gravel at 103
105	185					SP	(105 - 107) Yellowish gray fine sand w/ dark yellowish orange sand seam at 107
110	180	12	85				(107 - 109) Grayish orange fine sand w/ Lt. gray clay seams 1/8" to 1/4" thick (109 - 115) Lt. gray fine sand w/ Lt. gray clay seams (115 - 124) Lt. gray fine sand w/ grayish orange fine sand
115	175						
120	170	13	90				
125	165					SM	(124 - 125) Pale brown and dark yellowish brown silty sand, lignite at bottom of run
		14	100			SC	(125 - 127) Shelby tube pushed from 125 to 127, bottom contains lignite within a clay matrix
130							

Geoprobe: 007G25MF
Elev.: 289.97



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BORING LOG of 007G26MF

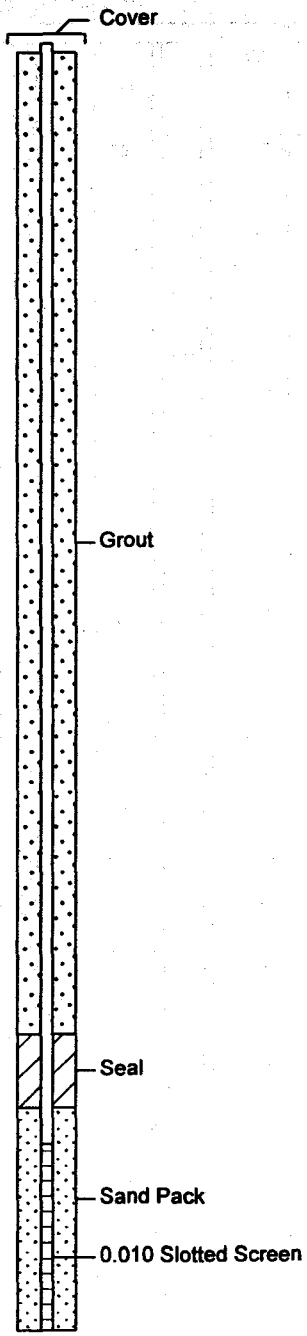
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1455 8/2/98	Northing	: 392954.10
Finished	: 1645 8/2/98	Easting	: 814922.50
Drilling Method	: Rotasonic	TOC Elevation	: 290.13
Drilling Company	: Allinance Drilling	Total Depth	: 70 feet
Geologist	: B. Brantley	Well Screen	: 60 to 70 feet

Depth in Feet	Surf. Elev. 290.40	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	290						(0 - 2) Concrete w/ sand and gravel subgrade
		1	100	Bkg			(2 - 5) Moderate yellowish brown silt, very stiff to hard
5	285						(5 - 7) Moderate yellowish brown silt mixed w/ olive gray silt, contains wood fragments, very stiff to hard
							(7 - 15) Dark yellowish orange silt mixed w/ olive gray silt w/ iron and manganese inclusions
10	280	2	40	Bkg			(15 - 19.5) Lt. olive gray clayey silt w/ iron streaks, moist to wet, med. stiff
							(19.5 - 20.5) Moderate yellowish brown clayey silt w/ Lt. gray clayey silt w/ manganese
15	275						(20.5 - 25) Dark yellowish orange clayey silt w/ Lt. olive gray clayey silt, iron streaks throughout, slightly moist, more stiffer
							(25 - 33) Moderate yellowish brown clayey silt, moist, stiff
20	270	3	90	0.4		ML	(33 - 35) Moderate yellowish brown and Lt. olive gray clayey silt w/ iron staining, moist, stiff
							(35 - 42) Moderate yellowish brown and Lt. olive gray clayey silt w/ iron staining, moist, stiff to hard, manganese inclusions from 35 to 37, pebbles scattered from 40 to 42
25	265						
30	260	4	75	0.2			
35	255						
40	250	5	100	0.2			
						CL	(42 - 44) Dark yellowish orange sandy silty clay steaked w/ Lt. gray, pebbles scattered throughtout (1/4" to 1/2" dia.), dry, stiff
45	245					SC	
							(44 - 45) Dark yellowish orange clayey sand w/ pebbles scattered throughout, moist, med. stiff
50	240	6	95	Bkg		SM	(45 - 46) Dark yellowish orange clayey sand w/ gravel scattered throughout, moist, med. stiff
							(46 - 47) Moderate reddish brown cemented mixture of clay, sand, pebbles and gravel
55	235					CL	(47 - 54) Grayish orange to dark yellowish orange silty fine sand
							(54 - 55) Moderate red clay mixed w/ dark yellowish orange and yellowish gray silty fine sand
60	230	7	85	0.2		SP	(55 - 70) Grayish orange fine sand mixed w/ dark yellowish orange and yellowish gray fine sand (micaceous), moderate red to Lt. red w/ pinkish gray clay seams at 56.5, 57.5, 58, 60, 61, and 63, seams range between 1" and 4" thick, few scattered gravel (up to 1/2" dia.) near 66
65	225						
		8	60	Bkg			
70							

Geoprobe: 007G26MF
Elev.: 290.13



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BORING LOG of 007G27LF

NSA MIDSOUTH
Millington, TN.

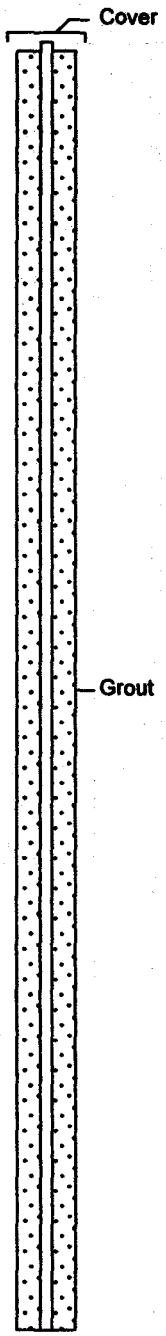
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0800 7/20/98	Northing	: 392553.50
Finished	: 1600 7/20/98	Easting	: 812680.90
Drilling Method	: Rotasonic	TOC Elevation	: 276.77
Drilling Company	: Allinance Drilling	Total Depth	: 117 feet
Geologist	: D. Ladd	Well Screen	: 107 to 117 feet

Geoprobe: 007G27LF
Elev.: 276.77

Depth in Feet	Surf. Elev. 276.86	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	276	1	90			ML	(0 - 5) Silt, clayey, moderate yellowish brown mottled w/ a little Lt. olive gray, especially at 4, contains roots and organic material
5	271	2	100				(5 - 7) Silt, clayey, moderate yellowish brown mottled w/ a little Lt. olive gray, contains roots and organic material, iron-manganese nodules
10	266	3	80				(7 - 17) Silt, very clayey, moderate yellowish brown mottled w/ less Lt. olive gray, abundant organic material (17 - 23) Silt, very clayey, moderate yellowish brown mottled w/ Lt. olive gray, abundant organic material (23 - 27) Silt, olive gray w/ iron-manganese nodules
15	261						(27 - 36) Silt, olive gray to Lt. olive gray w/ abundant iron-manganese nodules below 30, becoming mottled w/ moderate yellowish brown and Lt. olive brown material from 32 to 36, very dry and hard near 36
20	256	4	65				(36 - 41) Silt, moderate yellowish brown to dark yellowish orange, containing iron-manganese nodules, dark yellowish brown and olive gray material becoming slightly sandy from 37 to 41
25	251						
30	246	5	100				
35	241						
40	236	6	80			CL	(41 - 46) Clay, silt and sand, very fine, moderate yellowish brown mottled w/ dark yellowish orange and Lt. gray, Lt. gray is mostly clay, contains iron-manganese nodules, moist
45	231					SC	
						CL	(46 - 47) Sandy, very fine, and clay, Lt. gray, moist
						SW	(47 - 48) Clay, silt, sand, very fine, and gravel (up to 1/2" dia.), moderate yellowish brown mottled w/ Lt. gray and dark yellowish orange
50	226	7	90	0.2		SP	
						SC	(48 - 49.5) Sand, fine to med., and gravel (up to 1/4"), very pale orange, some moderate yellowish brown clay, wet
55	221					SP	(49.5 - 50.5) Sand , fine, dark yellowish orange mottled w/ Lt. gray, some gravel at 50.5, wet
60	216	8	85				(50.5 - 55) Sand, very fine, clayey, Lt. brownish gray, becoming mottled w/ dark yellowish orange and sand becoming coarser near 55
65	211						
70		9	65				



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BORING LOG of 007G27LF

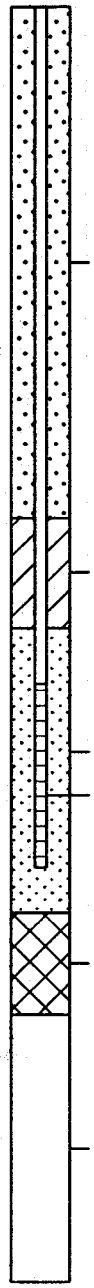
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0800 7/20/98	Northing	: 392553.50
Finished	: 1600 7/20/98	Easting	: 812680.90
Drilling Method	: Rotasonic	TOC Elevation	: 276.77
Drilling Company	: Allinance Drilling	Total Depth	: 117 feet
Geologist	: D. Ladd	Well Screen	: 107 to 117 feet

Geoprobe: 007G27LF
Elev.: 276.77

Depth in Feet	Surf. Elev. 276.86	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
70	206	9	65			SW	(70 -77) Sand, very fine to fine, dark yellowish orange, contains gravel seams w/ coarse to very coarse sands at 74 and 75, otherwise contains trace of gravel throughout, trace of clay seams, ferrigenous sand zone at 74, wet
75	201						(77 - 82) Sand, very fine to fine, mostly grayish orange w/ a corase dark yellowish orange gravelly zone at 79, traces of scattered gravel throughout
80	196	10	90			SP	(82 - 86.5) Sand, coarse to very coarse and gravelly, (up to 2"), dark yellowish orange to grayish orange, ferrigenous sandy zone near 85, gravel is chert and qtz, wet
85	191					GP	
						SP	(86.5 - 87) Gravel (up to 3" dia.), contains a little sand
90	186	11	70			GP	(87 - 88) Sand, very coarse and gravelly, dark yellowish orange, gravel is fine (up to 1/8"), wet
						SP	
						GP	(88 - 91) Gravel (up to 2 1/2") and sand, very coarse, dark yellowish orange, little sand content, poorly sorted, wet
95	181					SP	(91 - 92) Sand, very coarse and gravel (up to 1/2"), dark yellowish orange, rounded to angular qtz and chert, wet
100	176	12	75	0.4		SC	(92 - 92.5) Gravel up to 2 1/2" dia., scattered sand, rounded to angular qtz and chert, wet
							(92.5 - 93) Sand, very fine, dark yellowish orange, one piece of chert gravel 2" dia.
105	171						(93 - 97) Gravel and sand, very coarse, dark yellowish brown to dark yellowish orange, chert and qtz, rounded to angular, up to 1 1/2", wet
110	166	13	85				(97 - 98) Sand, very coarse, and gravel (up to 1") , dark yellowish orange, poorly sorted, wet
115	161						(98 - 107) Sand, very coarse, and gravel (up to 3"),clayey, dark yellowish orange to grayish orange, color becoming darker near 107
120	156	14	85			CL	(107 - 117) Sand, very coarse, and gravel (up to 2"),clayey, dark yellowish orange to grayish orange, Lt gray clay seam at 111, traces of red iron staining, becomes darker in color and silty from 115 to 117
							(117 - 125) Clay, sand, fine to very coarse, gravel (up to 1 1/2"), dusky yellowish brown to dark yellowish brown, clay seams throughout, very lignitic, slightly micaceous, wet
125	151					GW	(125 - 127) Gravel (up to 1 1/2") and sand, very coarse, dark yellowish orange silty, dusky yellowish brown to dark yellowish brown clay near 127, wet
130	146	15	100			CL	(127 - 128) Gravel and sand, dusky yellowish brown to dark yellowish brown,wet
135	141	16	100				(128 - 139.5) Clay, dusky yellowish brown to dark yellowish brown w/ some Lt. gray sand seams scattered through upper 5 feet, abundant lignite, especially near 128, micaceous, stiff to very hard
140							



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BORING LOG of 007G28LF

NSA MIDSOUTH
Millington, TN.

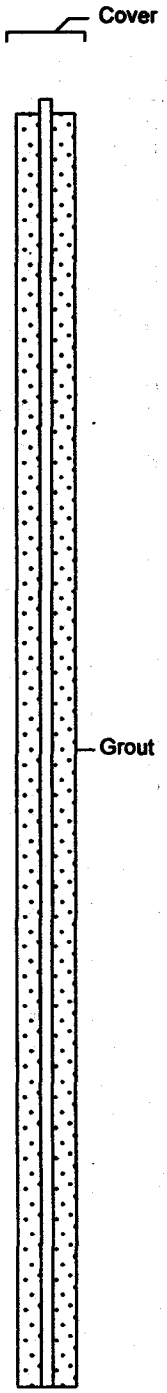
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1345 7/17/98	Northing	: 393309.60
Finished	: 1630 7/17/98	Easting	: 813467.30
Drilling Method	: Rotasonic	TOC Elevation	: 281.91
Drilling Company	: Allinance Drilling	Total Depth	: 80.5 feet
Geologist	: D. Ladd	Well Screen	: 70.5 to 80.5 feet

Depth in Feet	Surf. Elev. 281.87	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	281					FILL	(0 - 3) Asphalt, clay, red sand, pebbles, lost first 1 - 2 feet
		1	50			CL	(3 - 7,5) Clay and silt, moderate yellowish brown, some olive gray material, stiff
5	276					ML	(7.5 - 12) Silt, olive gray to greenish gray, traces of root material
10	271	2	75			CL	(12 - 14) Clay, dark yellowish brown to dusky yellowish brown, stiff
15	266					ML	(14 - 17) Silt, olive gray to greenish gray, iron-manganese nodules (17 - 27) Silt, clayey, moderate yellowish brown mottled w/ dark yellowish orange and olive gray, iron-manganese nodules (27 - 36) Silt, clayey, moderate yellowish brown mottled w/ dark yellowish orange and olive gray, iron-manganese nodules, becoming more clayey w/ more olive gray material, Lt. olive brown and Lt. gray material near bottom (36 - 37) Slightly silt, clayey, Lt. olive brown w/ traces of Lt. gray, dry, hard
20	261	3	95				
25	256						
30	251	4	85				
35	246						
40	241	5	100			CL	(37 - 50.5) Clay, silt, and sand, very fine, dark yellowish orange, becomes progressively sandier w/ depth, becomes mottled w/ Lt. gray sand below 41, and contains olive gray clay from 41 to 41.5, moist
45							

Geoprobe: 007G28LF
Elev.: 281.91



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BORING LOG of 007G28LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1345 7/17/98	Northing	: 393309.60
Finished	: 1630 7/17/98	Easting	: 813467.30
Drilling Method	: Rotasonic	TOC Elevation	: 281.91
Drilling Company	: Allinance Drilling	Total Depth	: 80.5 feet
Geologist	: D. Ladd	Well Screen	: 70.5 to 80.5 feet

Geoprobe: 007G28LF
Elev.: 281.91

Depth in Feet	Surf. Elev. 281.87	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
45	236	5	100			CL	
50	231	6	100			SW	(50.5 - 53) Sand, med to coarse and gravel (up to 1" dia.), grayish orange, poorly sorted, rounded to angular, wet, Lt. gray material at top
55	226					SP	(53 - 56) Sand, coarse to very coarse, w/ scattered small gravel, very pale orange to grayish orange, wet (56 - 57.5) Sand, coarse to very coarse, moderate yellowish brown to dark yellowish orange, w/ some Lt. gray clayey material, gravel up to 3/4" dia from 56 to 57 and 3" dia. from 57 to 57.5, wet
						GP	(57.5 - 59) Gravel w/ scattered sand, gravel 1/2" dia. at top and increasing to 2 1/2" dia. near 59
60	221	7	100				(59 - 72) Sand, coarse to very coarse, dark yellowish orange, gravel up to 2" dia. (72 - 77) No recovery (77 - 81) Sand, coarse to very coarse, dark yellowish orange, gravel up to 2" dia., lignitic sand grains
65	216						
70	211	8	50			SP	
75	206						
80	201	9	100				(81 - 89.5) Clay, slightly sandy, dusky yellowish brown to dark yellowish brown mottled w/ Lt. gray sandy seams, micaceous, slightly lignitic, stiff
85	196					CL	Bottom of boring at 87, shelby tube sample taken from 87 to 89.5
		10	90				
90							

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BORING LOG of 007G29LF

NSA MIDSOUTH
Millington, TN.

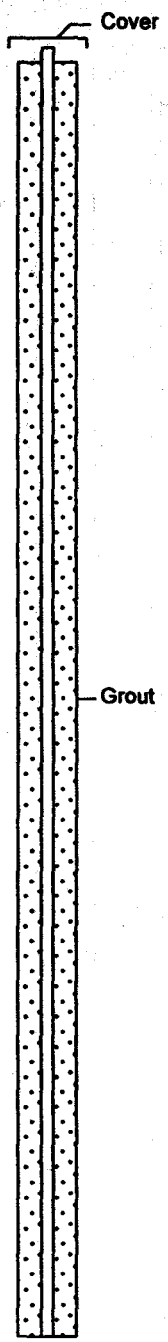
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1050 7/16/98	Northing	: 393384.30
Finished	: 1615 7/16/98	Easting	: 813594.00
Drilling Method	: Rotasonic	TOC Elevation	: 282.29
Drilling Company	: Allinance Drilling	Total Depth	: 80 feet
Geologist	: D. Ladd	Well Screen	: 70 to 80 feet

Geoprobe: 007G29LF
Elev.: 282.29

Depth in Feet	Surf. Elev. 283.37	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	283	1	100				(0 - 1) Asphalt (1 - 4) Silt, clayey, moderate yellowish brown, organic material and roots, stiff (4 - 5) Silt, clayey, moderate yellowish brown, organic material and roots, stiff, contains asphalt from 4 to 4.5
5	278	2	100			ML	(5 - 9.5) Silt, olive gray, dry, becoming clayey between 7 and 9.5 (9.5 - 17) Silt, clayey, moderate yellowish brown mottled w/ olive gray and dark yellowish orange, mostly olive gray material from 11 to 15, iron-manganese nodules and organic material (17 - 25) Silt, clayey, moderate yellowish brown mottled w/ olive gray and dark yellowish orange, becoming moist and containing less iron-manganese nodules and organic material, color becomes mostly olive gray near bottom
10	273	3	75				
15	268						
20	263	4	85				
25	258					CL	(25 - 27) Clay, olive gray, contains traces of organic material and iron-manganese nodules (27 - 33) Clay and silt, moderate yellowish brown mottled w/ olive gray, some drk yellowish orange staining, mostly olive gray near 33
30	253	5	100				
35	248					ML	(33 - 35) Silt, moderate yellowish brown mottled w/ Lt. gray, numerous iron-manganese nodules (35 - 37) Silt, Lt. olive brown w/ traces of iron-manganese nodules
40	243	6	100			CL	(37 - 39) Clay, silty, moderate yellowish brown mottled w/ dark yellowish orange and abundant organic streaks, sandy near 39 (39 - 46) Clay, sand, fine, and silt, dark yellowish orange to moderate yellowish brown, Lt. gray to pale yellowish gray material from 44 to 46, pale yellowish gray seam at 46
45							



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BORING LOG of 007G29LF

NSA MIDSOUTH
Millington, TN.

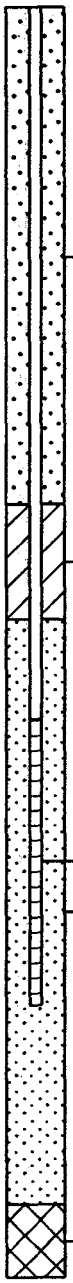
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1050 7/16/98	Northing	: 393384.30
Finished	: 1615 7/16/98	Easting	: 813594.00
Drilling Method	: Rotasonic	TOC Elevation	: 282.29
Drilling Company	: Allinance Drilling	Total Depth	: 80 feet
Geologist	: D. Ladd	Well Screen	: 70 to 80 feet

Geoprobe: 007G29LF
Elev.: 282.29

Depth in Feet	Surf. Elev. 283.37	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
45	238	6	100			CL	
						SC	(46 - 48) Sand, med. to coarse, and clay, dark yellowish orange mottled w/ Lt. gray, some organic streaks between 47 and 48
						SP	(48 - 50) Sand, coarse, and scattered gravel (up to 1/2" dia.), abundant iron staining
50	233	7	100			SC	(50 - 55) Sand, fine, clayey, Lt. olive gray (sand) and olive gray (clayey material), becomes mottled w/ pale orange material near 55, some iron staining near 55 (55 - 56.5) Sand, fine tovery fine, slightly clayey, Lt. gray becoming mottled w/ pale orange near 56.5, some iron staining, slightly lignitic and micaceous
55	228						
						SW	(56.5 - 58) Sand, med to very coarse, dark yellowish orange, wet, gravel (up to 1 1/2" dia.) between 57 and 58, some iron staining
						SC	(58 - 59.5) Sand, very fine to fine, dark yellowish orange to very pale orange, slightly clayey, lignitic, wet
60	223	8	100			SP	(59.5 - 67) Sand, coarse to very coarse, and gravel (up to 2"), mostly chert, poorly sorted, dark yellowish orange, wet (67 - 77) Sand, coarse to very coarse, and gravel (up to 2"), chert and qtz.,rounded to angular, poorly sorted, dark yellowish orange, wet, dark yellowish orange and black sand grains in a 3" zone at 69
65	218						
							(77 - 79.5) Sand, coarse to very coarse, and gravel (up to 2 1/2"), chert and qtz.,rounded to angular, poorly sorted, dark yellowish orange, wet, some dusky yellowish brown material near 79.5
70	213	9	100				
75	208						
80	203	10	100			CL	(79.5 - 89.5) Clay, slightly silty, dusky yellowish brown to dark yellowish brown mottled w/ Lt. gray very fine sand seams, predominate sand seams at 85 and 86, very micaceous, scattered lignite, stiff Bottom of boring at 87, shelby tube taken at 87 - 89.5, no recovery
85	198	11	0				
90							



ENSAFE

BORING LOG of 007G30LF

NSA MIDSOUTH
Millington, TN.

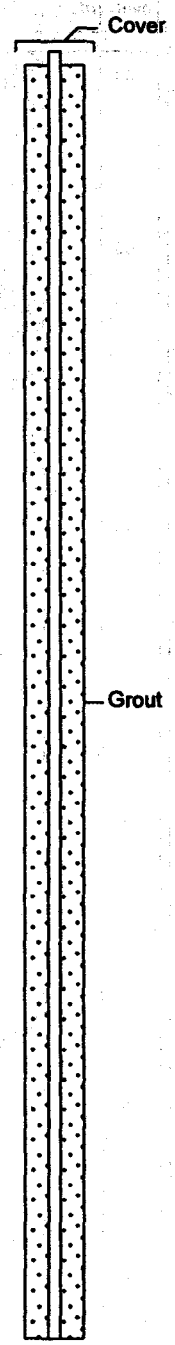
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1130 7/15/98	Northing	: 393468.20
Finished	: 1730 7/15/98	Easting	: 813714.30
Drilling Method	: Rotasonic	TOC Elevation	: 282.99
Drilling Company	: Allinance Drilling	Total Depth	: 80 feet
Geologist	: D. Ladd	Well Screen	: 70 to 80 feet

Depth in Feet	Surf. Elev. 283.07	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	283						(0 - 1) Asphalt
		1	60				(1 - 5) Silt, clayey, moderate yellowish brown, roots and some asphalt material (5 - 10) no recovery (10 - 12.5) Silt, clay, Lt. olive gray mottled w/ some moderate brown, moist
5	278						(12.5 - 15) Silt, clayey, moderate yellowish brown mottled w/ dark yellowish orange and Lt. olive gray, some organic material, traces of iron-manganese nodules (15 - 19) No recovery
10	273	2	40				(19 - 22) Silt, very clayey, moderate yellowish brown mottled w/ very little dark yellowish orange, very moist (22 - 28) Silt, clayey, olive gray to greenish gray mottled w/ moderate yellowish brown from 25 to 28, moist (28 - 33) Silt, slightly clay, moderate yellowish brown w/ dark yellowish orange streaks, some reddish brown streaks at 33
15	268						(33 - 37.5) Clay, silty, olive gray mottled w/ moderate yellowish brown and dark yellowish orange, stiff, slightly sandy and lignitic near bottom
20	263	3	40			CL	
25	258						
30	253	4	50				
35	248						
40	243	5	110			ML	(37.5 - 42.5) Silt, sand, fine to very fine, and clay, moderate yellowish brown mottled w/ dark yellowish orange and olive gray, some organic material
						SC	
45							

Geoprobe: 007G30LF
Elev.: 282.99



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ENSAFE

BORING LOG of 007G30LF

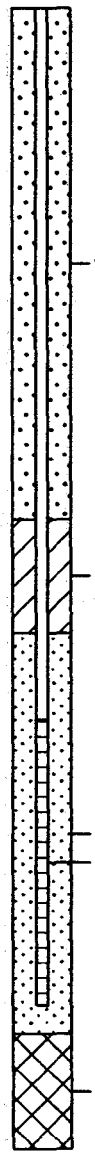
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1130 7/15/98	Northing	: 393468.20
Finished	: 1730 7/15/98	Easting	: 813714.30
Drilling Method	: Rotasonic	TOC Elevation	: 282.99
Drilling Company	: Allinance Drilling	Total Depth	: 80 feet
Geologist	: D. Ladd	Well Screen	: 70 to 80 feet

Geoprobe: 007G30LF
Elev.: 282.99

Depth in Feet	Surf. Elev. 283.07	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
45	238					SC	(42.5 - 46) Sand, very fine to med., clayey, moderate yellowish brown mottled w/ dark yellowish orange and Lt. gray, becoming olive gray from 45 to 46
						CL	(46 - 50.5) Clay, sandy, dusky yellowish brown, contains a pale yellowish brown to Lt. gray sand seam at 50, slightly micaceous
50	233	6	105				
						SC	(50.5 - 53) Sand, fine to med. Lt. gray w/ clayey seams, pale yellowish brown near top and bottom, micaceous, wet
						CL	(53 - 53.5) Clay, Lt. gray, and gravel (up to 1"), moist
						SW	(53.5 - 55) Sand, fine to coarse, and gravel (up to 1 1/2" dia.), dark yellowish orange, some gravel is iron stained, iron concretions near top
55	228					SP	(55 - 65) Sand, coarse, and gravel, moderate yellowish brown to dark yellowish orange, contains dark yellowish brown to dusky yellowish brown sand from 57 to 58, qtz. and chert, up to 2" dia., rounded to angular, poorly sorted, wet
60	223	7	105				
							(65 - 74) Sand, coarse, and gravel, moderate yellowish brown to dark yellowish brown from 70 to 71.5, sand becoming dark yellowish orange and alittle silty at 74, qtz. and chert, up to 2" dia., rounded to angular, poorly sorted, wet
65	218						
70	213	8	100	2.0			
75	208					GP	(74 - 76) Gravel and sand, coarse to very coarse, dark yellowish orange, gravel up to 3" dia., mostly chert, poorly sorted, micaceous, wet
						SP	(76 - 81) Sand, coarse to very coarse, and gravel, dark yellowish brown, gravel up to 3" dia. poorly sorted, wet, becoming lighter in color near 81
80	203	9	105				
						CL	(81 - 85) Clay, dusky yellowish brown, contains some Lt. gray sandy seams, stiff
							Bottom of boring at 85
85	198						
90							



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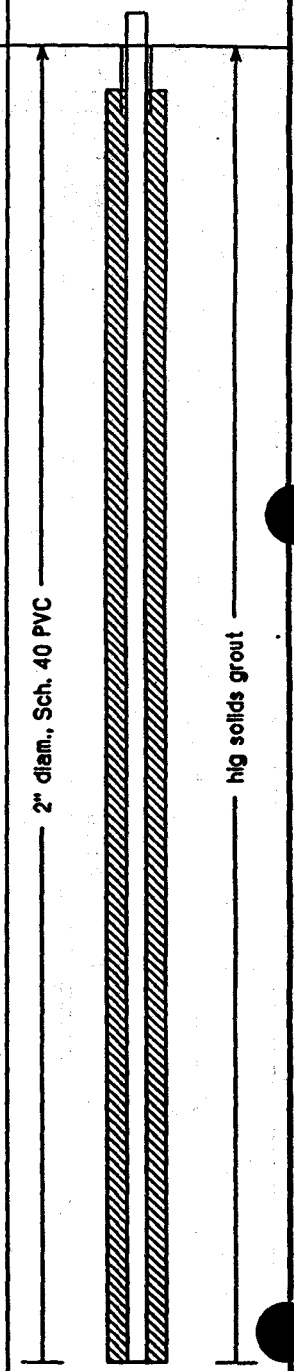
EnSafe Inc.

Log of Monitoring Well 007G31LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1045 on 11/18/98*	TOC Elevation: *feet msl*
Completed at *1600 on 11/18/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface conditions: grassy area south of runway, west of 007G28LF.	
								ML	(0'-5') Clayey silt, yellow-brown, friable and dry.	
5			1	100					(5'-8') Clayey silt, gray-greenish gray, medium stiff and moist.	
								CL	(8'-9') Clay, dusky brown to dark gray, stiff to hard, and dry.	
10									(9'-14') Clayey silt, greenish gray with yellow-orange iron staining, medium stiff and moist.	
									Manganese inclusions from 12'-14'.	
									Same as above to 16'.	
15			2	90						
									(16'-25') Clayey silt, yellow-gray and yellow-orange, soft and wet, with manganese inclusions throughgout.	
20								ML		
25			3	85					Same as above to 29'.	
30									(29'-32.5') Clayey silt, olive gray and dark brown with iron staining, stiff and dry.	

WELL DIAGRAM



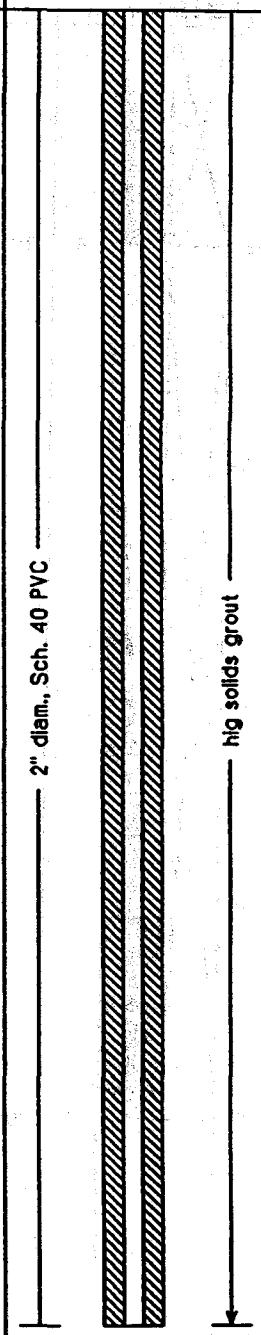
EnSafe Inc.

Log of Monitoring Well 007G31LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1045 on 11/18/98*	TOC Elevation: *feet msl*
Completed at *1600 on 11/18/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML		
								CL	(32.5'-34.5') Silty clay, grayish green, stiff and moist near bottom foot of core.	
35			4	100				ML	(34.5'-35') Clayey silt, orange to brown, stiff to hard, and dry. Same as above, moist and soft from 36'-40'. (40'-43') Clayey silt, mottled gray and orange-brown, stiff and moist.	
40										
45			5	100				ML	Clayey silt, as above, becoming sandy at 43'. Same as above to 51', increasingly sandy, stiff to soft, moist.	
50										
55								SW	(51'-67') Gravelly sand, brownish orange, medium- to coarse-grained, well graded and wet, gravels up to 1.5" in diameter (LD).	
60										

WELL DIAGRAM



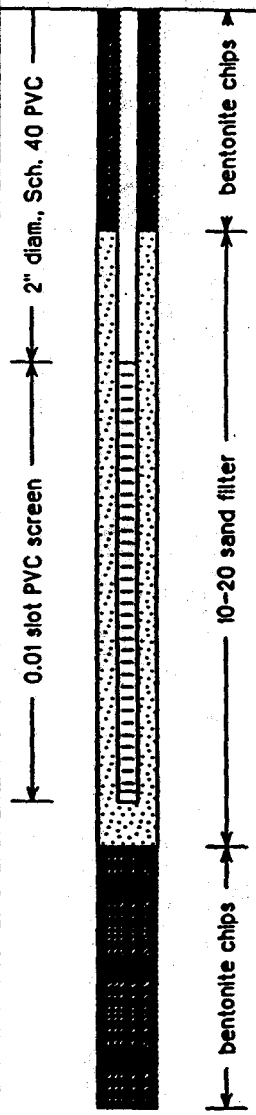
EnSafe Inc.

Log of Monitoring Well 007G31LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1045 on 11/18/98*	TOC Elevation: *feet msl*
Completed at *1600 on 11/18/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLONS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
65			6	80				SW		
								SP	(67'-69') Sand, tan, fine- to medium-grained.	
70								SW	(69'-79') Sand with gravels resuming at 69'.	
75								GW	(75'-79') Silty and sandy gravels, orange to brown, gravels up to 3" in diameter (LD).	
80								CL	(79'-85') Clay, dusky brown, with seams of fine gray sand, very stiff to hard, and dry.	
85			7	100					*End of boring at 85.*	
90										

WELL DIAGRAM



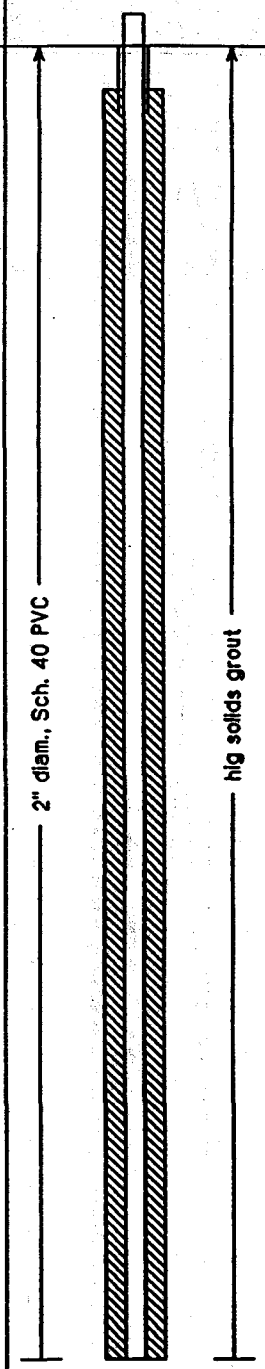
EnSafe Inc.

Log of Monitoring Well 007G32LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0840 on 11/19/98*	TOC Elevation: *feet msl*
Completed at *1530 on 11/19/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *90 feet*
Geologist: *Ben Brantley*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface conditions: grassy area, approximately 5-10 yds. north of the taxiway, 300 ft. west of 007G11LF.	
									(0'-7.5') Clayey silt, yellow-brown, stiff and dry.	
								ML		
5			1	100						
									(7.5'-8.5') Clayey silt, greenish gray to yellowish orange to yellowish gray, moist and stiff, with manganese inclusions near bottom of extrusion.	
10									(8.5'-15') No Recovery.	
								No R		
15			2	35					(15'-16') Clayey silt, greeenish gray, moist and stiff.	
									(16'-26') Clayey silt, yellowish brown, moist and soft.	
20										
								ML		
25			3	100						
									(26'-28') Silt to clayey silt, gray, medium stiff and moist.	
									(28'-35') Clayey silt, olive green to greenish gray, stiff to hrad, and dry.	
30										

WELL DIAGRAM

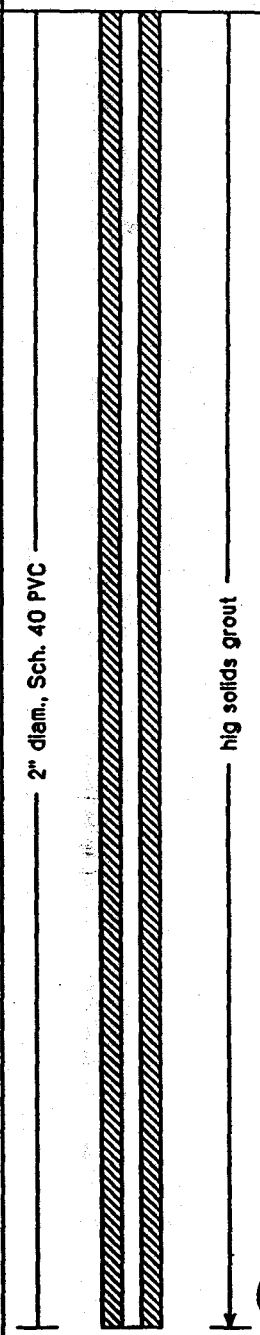


EnSafe Inc.

Log of Monitoring Well 007G32LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0840 on 11/19/98*	TOC Elevation: *feet msl*
Completed at *1530 on 11/19/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *90 feet*
Geologist: *Ben Brantley*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								ML	Same as above with iron staining from 32'-39'.		
35			4	100							
40									(39'-45') Clayey silt, mottled yellowish brown and reddish orange, with gray streaks, stiff. Same as above, becoming sandy with scattered pebbles (~1/4" diam. LD) from 41'-45', medium stiff and moist.		
45								ML CL	(45'-47.5') Silt and clay, gravelly and sandy, yellowish brown and light gray, medium stiff.		
50								SW	(47.5'-55') Sand, silty, with gravel (up to 1" diam. LD, chert), yellowish brown. Same as above; sand ranges from fine- to coarse-grained, with gravels up to 2" diam. LD. Silt content decreasing past 51'.		
55			5	93					Same as above to 59'.		
60								GW	(59'-72') Sandy gravel, orange brown; gravels up to 2" diam. LD, with sand as fine- to coarse-grained.		



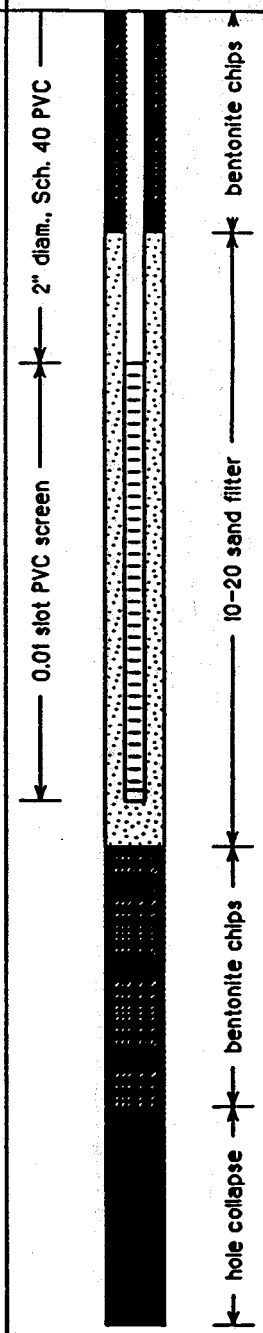
EnSafe Inc.

Log of Monitoring Well 007G32LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0840 on 11/19/98*	TOC Elevation: *feet msl*
Completed at *1530 on 11/19/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *90 feet*
Geologist: *Ben Brantley*	Well Screen: *68 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
65								GW		
70										
								No R	(72'-75') No Recovery.	
75			6	85				GW	Same as above to 78'.	
80								CL	(78'-90') Clay, dusky brown with light gray sand seams, very stiff; thin (1mm) lignite seams intermittent throughout run.	
85									Increasing sand content from 84'-88'.	
90			7	113						

WELL DIAGRAM



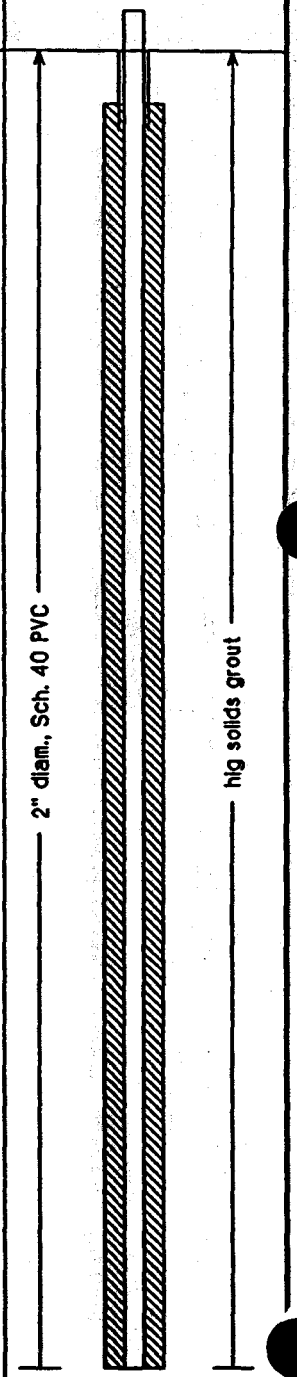
EnSafe Inc.

Log of Monitoring Well 007G33LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1555 on 11/19/98*	TOC Elevation: *feet msl*
Completed at *1200 on 11/20/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface conditions: grassy area between taxiway and runway, approx. 100 ft. east of western access strip between taxiway and runway.	
									(0'-4') Clayey silt, dark brown, hard and dry.	
5			1	80				ML	Same as above to 7.5'.	
									(7.5'-10') Clayey silt, yellowish brown and olive gray, stiff and moist.	
									Manganese inclusions from 9'-10'.	
10								No R	No Recovery from 10'-15'.	
15			2	50						
									(15'-28') Clayey silt, yellowish brown and olive gray, stiff, moist.	
20								ML		
25			3	100						

WELL DIAGRAM



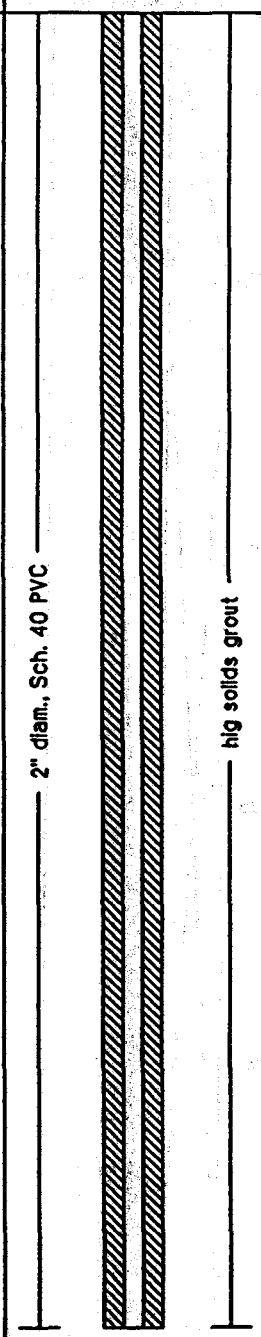
EnSafe Inc.

Log of Monitoring Well 007G33LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1555 on 11/19/98*	TOC Elevation: *feet msl*
Completed at *1200 on 11/20/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
30								ML	(28'-31') Clayey silt, greenish gray, stiff to hard and dry.	
									(31'-34') Clayey silt, yellowish brown with greenish gray and light gray mottling, stiff and dry.	
								No R	No Recovery.	
35			4	90					Same as above (clayey silt) to 48'.	
40								ML		
45									Becoming sandy at 44', increasingly sandy to 48'.	
								GW	(48'-49') Sandy gravel, orangish brown.	
50								No R	No Recovery from 49'-55'.	

WELL DIAGRAM



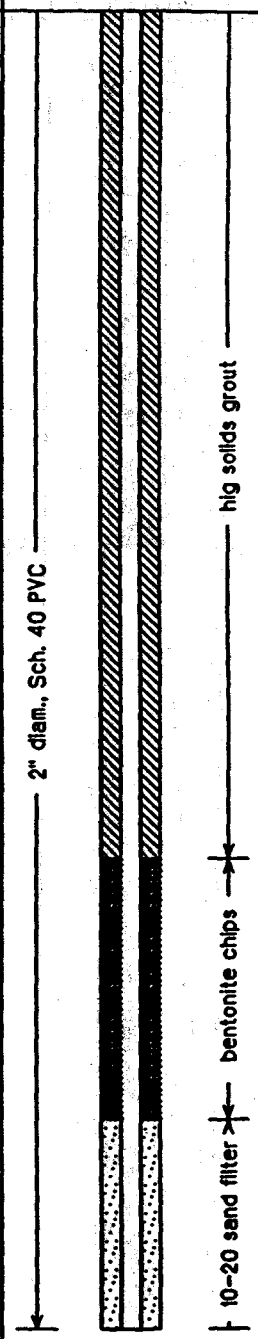
EnSafe Inc.

Log of Monitoring Well 007G33LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1555 on 11/19/98*	TOC Elevation: *feet msl*
Completed at *1200 on 11/20/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								No R		
55			5	70				GW	(55'-64') Sandy gravel, orangish brown, gravels up to 1" diam. LD, with well graded sand.	
60										
65								SW	(64'-76') Sand, yellowish brown, fine- to medium-grained, with pebble- sized gravels throughout.	
70										
75			6	100						

WELL DIAGRAM



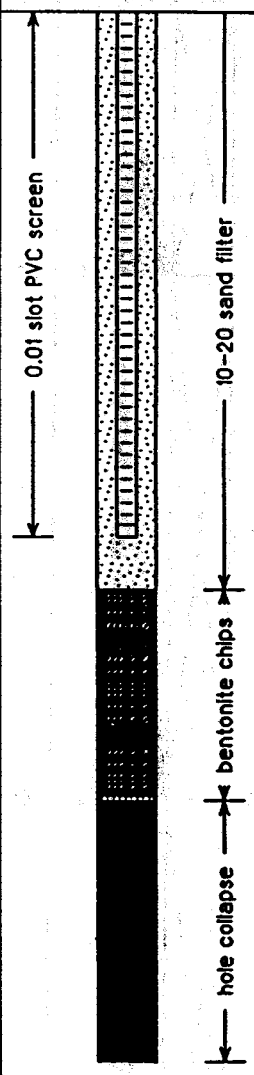
EnSafe Inc.

Log of Monitoring Well 007G33LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1555 on 11/19/98*	TOC Elevation: *feet msl*
Completed at *1200 on 11/20/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								SW		
								GW	(76'-86') Sandy gravel, yellowish brown, with gravels ranging from pea size up to 2" diam. LD.	
80										
85			7	100						
								CL	(86'-95') Silty clay, dusky brown, hard and waxy with local thin seams of lignite throughout; minor sand (fine-grained and gray in color) lenses throughout as well.	
90										
95			8	130					*End of boring at 95'.*	
100										

WELL DIAGRAM



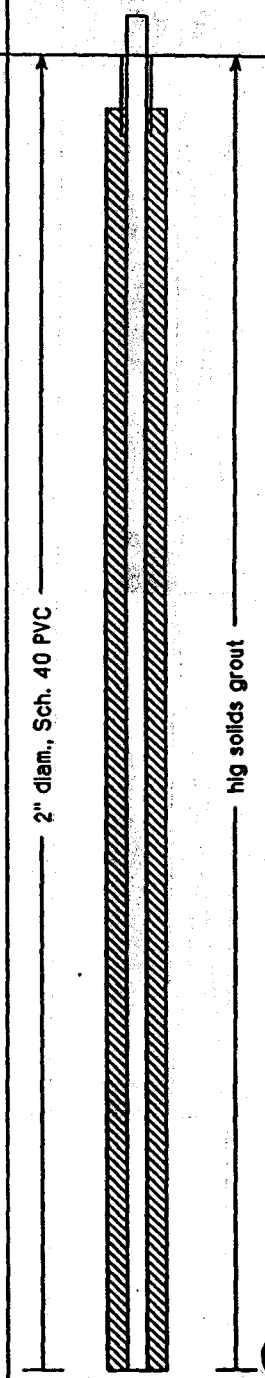
EnSafe Inc.

Log of Monitoring Well 007G34LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0930 on 11/21/98*	TOC Elevation: *feet msl*
Completed at *1530 on 11/21/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *81 to 91 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface conditions: grassy area near northern fence, approx. 175 ft. north of the runway and approx. 200 ft. west of the old runway strip.	
									(0'-4') Clayey silt, dark brown, friable and dry.	
									Iron staining visible from 3'-4'.	
5			1	80				ML	(5'-8') Clayey silt, greenish gray, soft and moist.	
									(8'-11.5') Clayey silt, mottled yellowish brown and gray, stiff and moist, with manganese inclusions throughout.	
10										
								No R	No Recovery from 11.5'-15'.	
15			2	65						
									Same as above, increasingly soft and wet with depth toward 25'; iron staining and manganese inclusions throughout.	
20								ML		
25			3	100						

WELL DIAGRAM



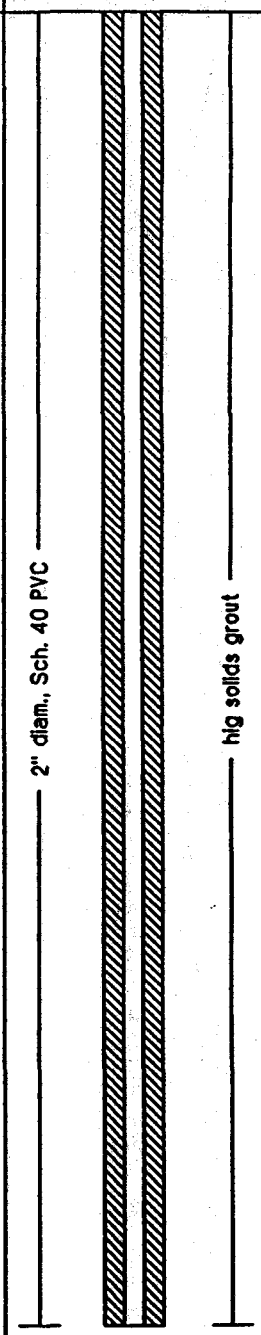
EnSafe Inc.

Log of Monitoring Well 007G34LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0930 on 11/21/98*	TOC Elevation: *feet msl*
Completed at *1530 on 11/21/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *81 to 91 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									(25'-32') Clayey silt, olive grayish brown, with iron staining, soft and wet.	
30										
									(32'-37') Clayey silt, greenish gray mottled with olive green iron- stained clayey silt.	
35			4	100				ML		
									(37'-43') Clayey silt, mottled brown and light gray, stiff and moist.	
40										
									(43'-46') Sandy silt, mottled orangish brown and light gray, stiff and moist.	
45										
								SP	(46'-48') Sand, fine-grained, mottled light gray with orange and with yellowish brown, moist to wet and micaceous.	
								No R	No Recovery from 48'-55'.	
50										

WELL DIAGRAM



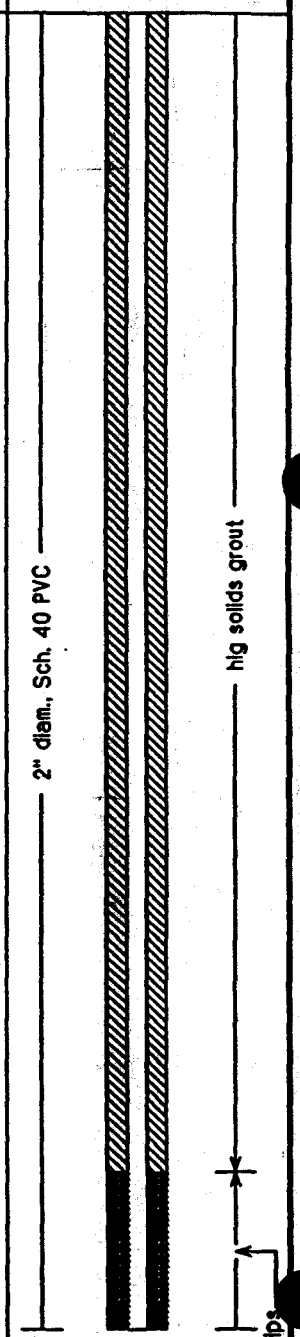
EnSafe Inc.

Log of Monitoring Well 007G34LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0930 on 11/21/98*	TOC Elevation: *feet msl*
Completed at *1530 on 11/21/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *81 to 91 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								No R		
55			5	65				SW	(55'-58') Sand, brownish orange, well graded (fine- to coarse-grained) with scattered gravels (up to 1" diam. LD), micaceous.	
60								SP	(58'-60) Sand, yellowish brown to tan, poorly graded (well sorted, no gravels), micaceous. (60'-63') Same as above, with color change to orangish brown medium- grained sand. (63'-64') Same as above, with color change to mottled tan and light gray fine-grained sand.	
65								SW	(64'-67') Sand, brownish orange, well graded (with gravels up to 1" diam. LD).	
70								SP	(67'-73') Sand, tan to light gray, poorly graded (fine- to medium- grained, no gravels).	
								No R	No Recovery from 73'-75'.	
75			6	90				SP		

WELL DIAGRAM



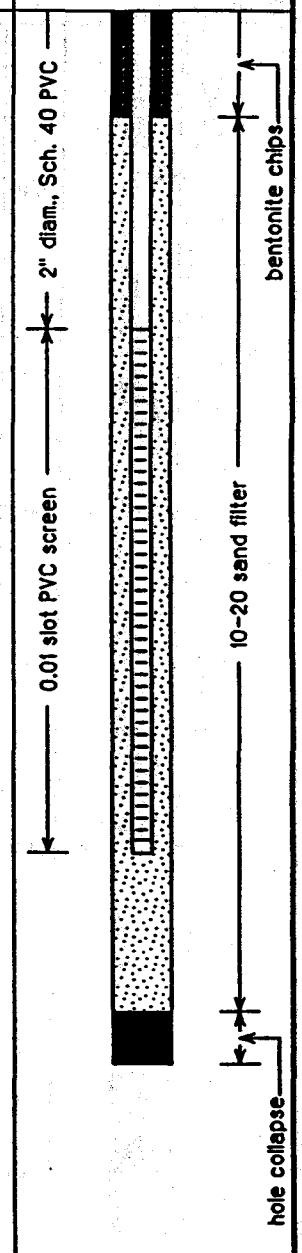
EnSafe Inc.

Log of Monitoring Well 007G34LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0930 on 11/21/98*	TOC Elevation: *feet msl*
Completed at *1530 on 11/21/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *81 to 91 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								SP	Same as above to 78'.	
80								SW	(78'-79.5') Sand, dark orangish brown, well graded (fine- to medium- grained, with gravels up to 1.5" diam. LD). (79.5'-82') Sand, yellowish brown, well graded (fine- to medium- grained, with scattered pebbles up to 1/4" diam. LD). (82'-90') Sand, brownish orange, well graded (medium- to coarse- grained, with gravels).	
85										
90								ML	(90'-95') Sandy silt, dark gray, very stiff, with gray clay a clay lens (~1/8" thick) between 90'-91'.	
95			7	80					*End of boring at 95'.*	
100										

WELL DIAGRAM



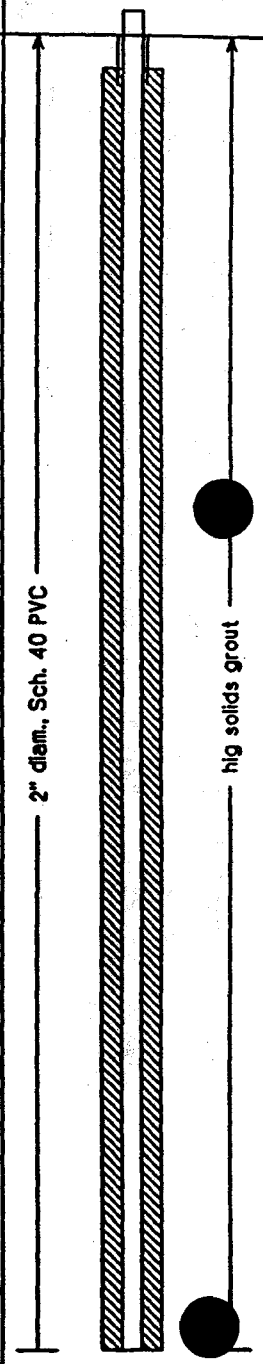
EnSafe Inc.

Log of Monitoring Well 007G35LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0930 on 11/21/98*	TOC Elevation: *feet msl*
Completed at *1600 on 11/22/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *81 to 91 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface conditions: grassy area approx. 250 west of 007G34LF, wets of old runway, north of present runway.	
5			1	100					(0'-7') Clayey silt, dark brown, hard and friable, dry.	
10									(7'-16') Clayey silt, greenish to olive gray mottled with yellowish brown clayey silt, manganese inclusions throughout, stiff and dry.	
15			2	95					(16'-26') Clayey silt, yellowish brown and olive gray, iron manganese inclusions throughout, medium stiff and moist.	
20								ML		
25			3	100					(26'-29') Clayey silt, dark gray, stiff and moist.	
30									(29'-35') Color change to dark greenish gray, with iron staining. Increasingly stiff and dry, with increased iron staining within the last 2 feet (33'-35') of run.	
35			4	95					Same as above to 38'.	
40									(38'-40') Clayey silt, yellowish brown, stiff and moist.	

WELL DIAGRAM



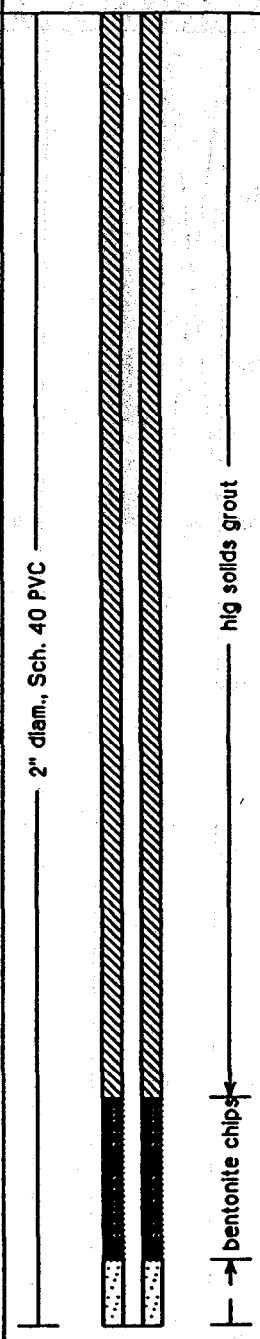
EnSafe Inc.

Log of Monitoring Well 007G35LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0930 on 11/21/98*	TOC Elevation: *feet msl*
Completed at *1600 on 11/22/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *81 to 91 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML	(40'-43') Sandy silt, yellowish brown and gray, stiff. (43'-45') Same as above with gravels up to 1" diam. LD.	
45								SW	(45'-51') Gravelly sand, mottled gray, yellowish brown, and orangish brown; well graded (fine- to coarse-grained sand with gravels up to 3/4" diam. LD).	
50								No R	No Recovery from 51'-55'.	
55			5	80				SW	(55'-60') Sand, well graded (medium-grained, well sorted sand with poorly sorted sandy gravels, coarsening downward to 60').	
60								SP	(60'-61') Sand, yellowish brown and orangish brown, very fine-grianed. (61'-72.5') Sand, yellowish brown and orangish brown, fairly well sorted (poorly graded), fine- to medium-grained; very few, rare pebbles in section.	
65										
70										
								SW	(72.5'-73') Sand, orangish brown, medium- to coarse-grained, with gravels.	
								No R	No Recovery from 73'-75'.	
75			6	93				SP	(75'-91') Sand, fine- to medium-grained, gravels very rare to none except near 90'-91'.	
80										

WELL DIAGRAM



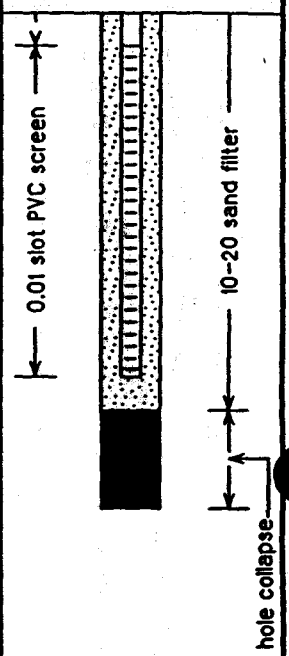
EnSafe Inc.

Log of Monitoring Well 007G35LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *0930 on 11/21/98*	TOC Elevation: *feet msl*
Completed at *1600 on 11/22/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *81 to 91 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85								SP		
90								ML	(91'-94') Sandy silt, dark gray, with thin (<1mm) lignite lenses.	
95			7	95					*End of boring at 95'.*	
100										
105										
110										
115										
120										

WELL DIAGRAM



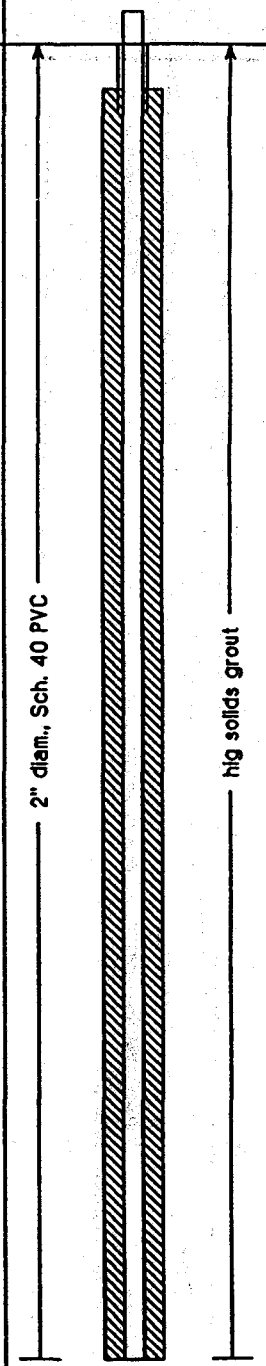
EnSafe Inc.

Log of Monitoring Well 007G36LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1140 on 11/22/98*	TOC Elevation: *feet msl*
Completed at *1540 on 11/22/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *82 to 92 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface conditions: grassy area approx. 250 ft. west of 007G35LF, north of active runway and west of old runway.	
									(0-4.5') Clayey silt, dark brown and yellowish brown, stiff and moist, manganese inclusions throughout.	
5			1	90						
									Same as above to 7'.	
									(7'-17') Clayey silt, dark brown, hard and stiff, dry.	
10										
15			2	85				ML		
									(17'-28') Clayey silt, greenish gray, with iron staining, stiff and dry.	
20										
25			3	100					(25'-28') Same as above, soft and wet, without manganese inclusions.	
									(28'-34.5') Clayey silt, mottled yellowish brown and olive gray, soft and moist.	
30										

WELL DIAGRAM



EnSafe Inc.

Log of Monitoring Well 007G36LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1140 on 11/22/98*	TOC Elevation: *feet msl*
Completed at *1540 on 11/22/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *82 to 92 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
35			4	95				ML	Same as above; stiff and dry throughout, with manganese inclusions, from 35'-43'.		2" diam., Sch. 40 PVC; hig solids grout
40											
45								CL	(43'-48') Sandy clay, mottled yellowish brown, orangish brown, and gray, stiff and with a few scattered pebbles.		
								SW	(48'-49') Sand, orangish brown with pebble-size gravels.		
50								GW	(49'-51') Sandy gravel, orangish brown, gravels up to 1.5" diam. LD.		
								No R	No Recovery from 51'-55'.		
55			5	80				GW	Same as above to 56', gravels up to 2" diam. LD.		
								SP	(56'-66') Sand, mottled yellowish brown, orangish brown, and gray, fine- to medium-grained, well sorted (poorly graded) and micaceous.		
60											

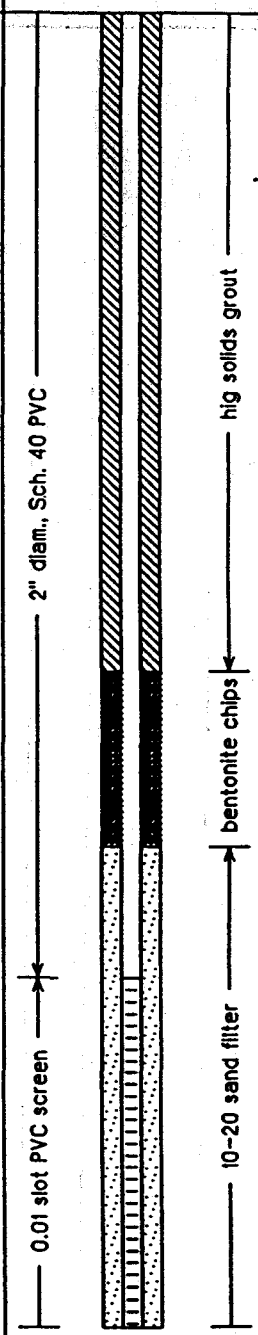
EnSafe Inc.

Log of Monitoring Well 007G36LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1140 on 11/22/98*	TOC Elevation: *feet msl*
Completed at *1540 on 11/22/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *82 to 92 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
65								SP		
								CL	(66'-67') Clay, mottled pink and light gray, plastic.	
								SP	(67'-68') Sand, mottled gray and orangish brown, very fine-grained.	
								CL	(68'-69.5') Clay, mottled ppink and light gray, very stiff and plastic.	
70								SC	(69.5'-71.5') Clayey sand, reddish orange, fine-grained.	
75			6	100				SW	(71.5'-82') Sand (mottled yellowish brown and reddish orange, medium- to coarse-grained, poorly sorted/well graded) with gravels.	
80										
85								GW	(82'-92.5') Sand (orangish brown, coarse- to medium-grained) with gravels up to 2" diam. LD.	
90										

WELL DIAGRAM



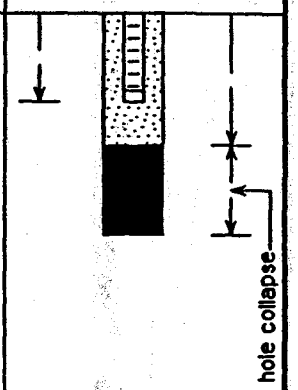
EnSafe Inc.

Log of Monitoring Well 007G36LF

Project: *NSAMEM, SWMU 7*	Location: *NSA Memphis, Millington, TN*
Project No.: *0094-001*	Surface Elevation:
Started at *1140 on 11/22/98*	TOC Elevation: *feet msl*
Completed at *1540 on 11/22/98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Boart-Longyear*	Total Depth: *95 feet*
Geologist: *Ben Brantley*	Well Screen: *82 to 92 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								GW		
								ML	(92.5'-95') Sandy silt, dark gray, with liginitic laminations throughout section.	
95			7	100					***End of boring at 95'.***	
100										
105										
110										
115										
120										

WELL DIAGRAM



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BORING LOG of 007G37F1

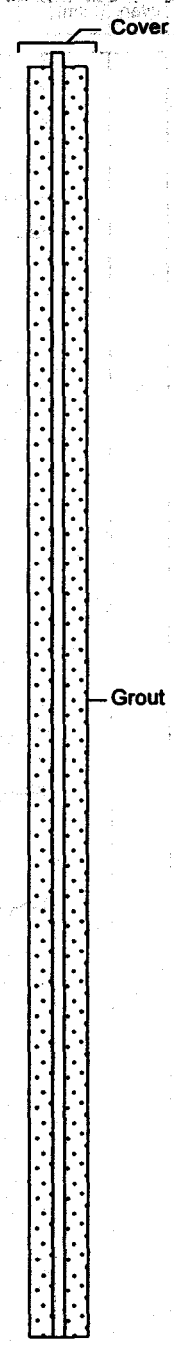
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: —— 7/14/99	Northing	: 393729.29
Finished	: —— 7/14/99	Easting	: 812560.30
Drilling Method	: Rotasonic	TOC Elevation	: 280.29
Drilling Company	: Allinance Drilling	Total Depth	: 90 feet
Geologist	: B. Brantley	Well Screen	: 50 to 90 feet

Depth in Feet	Surf. Elev. 280.96	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	280	1				ML	(0 - 2) Lt. brown clayey silt, moist (2 - 5) Lt. brown clayey silt, dry, hard (5 - 7) Yellowish brown and greenish gray clayey silt, moist, soft to med. stiff
5	275	2					(7 - 16) Yellowish brown and greenish gray clayey silt w/ manganese and iron stains, moist, soft to med. stiff (16 - 21) Yellowish brown and greenish gray clayey silt, moist, soft to med. stiff
10	270						(21 - 25) Lt. olive gray clayey silt w/ iron sttaining, moist, med. stiff (25 - 35) Olive gray silt w/ rusty brown streaks, moist, very stiff
15	265	3					(35 - 37) Lt. brown yellowish orange greenish gray clayey silt, moist, very stiff manganese streaks at 36
20	260						
25	255	4					
30	250						
35	245	5				CL	(37 - 41) Lt. brown silty clay w/ Lt. gray streaks, moist, very stiff (41 - 50) Lt. brown sandy clay w/ Lt. gray streaks (sand increases with depth), moist, very stiff
40	240						
45							

Geoprobe: 007G37F1
Elev.: 280.29



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BORING LOG of 007G37F1

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: —— 7/14/99	Northing	: 393729.29
Finished	: —— 7/14/99	Easting	: 812560.30
Drilling Method	: Rotasonic	TOC Elevation	: 280.29
Drilling Company	: Allinance Drilling	Total Depth	: 90 feet
Geologist	: B. Brantley	Well Screen	: 50 to 90 feet

Geoprobe: 007G37F1
Elev.: 280.29

Depth in Feet	Surf. Elev. 280.96	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
45	235					CL	
50	230	6				SC	(50 - 51.5) Lt. grayish tan clayey sand, wet
						SW	(51.5 - 55.5) Reddish brown to Lt. brown med. to coarse sand w/ gravel (up to 2" dia.)
55	225					SP	(55.5 - 57.5) Yellowish brown (tan) fine grained sand
						SW	(57.5 - 65) Yellowish brown (tan) med. to coarse grained sand w/ gravel (up to 1/2" dia.) (65 - 69) Yellowish brown (tan) med. to coarse grained sand w/ gravel (increases content and size with depth)
60	220	7					
65	215						
70	210	8				SP	(69 - 71) Tan fine sand
						SW	(71 - 75) Tan fine to coarse sand w/ gravel
75	205					GW	(75 - 85) Lt. brown sandy gravel (up to 2" dia.) (85 - 90) Lt. brown sandy gravel w/ increase in sand contents and less gravel (up to 2" dia.)
80	200	9					
85	195	10					
90							

ENSAFE

BORING LOG of 007G37LF

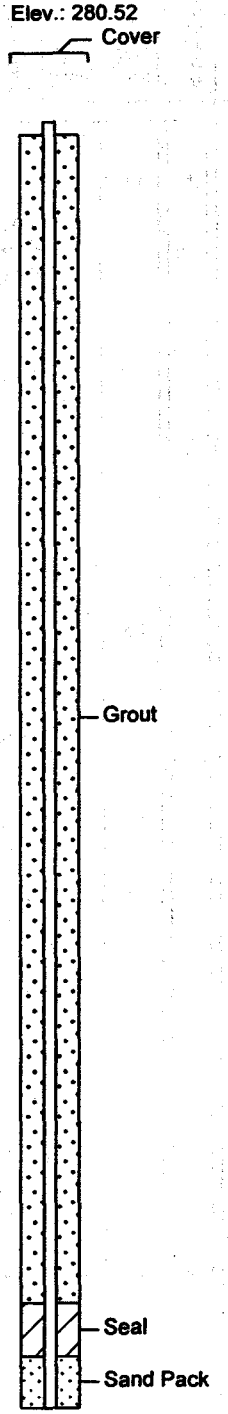
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1440 2/1/99	Northing	: 393714.18
Finished	: 1010 2/2/99	Easting	: 812575.75
Drilling Method	: Rotasonic	TOC Elevation	: 280.59
Drilling Company	: Alliance Drilling	Total Depth	: 91 feet
Geologist	: B. Brantley	Well Screen	: 51 to 91 feet

Depth in Feet	Surf. Elev. 280.52	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	280	1	60			ML	(0 - 3) Lt. brown silt, wet 0" - 6", dry and hard 6"- 3'
5	275	2	110			ML	(5 - 8) Lt. brown and olive gray silt w/ manganese, moist, med. stiff (8 - 15) Lt. brown silt, moist, med. stiff
10	270						
15	265	3	100			ML	(15 - 20) Lt. brown silt w/ trace of manganese, moist, med. stiff (20 - 25) Lt. gray and Lt. brown silty, moist, soft and med. stiff
20	260						
25	255	4	100			CL	(25 - 32) Greenish gray silty clay,very moist, varies from soft to med. stiff (32 - 43) Lt. brown w/ orange brown and gray silty clay, dry, very stiff (43 - 46) Lt. brown with gray sandy clay, moist, soft (46 - 49) Gray w/ LT. brown sandy clay w/ trace of gravel, wet, very stiff
30	250						
35	245	5	100				
40	240						
45	235	6	100			SW	
50							

Geoprobe: 007G37LF
Elev.: 280.52



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BORING LOG of 007G37LF

NSA MIDSOUTH
Millington, TN.

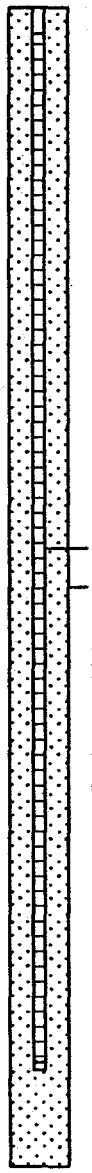
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1440 2/1/99	Northing	: 393714.18
Finished	: 1010 2/2/99	Easting	: 812575.75
Drilling Method	: Rotasonic	TOC Elevation	: 280.59
Drilling Company	: Alliance Drilling	Total Depth	: 91 feet
Geologist	: B. Brantley	Well Screen	: 51 to 91 feet

Geoprobe: 007G37LF
Elev.: 280.52

Depth in Feet	Surf. Elev. 280.52	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	230	6	100			SW	(49 - 54) Orange brown med. coarse sand, w/ gravel (up to 2" in diameter
						SP	(54 - 55) Lt. brown (tan) fine sand
55	225	7	75			SW	(55 - 56) Orange brown fine to coarse sand w/ gravel (up to 1.5")
						SP	(56 -60) Tan brown fine sand
60	220					SW	(60 - 74) Orange brown med. coarse sand w/ gravel (up to 1.5")
65	215	8	100				
70	210						
75	205	9	95			GW	(74 - 90) Orange brown sandy clay w/ gravel (up to 2")
80	200						
85	195	10	95				
90	190					SW	(90 - 91.5) Lt. brown fine to coarse sand, clayey w/ trace of pebbles
						SP	(91.5 - 92) Tan brown fine sand, silty and clayey w/ trace of pebbles (92 - 95) Greenish gray and dark brown silty sand, very lignitic, wet
95	185						
100							



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BORING LOG of 007G37L1

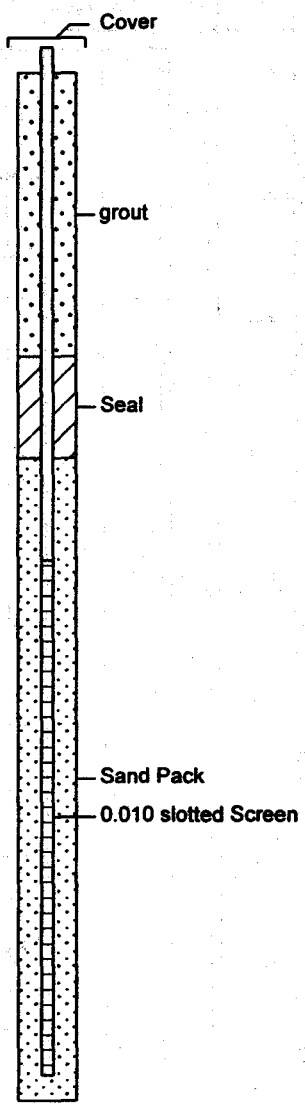
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1400 7/20/99	Northing	: 393722.68
Finished	: 1440 7/20/99	Easting	: 812553.28
Drilling Method	: Rotasonic	TOC Elevation	: 280.13
Drilling Company	: Alliance Drilling	Total Depth	: 20 feet
Geologist	: C. Davis	Well Screen	: 10 to 20 feet

Depth in Feet	Surf. Elev. 280.94	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	280	1	80			ML	(0 - 5) Lt. brown clayey (slightly) silt, slightly moist
5	275					ML	(5 - 8) Lt. gray clayey silt w/ mottled iron staining, slightly moist to moist, medium stiff
10	270	2	75			ML	(8 -15) Lt. brown to Lt. yellowish-orange brown clayey silt w/ some gray mottling and iron-mang. nodules, moist, slightly stiff
15	265	3	70			ML	(15 - 20) Lt. brown and Lt. gray mottled clayey silt w/ iron-mang. nodules and iron staining, moist, slightly stiff
20	260						
25							

Geoprobe: 007G37L1
Elev.: 280.94



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BORING LOG of 007G37L2

NSA MIDSOUTH
Millington, TN.

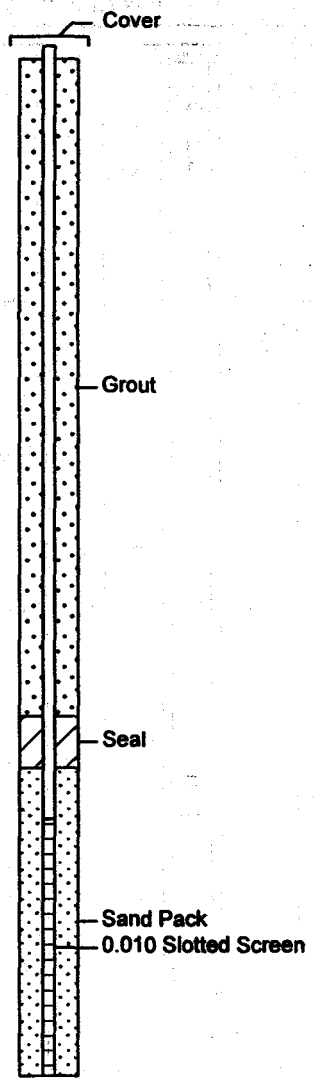
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1000 7/20/99	Northing	: 393715.55
Finished	: 1130 7/20/99	Easting	: 812546.55
Drilling Method	: Rotasonic	TOC Elevation	: 280.22
Drilling Company	: Allinance Drilling	Total Depth	: 40 feet
Geologist	: C. Davis	Well Screen	: 30 to 40 feet

Geoprobe: 007G37L2
Elev.: 280.82

Depth in Feet	Surf. Elev. 280.82	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	280	1	100			ML	(0 - 5) Lt. to med. brown slighty clayey silt w/ some mottled lt. gray silt and clay pebbles, slighty moist, stiff
5	275	2	80			ML	(5 - 8) Greenish gray to med. gray clayey silt w/ some iron staining, slighty moist to moist, stiff
10	270					ML	(8 - 15) Lt. brown and greenish gray mottled clayey silt w/ some iron-manganese nodules, moist, sightly stiff (15 - 22.5) Lt. brown and greenish gray mottled clayey silt (increasing clay content) w/ some iron-manganese nodules, moist, sightly stiff
15	265	3	100				
20	260					ML	(22.5 - 25) Olive gray very clayey silt w/ some iron staining, moist, pliable (25 - 31.5) Olive gray clayey silt motted w/ iron staining (increasing with depth), slighty moist, stiff
25	255	4	100				
30	250					ML	(31.5 - 33) Lt. gray and yellowish orange mottled clayey silt, slighty moist, stiff (33 - 35) Lt. gray and yellowish orange mottled clayey silt, slighty moist, very stiff
35	245	5	100			ML	(35 - 38) Olive gray and Lt. brown mottled clayey silt, slighty moist, stiff
40	240					ML	(38 - 40) Lt. gray clayey silt mottled w Lt/ brown clayey silt, slightly moist to moist, stiff
45	235						
50							



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BORING LOG of 007G37UC

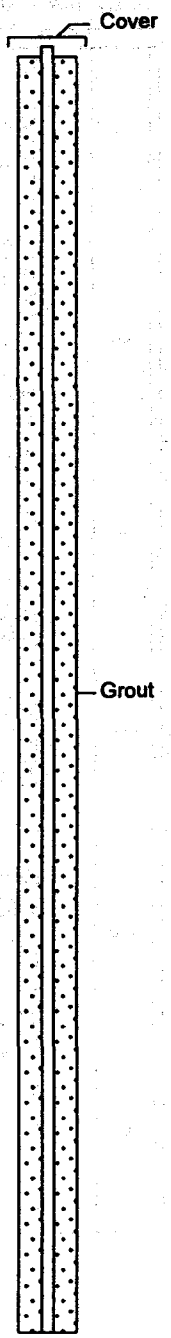
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1630 7/12/99	Northing	: 393736.90
Finished	: 1440 7/13/99	Easting	: 812568.19
Drilling Method	: Rotasonic	TOC Elevation	: 280.42
Drilling Company	: Allinance Drilling	Total Depth	: 125 feet
Geologist	: B. Brantley	Well Screen	: 115 to 125 feet

Depth in Feet	Surf. Elev. 281.07	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	281						
		1	80			ML	(0 - 2) Lt. brown clayey silt, moist (2 - 5) Lt. brown clayey silt, dry, hard
5	276						(5 - 7) Yellowish brown and greenish gray clayey silt, moist, soft to med. stiff
10	271	2	80				(7 - 16) Yellowish brown and greenish gray clayey silt w/ manganese and iron stains, moist, soft to med. stiff (16 - 21) Yellowish brown and greenish gray clayey silt, moist, soft to med. stiff
15	266						(21 - 25) Lt. olive gray clayey silt w/ iron sttaining, moist, med. stiff
20	261	3	100				(25 - 35) Olive gray silt w/ rusty brown streaks, moist, very stiff (35 - 37) Lt. brown yellowish orange greenish gray clayey silt, moist, very stiff manganese streaks at 36
25	256						
30	251	4	100				
35	246						
40	241	5	100			CL	(37 - 41) Lt. brown silty clay w/ Lt. gray streaks, moist, very stiff (41 - 50) Lt. brown sandy clay w/ Lt. gray streaks (sand increases with depth), moist, very stiff
45	236						
50	231	6	100			SC	(50 - 51.5) Lt. grayish tan clayey sand, wet
						SW	(51.5 - 55.5) Reddish brown to Lt. brown med. to coarse sand w/ gravel (up to 2" dia.)
55	226					SP	(55.5 - 57.5) Yellowish brown (tan) fine grained sand
60	221	7	80			SW	(57.5 - 65) Yellowish brown (tan) med. to coarse grained sand w/ gravel (up to 1/2" dia.) (65 - 69) Yellowish brown (tan) med. to coarse grained sand w/ gravel (increases content and size with depth)
65							

Geoprobe: 007G37UC
Elev.: 281.07



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ENSAFE

BORING LOG of 007G37UC

NSA MIDSOUTH
Millington, TN.

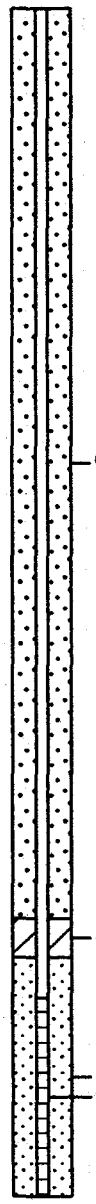
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1630 7/12/99	Northing	: 393736.90
Finished	: 1440 7/13/99	Easting	: 812568.19
Drilling Method	: Rotasonic	TOC Elevation	: 280.42
Drilling Company	: Allinance Drilling	Total Depth	: 125 feet
Geologist	: B. Brantley	Well Screen	: 115 to 125 feet

Geoprobe: 007G37UC
Elev.: 281.07

Depth in Feet	Surf. Elev. 281.07	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
65	216					SW	
70	211	8	90			SP	(69 - 71) Tan fine sand
						SW	(71 - 75) Tan fine to coarse sand w/ gravel
75	206					GW	(75 - 85) Lt. brown sandy gravel (up to 2" dia.) (85 - 90) Lt. brown sandy gravel w/ increase in sand contents and less gravel (up to 2" dia.) (90 - 94) Lt. brown sandy gravel (up to 2" dia.)
80	201	9	80				
85	196						
90	191	10	100				
95	186					SC	(94 - 95) Drak gray olive gray clayey fine sand w/ lignite lenses throughout, moist
						CL	(95 - 99) Olive gray sandy clay, moist, very stiff to hard (thin lignitite laminations (< 1mm)
100	181	11	100			SC	(99 -102) Olive gray clayey sand, stiff
						CL	(102 - 107) Olive gray greenish gray clay w/ sand laminations (up to 1/2" thick), dry, very hard
105	176						
						SC	(107 - 109) Olive gray sandy lignitic clay, moist, stiff to hard
110	171	12	100			CL	(109 - 114) Olive gray clay, dry, hard
115	166					SP	(114 - 114.5) Lt. gray fine sand
						CL	(114.5 - 116) Olive gray clay, dry, hard Lignite layer (4" thick) at 115
120	161	13	100			SP	(116 - 125) Lt. gray very fine sand w/ clayey zones (1 - 3" thick) at 119 and 120
125	156						
130							



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BORING LOG of 007G38LF

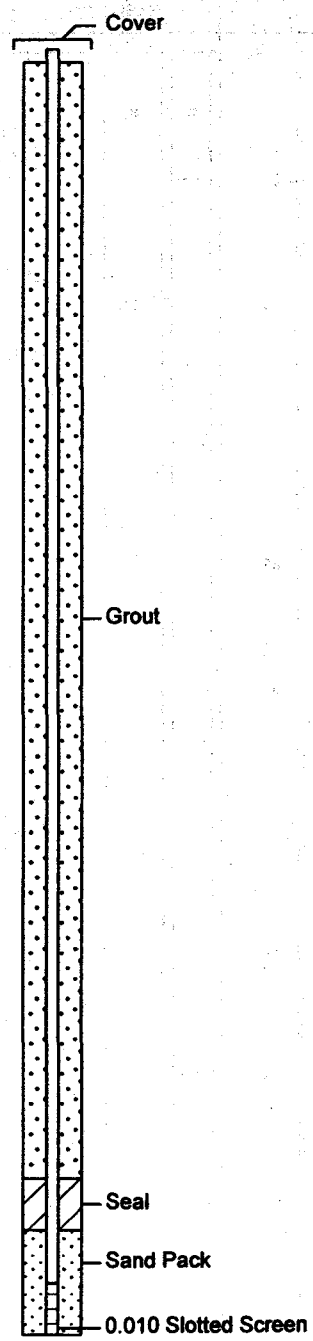
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1030 2/3/99	Northing	: 393399.15
Finished	: 1600 2/3/99	Easting	: 812593.25
Drilling Method	: Rotasonic	TOC Elevation	: 279.96
Drilling Company	: Allinance Drilling	Total Depth	: 88 feet
Geologist	: B. Brantley	Well Screen	: 48 to 88 feet

Geoprobe: 007G38LF
Elev.: 280.12

Depth in Feet	Surf. Elev. 280.12	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	280						(0 - 5) Brown clayey silt, moist, very stiff
		1	100				(5 - 13) Lt. brown clayey silt, moist, med. stiff
5	275						(13 - 15) Lt. brown clayey silt w/ greenish gray mottling and trace of manganese grains, moist, med. stiff
							(13 - 21) Lt. brown clayey silt w/ greenish gray mottling and trace of manganese grains, wet at 18 feet, med. stiff
10	270	2	100				(21 - 27) Drak gaey clayey silt, wet, soft
							(27 - 33) Greenish gray w/ olive gray clayey silt, moist, med. stiff
15	265						(33 - 35) Tan brown w/ greenish gray clayey silt, dry, stiff
							(35 - 41) Dark brown w/ gray clayey silt, dry, stiff
20	260	3	100			ML	
25	255						
30	250	4	100				
35	245						
40	240	5	100				
						CL	(41 - 45) Orange brown w/ grey silty clay, trace of pebbles (1/8" to 1/4"), moist, stiff
45	235						(45 - 51) Yellow brown clayey med. coarse sand w/ gravel (up to 2"), wet
		6	90			SW	(51 - 53) Yellow brown fine coarse sand w/ gravel, wet
50							



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BORING LOG of 007G38LF

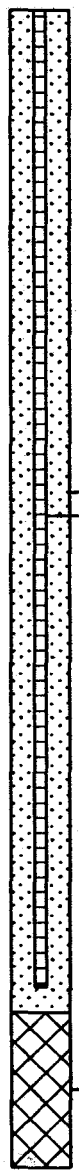
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1030 2/3/99	Northing	: 393399.15
Finished	: 1600 2/3/99	Easting	: 812593.25
Drilling Method	: Rotasonic	TOC Elevation	: 279.96
Drilling Company	: Allinance Drilling	Total Depth	: 88 feet
Geologist	: B. Brantley	Well Screen	: 48 to 88 feet

Geoprobe: 007G38LF
Elev.: 280.12

Depth in Feet	Surf. Elev. 280.12	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	230						
		6	90			SW	
						SP	(53 - 54) Tan brown w/ pink streaks silty fine sand
						CH	(54 - 54.5) Pink fat clay, moist, soft
55	225					SP	(54.5 - 58) Orange brown fine to med. sand, wet
						CH	(58 - 59) Pink fat clay, moist, med. stiff
60	220	7	100			SP	(59 - 62) Yellow brown w/ Lt. gray and pink clayey fine sand
							(62 - 65) Yellow brown and tan brown fine coarse sand w/ gravel (up to 3/4"), wet
65	215						(65 - 74) Tan med coarse sand w/ gravel (up to 3/4"), wet
						SW	
70	210	8	100				
75	205						(74 - 85) Orange brown med. coarse sandy gravel (up to 2")
80	200	9	100			GW	
85	195						(85 - 88) Orange brown med coarse sand w/ gravel
						SW	
90	190	10	90			OL	(88 - 95) Dark brown clayey silt w/ fine sand stringers and lignite throughout, moist, very stiff
95	185						
100							



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BORING LOG of 007G39LF

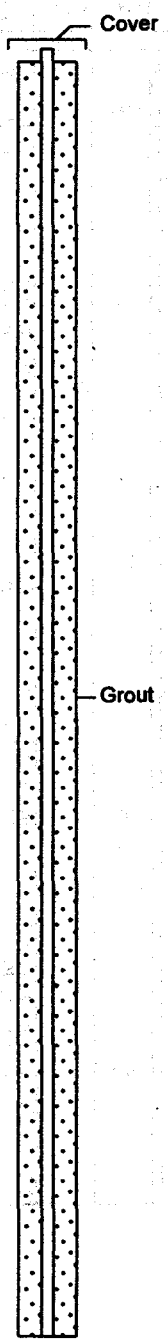
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1030 2/4/99	Northing	: 394136.80
Finished	: 1030 2/5/99	Easting	: 813257.86
Drilling Method	: Rotasonic	TOC Elevation	: 284.91
Drilling Company	: Allinance Drilling	Total Depth	: 94 feet
Geologist	: B. Brantley	Well Screen	: 54 to 94 feet

Depth in Feet	Surf. Elev. 285.23	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	285						(0 - 12) Dark brown clayey silt, moist, med. stiff
		1	80				(12 - 17) Dark brown and greenish gray clayey silt w/ manganese scattered throughout, moist, med. stiff
5	280						(17 - 21) Dark brown clayey silt, moist, stiff
							(21 - 25) Lt. brown and greenish gray clayey silt, wet (moist from 23 - 25), soft
10	275	2	100				(25 - 30) Lt. brown and greenish gray clayey silt w/ trace of manganese, moist, med. stiff
							(30 - 33) Dark brown clayey silt, moist, soft
15	270					ML	
20	265	3	100				
25	260						
30	255	4	100				
							(33 - 37) Lt. brown (tan) silty sand, moist, soft
35	250						(37 - 45) Orange brown w/ gray silty sand, moist
							(45 - 51) Tan and orange brown fine sand, wet, micaceous
40	245	5	100			SP	
45	240						
		6	90				
50							

Geoprobe: 007G39LF
Elev.: 285.23



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BORING LOG of 007G39LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1030 2/4/99	Northing	: 394136.80
Finished	: 1030 2/5/99	Easting	: 813257.86
Drilling Method	: Rotasonic	TOC Elevation	: 284.91
Drilling Company	: Allinance Drilling	Total Depth	: 94 feet
Geologist	: B. Brantley	Well Screen	: 54 to 94 feet

Geoprobe: 007G39LF
Elev.: 285.23

Depth in Feet	Surf. Elev. 285.23	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	235	6	90			SP	
						SW	(51 - 53) Lt. gray fine and med. sand w/ gravel scattered (up to 1/2"), wet
							(53 - 57) Orange brown fine to med sand w/ few gravel
55	230						(57 - 61) Orange brown fine sand
						SP	
60	225	7	100				
							(61 - 65) Tan orange brown gravelly fine coarse sand
							(65 -71) Tan orange brown gravelly fine coarse sand w/ traces of thin (1/2") clay lenses and gravel (up to 2")
65	220					SW	
70	215	8	100				
							(71 - 77) Orange brown med. sand w/ trace of gravel
						SP	
75	210						
						GW	(77 - 80) Tan and orange brown sandy gravel
80	205	9	100				(80 - 86) Orange brown fine and coarse sand w/ trace of gravel
						SW	
85	200						
							(86 - 94) Tan med and coarse sandy gravel (gravel up to 2")
90	195	10	100			GW	
95	190					SC	(94 - 95) Drak brown clayey fine sand
100							

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BORING LOG of 007G40LF

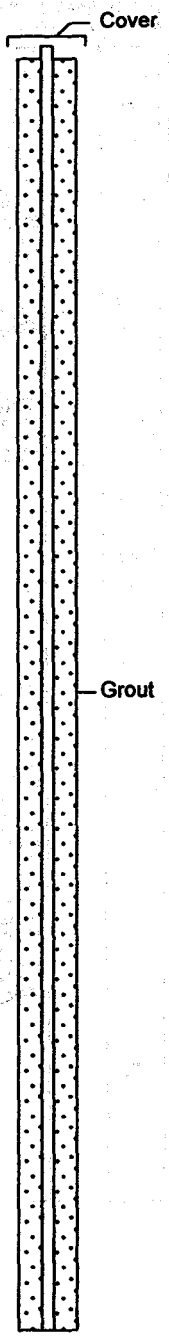
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1030 2/3/99	Northing	: 393203.88
Finished	: 1600 2/3/99	Easting	: 812442.18
Drilling Method	: Rotasonic	TOC Elevation	: 279.03
Drilling Company	: Allinance Drilling	Total Depth	: 87 feet
Geologist	: B. Brantley	Well Screen	: 57 to 87 feet

Depth in Feet	Surf. Elev. 279.21	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	279						(0 - 6) Brown clayey silt, dry, very stiff
		1	100				(6 - 22) Olive gray w/ brown clayey silt, moist, stiff At 18 becomes wet and soft
5	274						(22 - 25) Olive to dark gray clayey silt, wet, soft
10	269	2	100			ML	
15	264						
20	259	3	100				
25	254					CL	(25 - 29) Greenish gray silty clay, moist, stiff
30	249	4	90			ML	(29 - 35) Brown w/ gray clayey silt, dry, very stiff (35 - 40) Brown w/ gray clayey silt w/ trace of sand, moist, med. stiff
35	244						
40	239	5	100			SC	(40 - 45) Orange brown w/ gray sandy clay, moist, med. stiff (45 - 47) Orange brown w/ gray sandy clay, dry, very stiff
45	234	6	90			SP	(47 - 49) Orange brown fine sand w/ trace of gravel, moist
50						CL	

Geoprobe:
Elev.:



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BORING LOG of 007G40LF

NSA MIDSOUTH
Millington, TN.

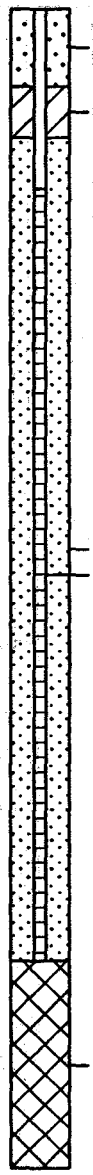
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1030 2/3/99	Northing	: 393203.88
Finished	: 1600 2/3/99	Easting	: 812442.18
Drilling Method	: Rotasonic	TOC Elevation	: 279.03
Drilling Company	: Allinance Drilling	Total Depth	: 87 feet
Geologist	: B. Brantley	Well Screen	: 57 to 87 feet

Depth in Feet	Surf. Elev. 279.21	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	229	6	90			CL	(49 - 55.5) Orange brown w/ Lt. gray sandy clay, moist, med. stiff
55	224					SC	(55.5 - 56) Pink clay lense
						SP	(56 - 57) Tan fine sand, moist
						SC	(57 - 58) Pink and Lt. gray clay, moist, soft
60	219	7	100				(58 - 61) Pink and Lt. gray and orange brown sandy clay
						SP	(61 - 64) Tan and Lt. brown fine sand, moist
65	214					GP	(64 - 66) Tan brown med. to coarse sandy gravel (gravel up to 1")
						SW	(66 - 75) Tan brown med. to coarse sand w/ gravel (up to 1")
70	209	8	100				(73 - 75) increasingly coarser sands and gravelly
75	204					GW	(75 - 84) Orange brown coarse sandy gravel (gravel up to 2")
80	199	9	100				
85	194					GP	(84 - 87) Chert gravel (avg. size between 1/4" and 1/2"), poorly graded
90	189	10	100			OL	(87 - 95) Dark brown clay w/ fine sand (contents varies from stringers to none, predominately clay) , moist, stiff to very stiff
95	184						
100							

Geoprobe:
Elev.:



ENSAFE

BORING LOG of 007G41LF

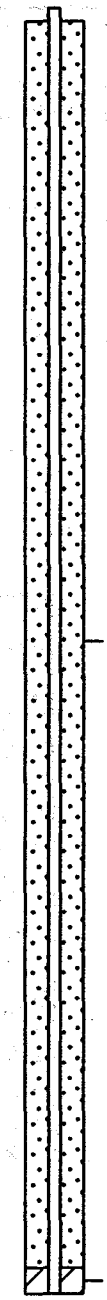
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0915 2/7/99	Northing	: 393876.47
Finished	: 1200 2/7/99	Easting	: 812367.69
Drilling Method	: Rotasonic	TOC Elevation	: 281.89
Drilling Company	: Allinance Drilling	Total Depth	: 93 feet
Geologist	: B. Brantley	Well Screen	: 53 to 93 feet

Depth in Feet	Surf. Elev. 279.45	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	279	1	80			ML	(0 - 4) Lt. brown clayey silt, dry, very stiff
5	274						(4 - 15) Orange brown and Lt. gray clayey silt w/ manganese scattered througout, moist, stiff
							(15 - 18) Orange brown and Lt. gray clayey silt w/ manganese scattered througout, wet, stiff
10	269	2	85				(18 - 24) Tan brown clayey silt w/ iron stains throughout, wet, med. stiff.
							(24 - 31) Dark olive gray clayey silt, moist, med. stiff
15	264						(31 - 34) Brown gray and olive gray clayey silt, dry, very stiff
20	259	3	100				
25	254						
30	249	4	85				
35	244					CL / ML	(34 - 34.5) Greenish gray fat clay lense, moist, soft
							(34.5 - 35) Brown gray and olive gray clayey silt, dry, very stiff
						SC	(35 - 42) Lt. brown and Lt. gray sandy clay, moist, soft
40	239	5	100				(42 -47) Orange brown clayey sand w/ gravel, moist
45	234						
		6	100			SP	(47 - 52) Orange brown med. coarse sand, wet
50							(52 - 54) Tan brown med. coarse sand, wet

Geoprobe: 007G41LF
Elev.: 281.89



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ENSAFE

BORING LOG of 007G41LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0915 2/7/99	Northing	: 393876.47
Finished	: 1200 2/7/99	Easting	: 812367.69
Drilling Method	: Rotasonic	TOC Elevation	: 281.89
Drilling Company	: Allinance Drilling	Total Depth	: 93 feet
Geologist	: B. Brantley	Well Screen	: 53 to 93 feet

Depth in Feet	Surf. Elev. 279.45	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	229	6	100			SP	
55	224						(54 - 63) Tan brown med. and coarse sand w/ small gravel (1/4" dia.)
							(63 - 73) Tan brown med. and coarse sand w/ increasing gravel contents (up to 1" dia.)
60	219	7	100			SW	
65	214						
70	209	8	85				
						SP	(73 - 75) Orange brown coarse sand w/ gravel (up to 1/2" dia.)
75	204						(75 - 86) Orange brown med. and coarse sandy gravel (1/4" to 1" dia. gravel), wet
80	199	9	100			GW	
85	194						
						SW	(86 - 89) Orange brown med. and coarse sand
90	189	10	100			GP	(89 -90.5) Orange brown chest gravel (little to no fines and gravel up to 1" dia.)
						GW	(90.5 - 92.5) Orange brown med. to coarse sandy gravel
						CH	(92.5 - 94) Lt. brown clay (lean), very stiff (94 - 95) Dark gray clay, very stiff
95	184						
100							

Geoprobe: 007G41LF
Elev.: 281.89

ENSAFE

BORING LOG of 007G42LF

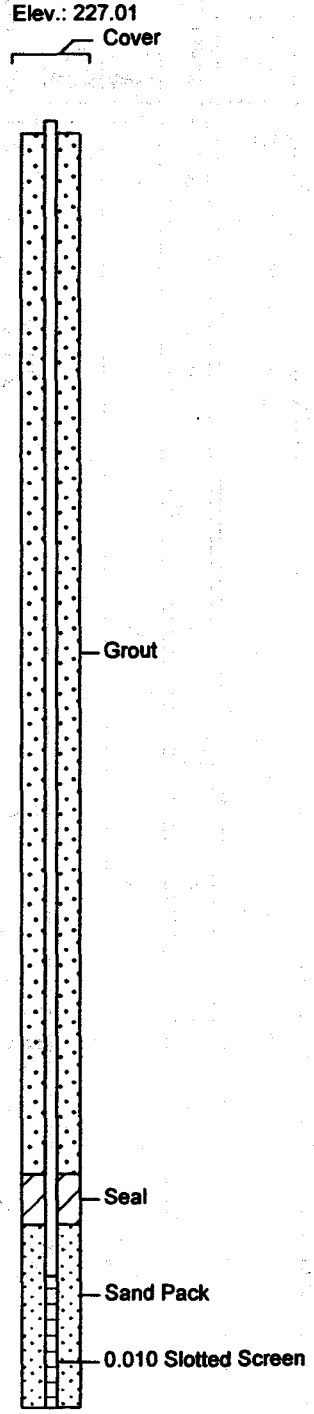
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1500 2/9/99	Northing	: 394573.25
Finished	: 1800 2/9/99	Easting	: 811564.88
Drilling Method	: Rotasonic	TOC Elevation	: 277.01
Drilling Company	: Allinance Drilling	Total Depth	: 88 feet
Geologist	: B. Brantley	Well Screen	: 45 to 85 feet

Depth in Feet	Surf. Elev. 274.91	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	274	1	80			ML	(0 - 2) Dark brown clayey silt, moist, stiff (2 - 9) Lt. gray w/ orange brown clayey silt w/ manganese inclusions throughout, moist, very stiff
5	269						(9- 15) Tan brown w/ orange brown streaks clayey silt, wet, med. stiff (fewer manganese inclusions)
							(15 - 19) Dark brown clayey silt, wet, soft
10	264	2	100				(19 - 25) Olive grey and greenish gray clayey silt, moist, stiff (increasingly stiff and dry with depth) (25 - 28) Olive gray and greenish gray clayey silt, dry, stiff
15	259						(28 - 33) Lt. brown clayey silt, moist,soft (33 - 36) Lt. brown clayey silt w/ clay (gray and soft) stringers, moist, soft
20	254	3	80				
25	249						
30	244	4	100				
35	239						
40	234	5	100			SC	(36 - 43) Lt. brown w/ orange brown and Lt. gray sandy clay, moist, stiff to soft (varies)
						SP	(43 - 44.5) Gray and orange brown silty fine sand w/ gravel (up to 1/2" dia.), wet
45	229					SW	(44.5 - 45) Orange brown fine to coarse sand w/ gravel
		6	85			GW	(45 - 51) Orange brown coarse sandy gravel (gravel between 1/4" - 1"), wet
50							

Geoprobe: 007G42LF
Elev.: 227.01



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BORING LOG of 007G42LF

NSA MIDSOUTH
Millington, TN.

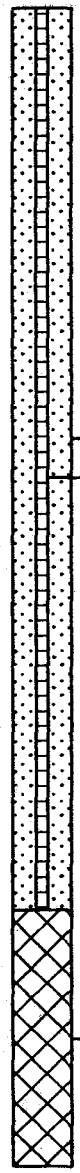
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1500 2/9/99	Northing	: 394573.25
Finished	: 1800 2/9/99	Easting	: 811564.88
Drilling Method	: Rotasonic	TOC Elevation	: 277.01
Drilling Company	: Allinance Drilling	Total Depth	: 88 feet
Geologist	: B. Brantley	Well Screen	: 45 to 85 feet

Geoprobe: 007G42LF
Elev.: 227.01

Depth in Feet	Surf. Elev. 274.91	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	224	6	85			GW	(51 - 58) Orange brown fine sand, moist
55	219					SP	
60	214	7	100			SW SP	(58 - 59) Orange brownmed. to coarse sand w/ gravel (up to 1" dia.), wet (59 - 60) Orange brown fine sand w/ gravel, wet (60 - 65) Orange brown med. coarse sand w/ gravel (up to 2" dia.), wet
65	209					SW	(65 - 77) Reddish brown med. coarse sand w/ gravel, wet
70	204	8	90				
75	199						
80	194	9	100			GW	(77 - 86) Orange reddish brown sandy gravel (up to 2"),wet
85	189					SC	(86 - 91) Olive gray sandy clay, moist to wet, very stiff (lignitic between 90-91)
90	184	10	100			CH	Olive gray lean clay, dry, hard
95	179						
100							



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BORING LOG of 007G43LF

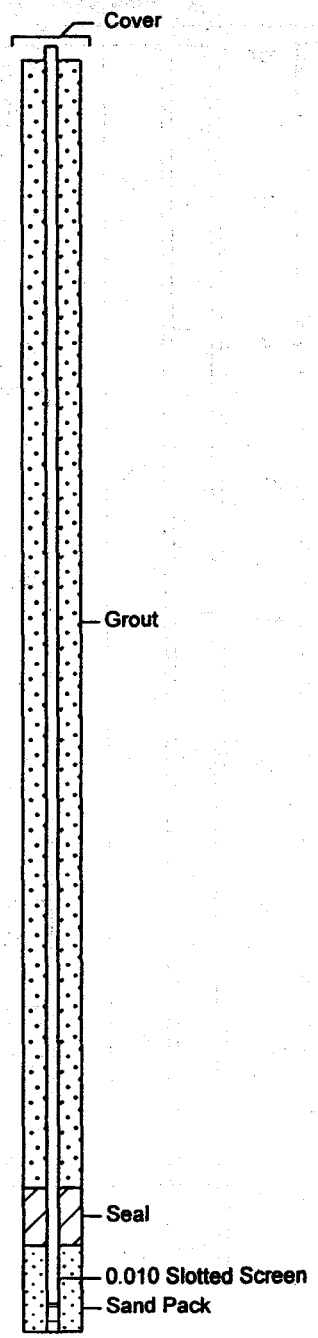
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1020 2/16/99	Northing	: 393011.20
Finished	: 1500 2/16/99	Easting	: 812282.54
Drilling Method	: Rotasonic	TOC Elevation	: 277.25
Drilling Company	: Allinance Drilling	Total Depth	: 84 feet
Geologist	: B. Brantley	Well Screen	: 44 to 84 feet

Geoprobe: 007G43LF
Elev.: 277.25

Depth in Feet	Surf. Elev. 277.51	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	277						(0 - 5) Lt. brown clayey silt, moist, very stiff
		1	100				(5 - 7) Lt. brown clayey silt, increasingly moist, med. stiff
5	272						(7 - 10) Dark brown and olive gray clayey silt, dry, very stiff
							(10 - 12) Dark brown mixed w/ greenish gray clayey silt, dry, stiff
							(12 - 15) Greenish gray w/ yellowish brown clayey silt
10	267	2	90				(15 - 22) Yellow brown w/ Lt. gray clayey silt w/ manganese and iron staining from 20 - 22, wet, soft
							(22 - 25) Dark brown clayey silt, moist, soft
15	262						(25 - 27) Olive gray clayey silt, moist, med. stiff
						ML	(27 - 33) Lt. gray w/ greenish gray and yellowish brown clayey silt, moist, med. stiff, manganese inclusions from 32 -33
20	257	3	100				
25	252						
30	247	4	100				
							(33 -35) Lt. brown w/ Lt. gray silty clay w/ manganese, dry, hard
35	242						(35 - 44) Yellowish brown w/ Lt. gray silty clay, moist, med. stiff
						CL	
40	237	5	100				
						SC	
45							



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BORING LOG of 007G43LF

NSA MIDSOUTH
Millington, TN.

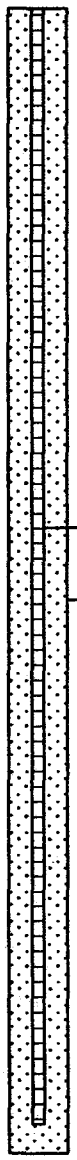
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1020 2/16/99	Northing	: 393011.20
Finished	: 1500 2/16/99	Easting	: 812282.54
Drilling Method	: Rotasonic	TOC Elevation	: 277.25
Drilling Company	: Allinance Drilling	Total Depth	: 84 feet
Geologist	: B. Brantley	Well Screen	: 44 to 84 feet

Geoprobe: 007G43LF
Elev.: 277.25

Depth in Feet	Surf. Elev. 277.51	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
45	232					SC	(44 - 47) Yellowish brown and Lt. gray sandy clay, moist, med. stiff clay, moist (47 - 49) Yellowish brown and Lt. gray sandy clay, wet, soft
50	227	6	100			SP	(49 - 51) Lt.gray fine sand w/ trace of gravel (1/4" dia.), wet
						GW	(51 - 56) Orange brown and tan med to coarse sandy gravel (1/4" - 1 1/2" dia.), wet
55	222					CH	(56 - 57) Pinkish gray fat clay, moist , soft
						SP	(57 - 64) Tan brown fine sand, wet
60	217	7	100				
65	212					SW	(64 - 70) Orange brown gravelly med. to coarse sand, wet (70 - 75) Tan brown gravelly med. to coarse sand, wet (75 - 84) Lt. brown (tan) sandy gravel
70	207	8	100				
75	202					GW	(84 - 85) Dark brown clayw/ Lt. gray lenses and fine sand, moist, med. stiff
80	197	9	100				
85	192					OH	
90		10	100				



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BORING LOG of 007G44LF

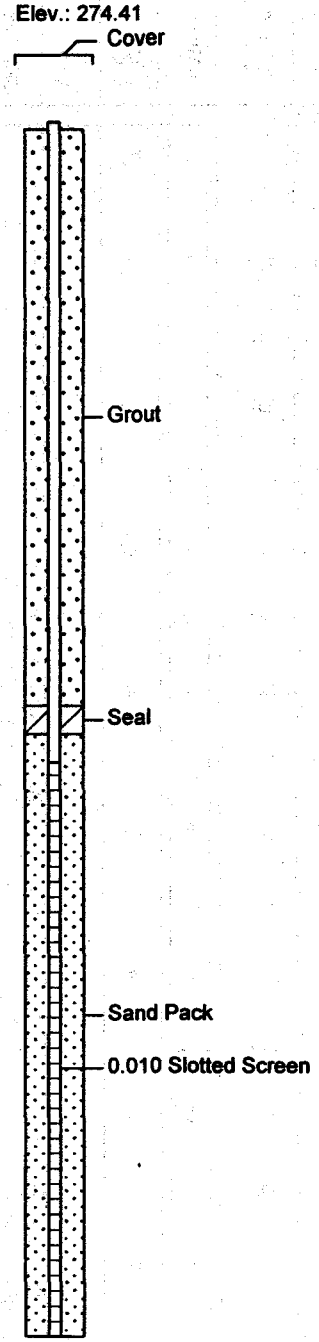
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1100 2/17/99	Northing	: 394206.64
Finished	: 1600 2/17/99	Easting	: 811223.45
Drilling Method	: Rotasonic	TOC Elevation	: 274.41
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: B. Brantley	Well Screen	: 45 to 85 feet

Depth in Feet	Surf. Elev. 274.37	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	274	1	60			ML	(0 - 5) Lt. brown w/ greenish gray clayey silt, wet, stiff
5	269						(5 - 15) Lt. brown w/ greenish gray clayey silt w/ manganese inclusions throughout, wet, med. stiff
10	264	2	65				(15 - 22) Lt. brown w/ greenish gray clayey silt w/ manganese inclusions throughout, wet, soft
15	259						(22 - 28) Greenish gray clayey silt, moist, soft (increasingly stiff with depth)
20	254	3	75				(28 - 33) Olive gray, greenish gray w/ Lt. brown clayey silt, moist, very stiff
25	249						(33 - 35) Lt. brown clayey silt, wet, med. stiff
30	244	4	100				
35	239					SC	(35 - 46.5) Lt. brown w/ Lt. gray clay streaked sandy clay, moist, med. stiff
40	234	5	85				Trace of gravel (1/4" dia.) at 38
45	229						Gravelly clay at 43 - 44
50	224	6	100			SW	(46.5 - 51) Lt. brown med. to coarse sand w/ gravel (up to 1/2"), wet
55	219					SP	(51 - 59) Lt. brown and tan fine sand, micaceous, wet
60	214	7	100			SW	(59 -65) Orange brown gravelly fine to coarse sand, (up to 2" dia. gravel), wet
65	209						(65 - 83) Orange brown gravelly coarse sand, (up to 2" dia. gravel), wet
70	204	8	85				
75	199						
80	194	9	100				
85	189					GW SP	(83 - 84) Orange brown sandy gravel (1/2" to 2" dia.)
		10	100				(84 - 85) Dark gray, olive gray silty fine sand w/ lignite
90							

Geoprobe: 007G44LF
Elev.: 274.41



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BORING LOG of 007G45LF

NSA MIDSOUTH
Millington, TN.

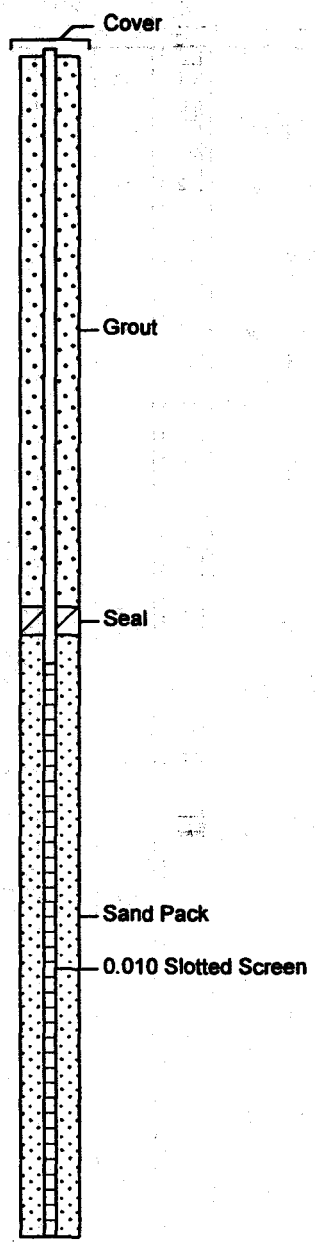
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0020 2/18/99	Northing	: 394931.50
Finished	: 1530 2/18/99	Easting	: 811901.36
Drilling Method	: Rotasonic	TOC Elevation	: 276.90
Drilling Company	: Allinance Drilling	Total Depth	: 83 feet
Geologist	: B. Brantley	Well Screen	: 43 to 83 feet

Depth in Feet	Surf. Elev. 277.07	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	277	1	80			ML	(0 - 5) Lt. brown clayey silt, moist, soft to very stiff
5	272						(5 - 10) Yellow brown w/ Lt. gray streaks clayey silt w/ manganese inclusions, dry, stiff
10	267	2	100				(10 - 15) Yellow brown w/ Lt. gray streaks clayey silt w/ manganese inclusions, wet, soft
15	262						(15 - 20) Lt. gray and yellow brown clayey silt, wet, med. stiff
20	257	3	90				(20 - 22) Grayish brown clayey silt, moist, soft (22 - 29) Greenish gray silt, moist, med. stiff
25	252						(29 - 35) Yellow brown w/ orange brown and Lt. gray streaks clayey silt, moist, med. stiff
30	247	4	100				
35	242					SC	(35 - 40) Yellow brown w/ orange brown and Lt. gray streaks sandy clay w/ trace of gravel, moist, med. stiff to soft
40	237	5	90			GW	(40 - 42) Yellow brown w/ orange brown and Lt. gray streaks sandy clay w/ coarse gravel (2 1/2" dia.), moist, med. stiff to soft
45	232					SW	(42 - 46.5) Orange brown sandy gravel, wet, slightly cemented
50	227	6	85				(46.5 - 47.5) Lt. gray med coarse sand w/ small gravel (< 1/2" dia.), wet
55	222					SP	(47.5 - 56) Tan brown fine sand, wet (56 - 63) Tan brown med. sand w/ trace of chert pebbles, wet
60	217	7	100				
65	212					SW	(63 - 75) Orange brown fine coarse sand w/ trace of gravel (increase in gravel contents with depth), wet 3" thick layer of cemented sands between 74 and 75
70	207	8	100				
75	202					GW	(75 - 82) Yellow orange brown sandy gravel (up to 2" dia.), wet Gravels cemented within a reddish brown iron stone in several places approx. 3" thick
80	197	9	90				
85	192					SC	(82 - 85) Med. gray sandy clay, moist, very stiff
90							

Geoprobe: 007G45LF
Elev.: 277.07



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BORING LOG of 007G46LF

(Page 1 of 1)

NSA MIDSOUTH
Millington, TN.

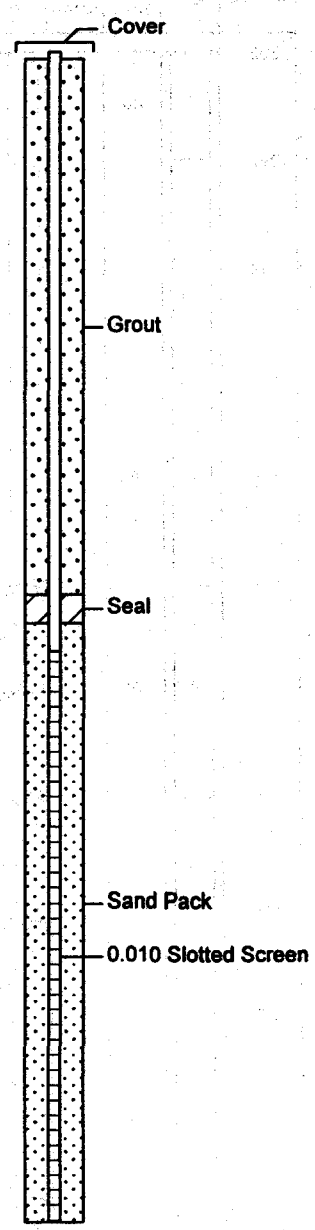
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0915 2/21/99	Northing	: 392830.60
Finished	: 1500 2/21/99	Easting	: 812114.61
Drilling Method	: Rotasonic	TOC Elevation	: 275.92
Drilling Company	: Allinance Drilling	Total Depth	: 82 feet
Geologist	: B. Brantley	Well Screen	: 42 to 82 feet

Depth in Feet	Surf. Elev. 276.21	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	276	1	80			ML	(0 - 6) Lt. brown clayey silt, dry, hard (friable)
5	271						(6 - 10) Greenish gray silt, moist, soft
10	266	2	100				(10 - 16) Olive brown clayey silt w/ orange brown streaks, moist, stiff
15	261						(16 - 22) Greenish gray and orange brown streak clayey silt, wet, med. stiff to stiff
20	256	3	100				(22 - 27) Dark brown clayey silt, moist, soft to med. stiff
25	251						
30	246	4	100			CL	(27 - 35) Yellow brown and Lt. gray silt clay, moist, med. stiff and stiff
35	241						(35 - 41) Lt. brown w/ Lt. gray silt clay
40	236	5	100				
45	231					SC	(41 - 46) Yellowish brown sandy clay
50	226	6	100			SW	(46 - 54)Orange brown gravelly poorly sorted sand, wet
55	221					SW / SP	(54 - 54.5) Orange brown sandy gravel (up to 2" dia.), wet
60	216	7	100				(54.5 - 55) Orange brown med. sand. (55 - 57) Lt. gray fine sand, wet
65	211					SW	(57 - 62) Orange brown med. sand, wet
70	206	8	90				(62 - 65) Orange brown med. sand w/ gravel (up to 1" dia.), wet
75	201						(65 - 68) Orange brown med. sand w/ small gravel (up to 1/4"- 1/2" dia.) (68 - 82) Tan brown coarse sand w/ gravel (up to 2 1/2" dia.)
80	196	9	90				
85	191					OL	(82 - 85) Dark brown clay w/ thin sand lenses scattered at 6" intervals, moist, very stiff
90							

Geoprobe: 007G46LF
Elev.: 276.21



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BORING LOG of 007G47LF

NSA MIDSOUTH
Millington, TN.

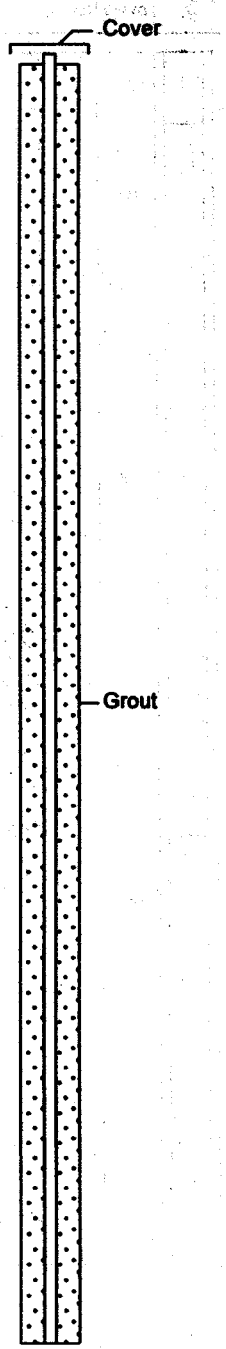
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1100 2/19/99	Northing	: 397855.14
Finished	: 1400 2/20/99	Easting	: 814805.31
Drilling Method	: Rotasonic	TOC Elevation	: 302.04
Drilling Company	: Allinance Drilling	Total Depth	: 82 feet
Geologist	: B. Brantley	Well Screen	: 72 to 82 feet

Geoprobe: 007G47LF
Elev.: 302.04

Depth in Feet	Surf. Elev. 302.22	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	302						
		1	80			ML	(0 - 12) Lt. brown silt, dry hard (12 - 15) Lt. brown silt, moist, soft
5	297						(15 - 20) Lt. brown silt, dry, hard (20 - 23) Lt. brown silt, dry, hard (friable)
10	292	2	80				(23 - 25) Lt. brown silt, moist, med. stiff, trace of sand between 24 and 25
15	287						
20	282	3	100				
25	277					SC	(25 - 30) Orange brown sandy clay, moist, very stiff scattered pebbles (< 5%) between 28 - 30
30	272	4	100			SP	(30 - 35) Reddish brown silty fine sand, wet, no gravel
35	267					SC	(35 - 41) Yellow brown w/ pink and Lt. gray sandy clay, moist, stiff
40	262	5	100			CL	(41 - 53) Pink w/ Lt. gray clay, moist, soft to med. stiff
45	257						
50	252	6	100				
						SC	(53 - 54) Yellow brown sandy clay, moist, med. stiff
						SP	(54 -55) Yellow brown clayey sand w/ iron stones approx. 3" wide and 1/2" thick, wet
55	247	7	100			CH	(55 - 69) Yellow brown w/ pink clay, moist, soft (very plastic)
60							



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BORING LOG of 007G47LF

NSA MIDSOUTH
Millington, TN.

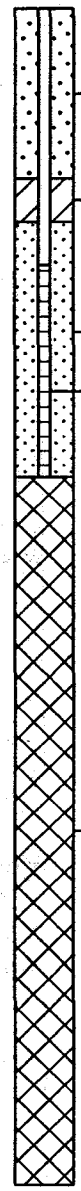
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1100 2/19/99	Northing	: 397855.14
Finished	: 1400 2/20/99	Easting	: 814805.31
Drilling Method	: Rotasonic	TOC Elevation	: 302.04
Drilling Company	: Allinance Drilling	Total Depth	: 82 feet
Geologist	: B. Brantley	Well Screen	: 72 to 82 feet

Geoprobe: 007G47LF
Elev.: 302.04

Depth in Feet	Surf. Elev. 302.22	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
60	242						
		7	100			CH	
65	237						
70	232	8	100			SC	(69 - 72) Pink w/ Lt. gray sandy clay, moist, soft
						SP	(72 - 74.5) Lt. gray clayey sand w/ gravel (1/4" to 1/2"), wet
75	227					GW	(74.5 - 80) Yellow brown sandy gravel (up to 1") w/ clay, moist to wet
80	222	9	100			CL	(80 - 84) Yellow brown silty clay, moist, med. stiff
85	217					SC	(84 - 85) Gray sandy clay, moist, soft (cockfield) (85 - 98) Gray sandy clay, moist to wet, med. stiff to stiff
90	212	10	100				
95	207						
100	202	11	100			SP	(98 - 115) Gray fine sand, wet Lignite lense at 104 (2" thick) and 105 (i/2" thick) Lignite seam at 113 (4" thick)
105	197						
110	192	12	100				
115	187						
120							



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BORING LOG of 007G48LF

NSA MIDSOUTH
Millington, TN.

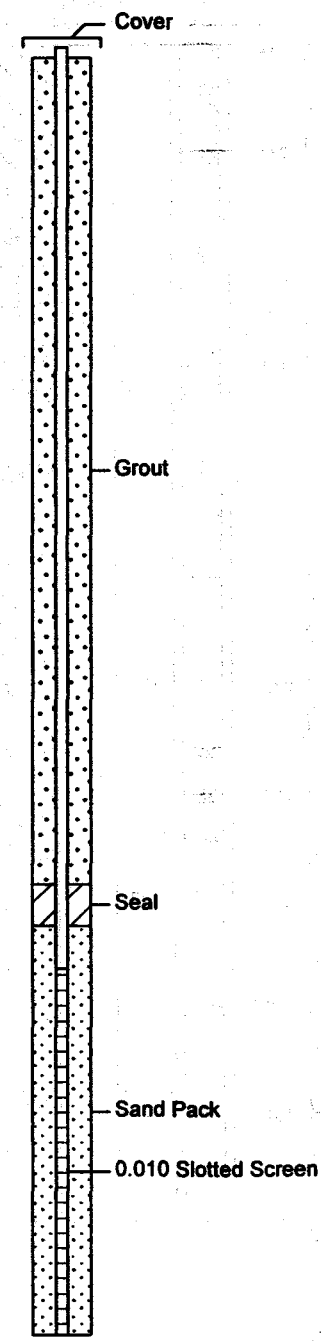
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1615 2/22/99	Northing	: 396174.74
Finished	: 1300 2/23/99	Easting	: 812942.06
Drilling Method	: Rotasonic	TOC Elevation	: 279.71
Drilling Company	: Allinance Drilling	Total Depth	: 113 feet
Geologist	: B. Brantley	Well Screen	: 43 to 113 feet

Geoprobe: 007G48LF
Elev.: 279.71

Depth in Feet	Surf. Elev. 279.89	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	279	1	100			ML	(0 - 3) Lt. brown clayey silt, dry, hard (3 - 5) Lt. brown clayey silt, wet, soft (5 - 9) Gray clayey silt, wet, very soft (9 - 16) Olive grey yellowish brown w/ minor orange brown clayey silt, wet, soft (16 - 26) Dark gray to olive gray clayey silt, wet, soft
5	274						
10	269	2	95				
15	264						
20	259	3	80				
25	254					CL	(26 - 29) Greenish gray silty clay, moist, very stiff trace of pebbles at 25 (29 - 36) Olive gray silty clay w/ scattered pebbles, moist, very stiff
30	249	4	90				
35	244					SC	(36 - 40) Olive green and greenish gray sandy clay w/ few gravel (< 1/2"), moist, med. stiff
40	239	5	100			GC	(40 - 42) Greenish gray and olive gray clayey gravel w/ sand, moist, very hard (42 - 45) Orange brown clayey gravel w/ sand, moist, very hard
45	234					SP	(45 - 49) Tan brown fine sand, wet 4" thick hard pink clay at 45.5, moist
50	229	6	100			SW	(49 - 65) Orange brown fine coarse sand w/ gravel (up to 1" dia.)
55	224	7	100				
60							



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BORING LOG of 007G48LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1615 2/22/99	Northing	: 396174.74
Finished	: 1300 2/23/99	Easting	: 812942.06
Drilling Method	: Rotasonic	TOC Elevation	: 279.71
Drilling Company	: Allinance Drilling	Total Depth	: 113 feet
Geologist	: B. Brantley	Well Screen	: 43 to 113 feet

Geoprobe: 007G48LF
Elev.: 279.71

Depth in Feet	Surf. Elev. 279.89	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
60	219	7	100			SW	
65	214	8	100			GW	(65 - 71) Orange brown sandy gravel (most gravel < 1" dia.)
70	209					SP	(71 - 77) Tan brown med. sand w/ gravel
75	204	9	100			SW	(77 - 85) Orange brown med. to very coarse sand w/ trace of gravel
80	199						
85	194	10	100			SP	(85 - 87) Orange brown med. sand
						SW	(87 - 95) Orange brown med. to coarse sand w/ trace of gravel Silty at 94 to 95 (95 - 98) Orange brown med. to coarse sand w/ increase of gravel content (98 - 105) Orange brown gravelly sand (105 - 111) Tan brown gravelly sand
90	189						
95	184	11	100				
100	179						
105	174	12	100				
110	169					GW	(111 - 113) Orange brown sandy gravel (up to 2" dia.), wet
						OL	(113 - 115) Dark gray clay, moist, very stiff
115	164						
120							

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BORING LOG of 007G49LF

NSA MIDSOUTH
Millington, TN.

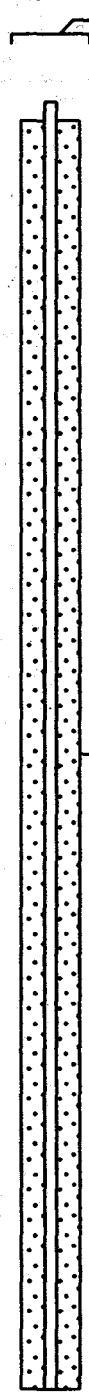
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0950 4/13/99	Northing	: 392931.02
Finished	: 1421 4/13/99	Easting	: 814783.22
Drilling Method	: Rotasonic	TOC Elevation	: 289.68
Drilling Company	: Allinance Drilling	Total Depth	: 98 feet
Geologist	: C. Davis	Well Screen	: 56.5 to 96.5 feet

Depth in Feet	Surf. Elev. 289.98	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0							(0 - .5) Concrete and gravel
	289					ML	(.5 - 4) Dark, orangish brown silt mottled w/ Lt. olive gray silt, some iron staining, moist
		1	40				(4 - 8) No recovery
5	284						
10	279	2	80			ML	(8 - 16) Lt. olive gray silt and clayey silt, mottled w/ orangish brown silt and clayey silt w/ iron staining and nodules, moist
15	274						(16 - 18) No recovery
20	269	3	100			ML	(18 - 24) Same as above, but little to no iron nodules, lots of iron staining and more clay content (24 - 27) Pale orangish Lt. brown to gray clayey silt, moist (27 - 28) Lt. olive gray silt and clayey silt, mottled w/ orangish brown silt and clayey silt w/ iron staining and nodules, moist (28 - 35) Dusky orangish brown clayey to very clayey silt w/ iron staining, moist (35 - 45) Orangish brownand Lt. olive gray mottled clayey to very clayey silt w/ iron staining, moist (45 - 47) Orangish brownand Lt. olive gray mottled clayey to very clayey silt w/ iron staining and minor amounts of very fine sand, moist
25	264						
30		4	100				

Geoprobe: 007G49LF
Elev.: 289.68



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BORING LOG of 007G49LF

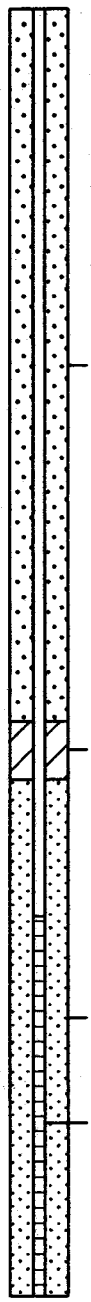
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0950 4/13/99	Northing	: 392931.02
Finished	: 1421 4/13/99	Easting	: 814783.22
Drilling Method	: Rotasonic	TOC Elevation	: 289.68
Drilling Company	: Allinance Drilling	Total Depth	: 98 feet
Geologist	: C. Davis	Well Screen	: 56.5 to 96.5 feet

Geoprobe: 007G49LF
Elev.: 289.68

Depth in Feet	Surf. Elev. 289.98	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
33	256	4	100			ML	
38	251	5	100				
43	246						
48	241	6	100			SW	(47 -48) same mottled colors w/ very fine to fine sand and subangular gravel (up to 1 1/2" dia.) (48 - 51) Same as above, very moist, sand grain to med.
53	236					SC	(51 - 56.5) Alternating Lt. gray and bright orangish brown fine to med. clayey to clean sands, clay lense 2" thick at 54, 3" thick at 55.5, 6" thick from 56 to 56.5, very moist
58	231	7	100			SW	(56.5 - 58) Pale orangish to pale yellowish gray fine to med. sand, wet
						SP	(58 - 62) Pale orangish brown fine sand, wet
63						SC	(62 - 62.5) Red and gray banded to mottled clay, moist (62.5 - 68) Repeat pattern of sand and clay as follows: 62.5-63 is sand, 63- 63.75 is clay, 63.75- 64.5 is sand, 64.5-64.75 is clay, 64.75-66 is sand, 66-66.25 is clay, 66.25-66.5 is sand 66.5-67 is clay, 67-68 is sand



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BORING LOG of 007G49LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0950 4/13/99	Northing	: 392931.02
Finished	: 1421 4/13/99	Easting	: 814783.22
Drilling Method	: Rotasonic	TOC Elevation	: 289.68
Drilling Company	: Allinance Drilling	Total Depth	: 98 feet
Geologist	: C. Davis	Well Screen	: 56.5 to 96.5 feet

Geoprobe: 007G49LF
Elev.: 289.68

Depth in Feet	Surf. Elev. 289.98	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
66	223	7	100			SC	
							(68 - 78) Yellowish gray to Lt. orangish brown fine to med sand w/ occassional very fine gravel, wet, Lt. gray clay, very moist (78 - 86) Same, clay lense at 78.5 (2" thick)
71	218	8	80				
76	213					SW	
81	208	9	100				
86	203						(86 - 88) No recovery
						SP	(88 - 91) Pale orangish gray med. sand, wet (91 - 92) Pale orangish gray med. sand w/ gravel (up to 1 1/2")
91	198	10	100			SW	(92 - 93) Very pale orangish brown med. to very coarse sand w/ gravel
						SP	(93 - 94) Pale orangish gray med. sand w/ gravel (up to 1 1/2"), wet
						SW	(94 - 94.5) Orangish yellow brown med. to very coarse sand w/ gravel (up to 3")
96						CL	(94.5 - 95) Gray to Lt. gray clay moist, some yellowish and orangish gray mottling (95 - 98) Very dark brown silty clay, w/ clayey silt bands, micaceous, moist

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BORING LOG of 007G52LF

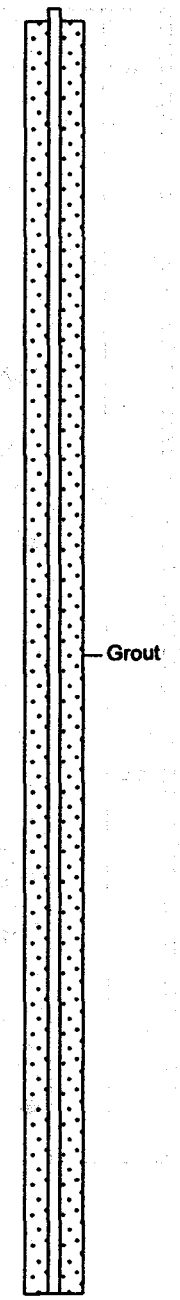
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0805 7/9/99	Northing	: 395738.31
Finished	: 1730 7/9/99	Easting	: 812022.10
Drilling Method	: Rotasonic	TOC Elevation	: 278.20
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: B. Brantley	Well Screen	: 75 to 85 feet

Geoprobe: 007G52LF
Elev.: 278.20

Depth in Feet	Surf. Elev. 275.34	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	275	1	100			ML	(0 - 14) Lt. brown w/ Lt. gray clayey silt, dry, med. stiff (14 - 15) Lt. gray silt, dry, friable (15 - 16.5) Yellowish orange to Lt. brown clayey silt w/ trace of fine sand, moist, med. stiff
5	270						
10	265	2	95				(16.5 - 28) Olive gray and dark gray clayey silt, wet, med. stiff Small gastropods (1mm) between 16.5 and 25 Traces of wood
15	260						
20	255	3	100				
25	250						
30	245	4	100			SM	(28 - 31.5) Olive gray silty sand, wet, med. stiff
						SW	(31.5 - 33.5) Lt. gray to greenish gray fine sand grading to a coarse yellow brown sand, wet
35	240					CL	(33.5 - 35) Olive gray to dark gray sandy clay, wet, soft (35 - 37) Olive gray to dark gray sandy clayw/ trace of gravel (up to 1/4" dia.), wet, med. stiff
40	235	5	100			GC	(37 - 41) Olive gray to Lt. brown clayey sand gravel mixture, wet
						SW	(41 - 44) Lt. grey fine to coarse sand w/ gravel (up to 1/2" dia.), wet (44 - 45) Yellow brown fine to coarse sand w/ gravel (up to 1/2" dia.), wet
45	230	6	85			SP	(45 - 55) Yellow brown fine and med. grained sand w/ trace of gravel (up to 1/2" dia.) (55 - 64) Orange brown fine and med. grained sand w/ trace of gravel (up to 1/2" dia.) Iron stone 1/2" thick at 62
50							



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BORING LOG of 007G52LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 0805 7/9/99	Northing	: 395738.31
Finished	: 1730 7/9/99	Easting	: 812022.10
Drilling Method	: Rotasonic	TOC Elevation	: 278.20
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: B. Brantley	Well Screen	: 75 to 85 feet

Geoprobe: 007G52LF
Elev.: 278.20

Depth in Feet	Surf. Elev. 275.34	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	225						
		6	85				
55	220					SP	
60	215	7	100				
						CH	(64 - 64.5) Tan brown fat clay lense (4" thick), moist, soft
65	210					SP	(64.5 - 67) Orange brown fine and med. grained sand w/ trace of gravel (up to 1/2" dia.)
						GW	(67 -71) Orange brown med. to coarse sandy gravel (up to 2" dia.), wet
70	205	8	100				
						SW	(71 - 75) Orange reddish brown gravelly med. coarse sand, wet
75	200						(75 - 84) Orange brown med. coarse sandy gravel (1/4" to 2" dia.)
80	195	9	100			GW	
						SP	(84 - 85) Yellowish orange brown fine sand
85	190					SC	(85 - 86) Lt. gray clayey fine sand, wet
						SP	(86 - 89) Lt. gray fine sand
90	185	10	100			SC	(89 - 93) Lt. gray clayey sand
						CL	(93 - 95) Olive grey clay, moist, very stiff
95	180						
100							

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BORING LOG of 007G53LF

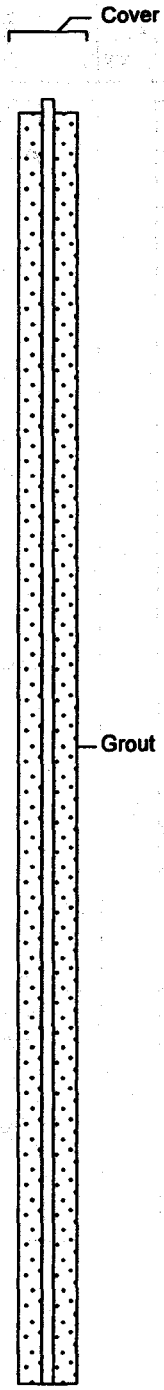
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0820 7/10/99	Northing	: 3961955.38
Finished	: 1400 7/10/99	Easting	: 812124.48
Drilling Method	: Rotasonic	TOC Elevation	: 280.16
Drilling Company	: Allinance Drilling	Total Depth	: 78 feet
Geologist	: B. Brantley	Well Screen	: 68 to 78 feet

Depth in Feet	Surf. Elev. 277.12	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	277	1	90			ML	(0 - 8) Lt. brown clayey silt w/ iron and manganese striations, wet, med. stiff (moist from 3 to 6 and wet from 6 to 8)
							(8 - 15) Lt. gray and yellowish orange brown clayey silt, wet, med. stiff
5	272						(15 - 20.5) Dark gray clayey silt w/ lignitic lenses/seams between 15 and 18, wet, soft
							(20.5 - 26) Dark gray clayey silt, wet, soft
10	267	2	100				
15	262						
20	257	3	55				
25	252					CL	(26 - 28) Greenish gray and dark gray silty clay, moist, stiff
							(28 - 30) Greenish gray and dark gray sandy clay, moist
30	247	4	100			SC	(30 - 33) Olive gray clayey sand w/ trace of pebbles, wet, soft
							(33 - 35) Greenish gray clayey sand, wet, hard
35	242						(35 - 37) Lt. gray, olive gray, yellowish brown, clayey sand
							(37 -39) Lt. gray, olive gray, yellowish brown, clayey sand w/ trace of gravel
40	237	5	100			GC	(39 - 40) Greenish gray and Lt. brown gravelly sand clay
						SC	(40 - 45) Greenish gray, yellowish orange, Lt. gray sandy clay w/ trace of gravel (up to 1/2" dia.), wet, soft to med. stiff
45							

Geoprobe: 007G53LF
Elev.: 280.16



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BORING LOG of 007G53LF

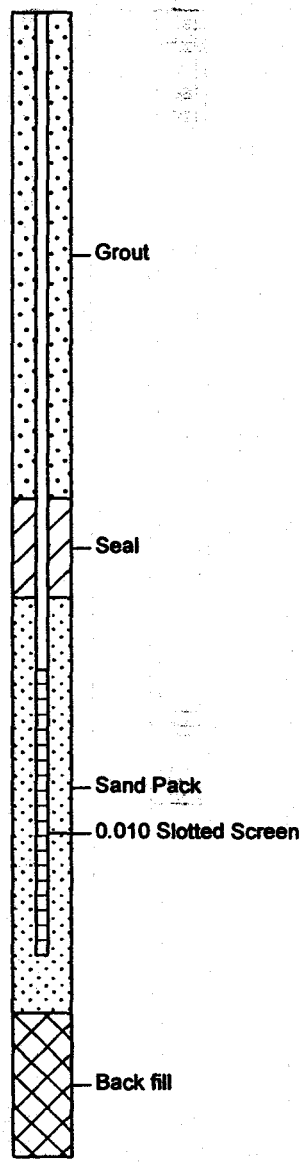
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 0820 7/10/99	Northing	: 3961955.38
Finished	: 1400 7/10/99	Easting	: 812124.48
Drilling Method	: Rotasonic	TOC Elevation	: 280.16
Drilling Company	: Allinance Drilling	Total Depth	: 78 feet
Geologist	: B. Brantley	Well Screen	: 68 to 78 feet

Depth in Feet	Surf. Elev. 277.12	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
45	232					SW	
							(47 - 65) Lt. brown to orange brown fine to med. sand (slightly silty and micaceous) w/ trace of pebbles (increase in gravel contents between 63 and 65)
50	227	6	100				
55	222					SP	
60	217	7	90				
65	212						(65 - 76) Orange brown gravelly med. to coarse sand w/ fines (gravel up to 1" dia.)
70	207	8	80			SW	
75	202					GW	(76 - 77) Orange brown sandy gravel (cherts up to 2" dia.)
						SC	(77 - 78) Orange brown and Lt. gray clayey sand
80	197	9	90			CL	(78 - 81) Dark gray sandy clay w/ wood fragments (78 - 79), moist, very stiff
						SP	(81 - 85) Lt. gray fine sand w/ Lt. olive gray clay lenses scattered throughout
85	192						
90							

Geoprobe: 007G53LF
Elev.: 280.16



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BORING LOG of 007G54LF

NSA MIDSOUTH
Millington, TN.

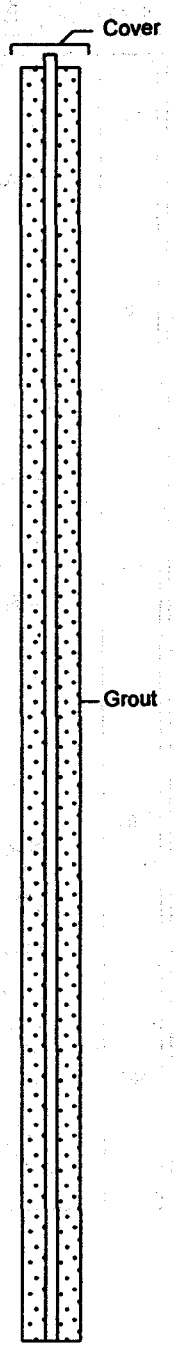
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1415 7/11/99	Northing	: 392837.38
Finished	: 0915 7/12/99	Easting	: 812878.255
Drilling Method	: Rotasonic	TOC Elevation	: 278.64
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: B. Brantley	Well Screen	: 75 to 85 feet

Geoprobe: 007G54LF
Elev.: 278.64

Depth in Feet	Surf. Elev. 278.94	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	278	1	80			ML	(0 - 5) Lt. brown clayey silt w/ manganese inclusions throughout, dry, hard (5 - 10) Lt. brown clayey silt w/ manganese inclusions throughout, moist, very stiff
5	273	2	100				(10 - 15) Lt. brown clayey silt w/ manganese inclusions throughout, wet, med. stiff to soft (15 - 17) Yellowish orange and Lt. gray clayey silt, wet, med. stiff to soft
10	268						(17 - 23) Olive gray to greenish gray clayey silt, wet, soft
15	263	3	95				
20	258					CL	(23 - 25) Dark olive gray silty clay, moist, soft (25 - 32) Greenish gray silty clay, dry, very stiff
25	253	4	100				(32 - 35) Yellowish brown and Lt. brown silty clay w/ manganese striations at 34 - 35, dry, hard (35 - 38) Yellowish brown, Lt. brown and Lt. gray silty clay w/ manganese striations, dry, hard
30	248						(38 - 41) Lt. brown sandy clay, moist, med. stiff
35	243	5	100			SC	(41 - 45) Lt. brown/orange brown and Lt. gray clayey sand, wet (45 - 49) Lt. brown, orange brown and Lt. gray clayey sand w/ trace of gravel (up to 1/4" dia.), wet
40	238						
45	233	6	100			GW	
50							



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BORING LOG of 007G54LF

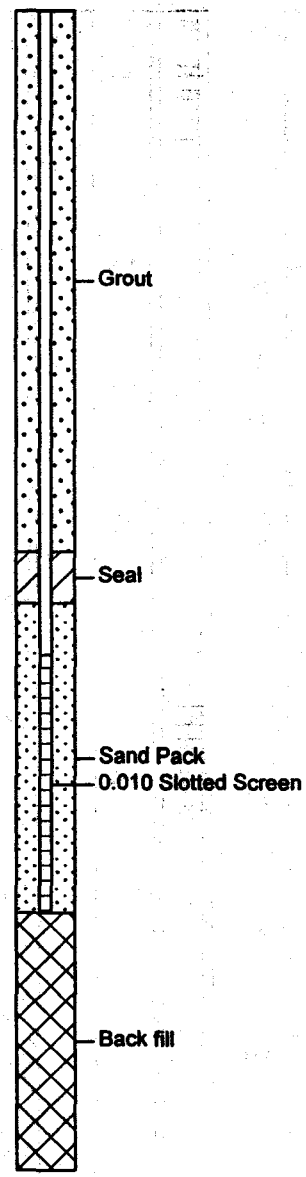
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1415 7/11/99	Northing	: 392837.38
Finished	: 0915 7/12/99	Easting	: 812878.255
Drilling Method	: Rotasonic	TOC Elevation	: 278.64
Drilling Company	: Allinance Drilling	Total Depth	: 85 feet
Geologist	: B. Brantley	Well Screen	: 75 to 85 feet

Geoprobe: 007G54LF
Elev.: 278.64

Depth in Feet	Surf. Elev. 278.94	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
50	228	6	100			GW	(49 - 55) Lt. brown to orange brown sandy gravel
55	223	7	100			SW	(55 - 66.5) Yellowish brown fine to coarse sand w/ trace of gravel
60	218						
65	213	8	100			SP	(66.5 - 68.5) Tan and Lt. gray fine sand (68.5 - 70) Lt. brown med. sand w/ few gravel (70 - 71.5) Yellowish brown fine sand
70	208						(71.5 - 81) Yellow brown coarse gravelly sand w/ fines
75	203	9	100			SW	
80	198					GW	(81 - 85) Yellowish orange to Lt. brown sandy gravel (up to 2" dia.)
85	193	10	100			CL	(85 - 95) Dark brown silty clay w/ Lt. gray sand stringers (5%), moist, hard
90	188						
95	183						
100							



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BORING LOG of 007G55LF

NSA MIDSOUTH
Millington, TN.

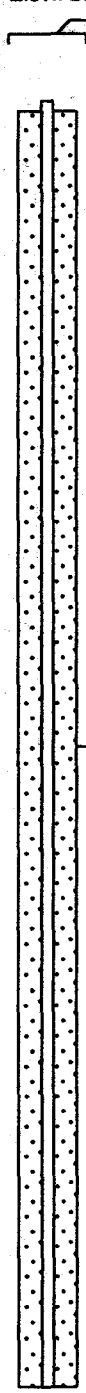
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 15455 7/22/99	Northing	: 398359.55
Finished	: 1200 7/23/99	Easting	: 810649.43
Drilling Method	: Rotasonic	TOC Elevation	: 282.00
Drilling Company	: Allinance Drilling	Total Depth	: 105 feet
Geologist	: C. Davis	Well Screen	: 85 to 105 feet

Depth in Feet	Surf. Elev. 278.76	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	278	1	100			ML	(0 - 5) Lt. brown to med. brown clayey silt, moist, stiff (5 - 15) Lt. brown to med. brown clayey silt w/ less clay content, moist
5	273	2	110				(15 - 25) Lt. brown to med. brown clayey silt w/ iron staining, moist (25 - 29) Lt. brown and Lt. gray mottled very clayey silt w/ iron staining, moist, stiff
10	268						
15	263	3					
20	258						
25	253	4	110			CL	(29 - 32.5) Orangish brown silty clay w/ iron-manganese nodules, moist
30	248					ML	(32.5 - 35) Lt. brown and Lt. gray mottled slighty clayey silt w/ iron-manganese nodules, slighty moist, slighty stiff to friable
35	243	5	100				(35 - 39) Lt. brown and Lt. gray mottled slighty clayey silt w/ iron-manganese nodules, slighty moist, slighty stiff to friable (two areas - 36 and 37.5 are mostly iron nodules and very stained)
40	238					SC	(39 - 40) Lt. gray fine sandy and fine gravelly clayey silt, moist
						SW	(40 - 41) Lt. gray and pale yellowish orange brown clayey silt, moist, med, stiff
45	233						(41 - 42.5) Yellowish orange clayey gravelly sand (up to 1" dia), very moist
50	228	6	100			SP	(42.5 - 45) Yellowish orange brown fine to very coarse sand and fine gravel w/ traces of clay, wet (45 -46) Yellowish orange brown med. to very coarse sand w/ traces of very fine gravel and clay, moist to wet
55	223	7	100				
60							

Geoprobe: 007G55LF
Elev.: 282.00



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BORING LOG of 007G55LF

NSA MIDSOUTH
Millington, TN.

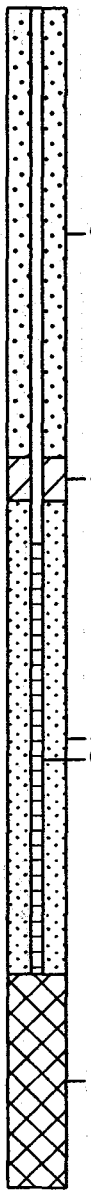
Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 15455 7/22/99	Northing	: 398359.55
Finished	: 1200 7/23/99	Easting	: 810649.43
Drilling Method	: Rotasonic	TOC Elevation	: 282.00
Drilling Company	: Allinance Drilling	Total Depth	: 105 feet
Geologist	: C. Davis	Well Screen	: 85 to 105 feet

Geoprobe: 007G55LF
Elev.: 282.00

Depth in Feet	Surf. Elev. 278.76	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
60	218	7	100			SP	(46 - 48) Lt. gray to pale yellowish gray med. sand w/ traces of fine to very fine gravel, wet (48 - 55) Heavily iron stained sand w/ traces of fine gravel, wet (55 - 63.5) Yellowish orange brown med. sand w/ iron staining and traces of gravel (up to 3/4" dia.), wet (occasional patch of Lt. gray med. sand)
65	213						
70	208	8	100			SW	(63.5 - 65) Yellowish orange brown med. sand and fine gravel mix (up to 1" dia.), wet (65 - 85) Yellowish orange brown med. to very coarse sand and fine to coarse gravel w/ iron staining (gravel up to 3 1/2" dia.), wet
75	203						
80	198	9	100				
85	193	10	20				(85 - 95) Poor recovery Fine to coarse sand, wet 6" layer of gravel (from 1/2" to 2" dia.), wet 4" layer of very clayey med. to coarse sand w/ small gravel, wet Mix of med. to coarse sand and fine to med. gravel w/ traces of clay, wet (95 - 105) No recovery Dark brown fine sandy clay w/ gravel (up to 2 1/2" dia.), grading to 2" layer of pale yellowish brown fine clayey sand, grading to 3-4" gray clayey sand, wet
90	188						
95	183						
100	178	11	0				
105	173					SP	(105 - 108.5) Gray clayey sand w/ mica, wet
110	168	12	100			CL	(108.5 - 113) Gray fine sandy clay, wet (113 - 115) Gray to olive gray clay, moist
115	163						
120							



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ENSAFE

BORING LOG of 007G56LF

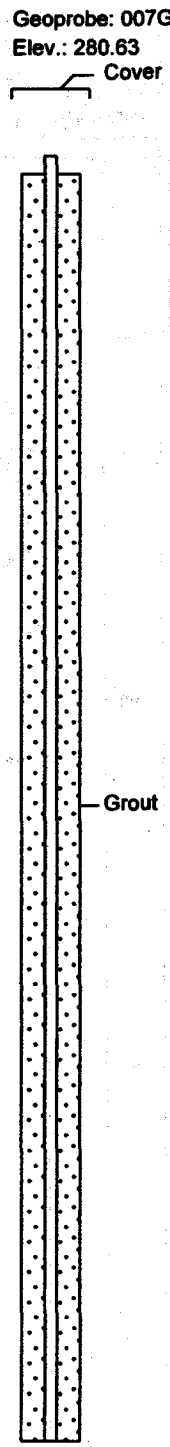
NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1020 7/21/99	Northing	: 398282.45
Finished	: 1015 7/22/99	Easting	: 811099.55
Drilling Method	: Rotasonic	TOC Elevation	: 280.63
Drilling Company	: Allinance Drilling	Total Depth	: 115 feet
Geologist	: C. Davis	Well Screen	: 105 to 115 feet

Geoprobe: 007G56LF
Elev.: 280.63

Depth in Feet	Surf. Elev. 277.09	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	277						(0 - 5) Med. brown silt, dry to slightly moist, slightly stiff
		1	80				(5 - 15) Lt. brown and Lt. grey mottled slightly clayey silt w/ iron staining and iron-manganese nodules, slightly moist, slightly stiff
5	272						(15 - 15.5) Grayish brown clayey silt w/ iron staining, moist
						ML	
10	267	2	55				
15	262						(15.5 - 24) Grayish brown silty clay, moist
20	257	3	100			CL	
						ML	(24 - 25) Grayish brown clayey silt w/ iron staining, moist
25	252					CH	(25 - 26) Brownish gray silty clay, very moist
						ML	(26 - 27) Lt. orangish yellowish brown clayey silt mottled w/ greenish gray lenses and iron staining, moist, stiff (27 - 35.5) Greenish gray clayey silt mottled w/ Lt. brown and greyish brown clayey silt w/ iron staining and iron-manganese nodules
30	247	4	100				(35.5 - 40) Greenish gray clayey silt mottled w/ Lt. brown and greyish brown clayey silt w/ iron staining and iron-manganese nodules, contains traces of fine sand, moist, stiff (40 - 42) Lt. brown and Lt. gray fine sandy and gravelly clayey silt, moist
35							



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ENSAFE

BORING LOG of 007G56LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7

Project #: CTO 0094

Started	: 1020 7/21/99	Northing	: 398282.45
Finished	: 1015 7/22/99	Easting	: 811099.55
Drilling Method	: Rotasonic	TOC Elevation	: 280.63
Drilling Company	: Allinance Drilling	Total Depth	: 115 feet
Geologist	: C. Davis	Well Screen	: 105 to 115 feet

Geoprobe: 007G56LF
Elev.: 280.63

Depth in Feet	Surf. Elev. 277.09	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
35	242						
						ML	
40	237	5	100				
						SW	(42 - 43) Reddish orangish brown (iron stained) fine to coarse sand w/ traces of silt/clay and gravel (up to 2" dia.), moist
						ML	
						SW	(43 - 44) Lt. gray fine sandy and gravelly clayey silt, moist
45	232					SP	(44 - 45) Lt. brown to orangish yellowish brown silty clayey fine to coarse sand w/ gravel (up to 2" dia.) moist
						SW	(45 - 46) Yellowish orangish brown med. sand, wet
							(46 - 48) Yellowish orangish brown med. to very coarse sand w/ gravel (up to 1" dia.), wet
50	227	6	100			SP	(48 - 51.5) Yellowish orangish brown med. sand, wet
							(51.5 - 55) Yellowish orangish brown med. to very coarse sand w/ gravel (up to 1" dia.), wet
							(55 - 75) Yellowish orangish brown med. to very coarse sand w/ gravel (up to 3" dia.), wet A sand and gravel concretion the size of core barrel at 58
55	222						
							(73 - 75) Yellowish orangish brown med. to very coarse sand w/ gravel (up to 3" dia.), slightly moist
60	217	7	100			SW	
65	212						
		8	100				
70							

ENSAFE

BORING LOG of 007G56LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1020 7/21/99	Northing	: 398282.45
Finished	: 1015 7/22/99	Easting	: 811099.55
Drilling Method	: Rotasonic	TOC Elevation	: 280.63
Drilling Company	: Allinance Drilling	Total Depth	: 115 feet
Geologist	: C. Davis	Well Screen	: 105 to 115 feet

Geoprobe: 007G56LF
Elev.: 280.63

Depth in Feet	Surf. Elev. 277.09	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
70	207	8	100			SW	
75	202					GW	(75 - 76) Yellowish orangish brown fine to coarse gravel (upp to 2" dia.) w/ med. to very coarse sand, wet
						SW	(76 - 81) Fine to very coarse sand and fine to coarse gravel (up to 2" dia.) mix w/ iron staining, wet
80	197	9	100				
						SP	(81 - 87) Pale yellow to pale orange iron stained fine sand, wet
85	192						
						SW	(87 - 88) Fine to coarse sand and gravel (up to 1" dia.) w/ some gray clay, wet
						SP	(88 - 89) Pale yellow to pale orange iron stained fine sand w/ some gravel (up to 1" dia.), wet
90	187	10	100			SW	(89 - 90) Fine to coarse sand and gravel (up to 1" dia.) w/ some gray clay, wet
						SP	(90 - 91) Pale yellow to pale orange iron stained fine sand w/ some gravel (up to 2 1/2" dia.), wet
						SW	(91 - 92.5) Fine to coarse sand and gravel (up to 1" dia.) w/ some gray clay, wet
						SP	(92.5 - 93) Pale yellow to pale orange iron stained fine sand, wet
95	182						(93 - 95) Fine to coarse sand and gravel (up to 4" dia.) w/ some gray clay, wet
						SC	(95 - 101) Fine to coarse sand and gravel (up to 5" dia.) w/ gray clay, wet (101 - 104) Fine to coarse sand and gravel (up to 1" dia.) w/ increasing gray clay contents, wet
100	177	11	100				
105						SW	

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ENSAFE

BORING LOG of 007G56LF

NSA MIDSOUTH
Millington, TN.

Location: AOCA/SWMU 7
Project #: CTO 0094

Started	: 1020 7/21/99	Northing	: 398282.45
Finished	: 1015 7/22/99	Easting	: 811099.55
Drilling Method	: Rotasonic	TOC Elevation	: 280.63
Drilling Company	: Allinance Drilling	Total Depth	: 115 feet
Geologist	: C. Davis	Well Screen	: 105 to 115 feet

Geoprobe: 007G56LF
Elev.: 280.63

Depth in Feet	Surf. Elev. 277.09	SAMPLES	% Rec-overy	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
105	172						(105 - 115) Fine to coarse sand and gravel (up to 3 to 4" dia.), wet
110	167	12	30			SC	
115	162					CL	(115 - 118) Pale yellowish brown fine sandy clay w/ few gravel (up to 1 1/2" dia.), very moist to wet
						CH	(118 - 120) Pale yellowish brown to dark brown fat clay w/ iron staining, very moist
120	157	13	100			SC	(120 - 123) Lt. gray to pale yellowish brown clayey fine sand, very moist
						SP	(123 - 125) Lt. gray fine sand, very moist to wet
125	152					CL	(125 - 131) Dark olive gray to dark olive brown clay, moist, stiff (131 - 134.5) Pale yellowish gray fine sandy clay, moist, some what stiff
130	147	14	100				
135	142					SC	(134.5 - 135) Yellowish orange slightly clayey to very clayey sand, moist
140							

LOG OF BORING 007G57LF

NSA MID-SOUTH
Millington, TN.

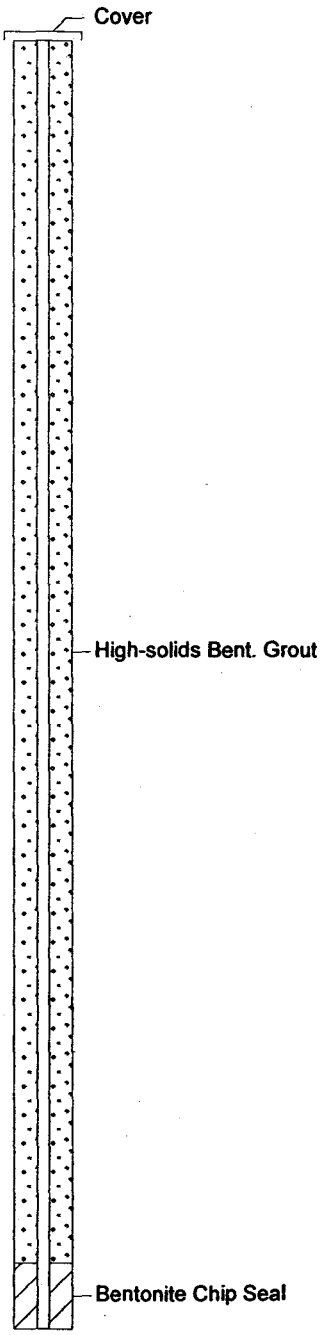
Location: Building N-126

Project #: CTO 0094

Started	: 0850 12/1/99	Northing	: 392231.80
Finished	: 0630 12/1/99	Easting	: 813751.34
Drilling Method	: Rotasonic	TOC Elevation	: 283.17
Drilling Company	: Boart-Longyear	Total Depth	: 75 feet
Geologist	: Bart Douglas	Well Screen	: 42 to 72 feet

Depth in Feet	Surf. Elev. 283.17	Samples	% Recovery	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	283						CONCRETE
							CLAYEY SILT
		1	100	0			(0.5-6) Dark-brown, moist, and stiff.
5	278						
10	273	2	100	0			(6-15) Brown, medium to stiff, and wet.
15	268					ML	
20	263	3	100	0			(15-26) Dark-gray and medium.
25	258						(26-29) Gray and soft.
30	253	4	100	0			(29-32) Mottled brown and gray with a trace of fine sand throughout.
							CLAYEY SAND
							(32-34) Mottled brown to gray and fine-grained.
35	248					SC	
		5	100	0			(34-42) Reddish-brown to orange and fine- to medium-grained with some clay.
40		6	100	0.9			

Well: 007G57LF
Elev.: 283.17



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LOG OF BORING 007G57LF

NSA MID-SOUTH
Millington, TN.

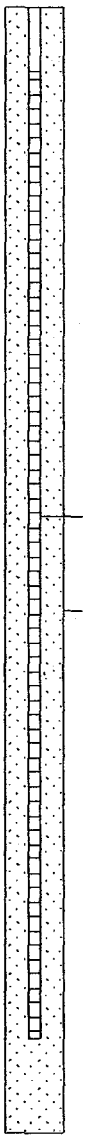
Location: Building N-126

Project #: CTO 0094

Started	: 0850 12/1/99	Northing	: 392231.80
Finished	: 0630 12/1/99	Easting	: 813751.34
Drilling Method	: Rotasonic	TOC Elevation	: 283.17
Drilling Company	: Boart-Longyear	Total Depth	: 75 feet
Geologist	: Bart Douglas	Well Screen	: 42 to 72 feet

Depth in Feet	Surf. Elev. 283.17	Samples	% Recovery	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
40	243	6	100	0.9		SC	
		7	100	1.4		SP	SAND, reddish-brown to tan and fine-grained.
45	238	8	100	1.1		GW	SANDY GRAVEL, well graded, reddish-brown with medium sand.
		9	100	0.65			
50	233	10	100	1			
55	228	11	100	1.3		SW	GRAVELLY SAND,well graded, tan, and medium- to coarse-grained with gravel content varying throughout.
60	223	12	100	0.96			
		13	100	1.2			
65	218	14	100	2.5			
		15	100	1.1			
70	213	16	100	0		GW	SANDY GRAVEL, well graded with coarse sand.
		17	100	0		ML	CLAYEY SILT, dark-brown to gray with mica and lignite specks throughout.
75	208						Cockfield contact at 72 feet.
80							

Well: 007G57LF
Elev.: 283.17



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LOG OF BORING 007G58LF

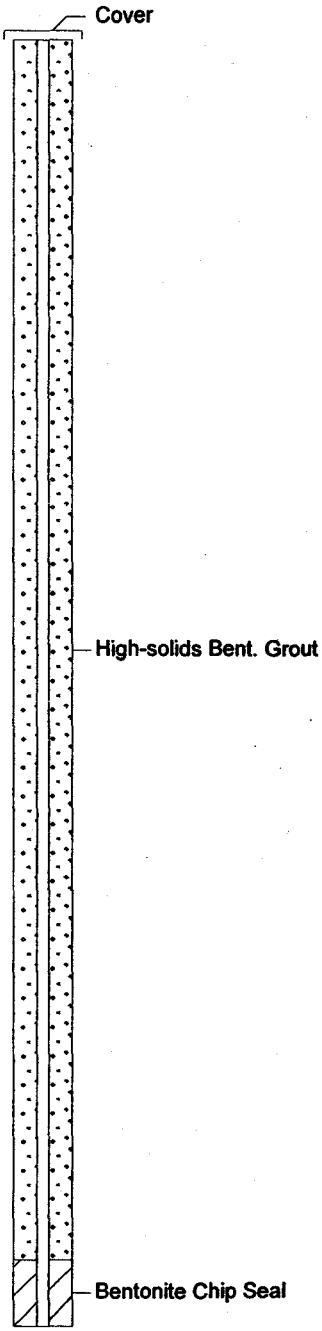
NSA MID-SOUTH
Millington, TN.

Location: Building N-126
Project #: CTO 0094

Started	: 0930 11/22/99	Northing	: 392157.47
Finished	: 0910 11/23/99	Easting	: 8137755.32
Drilling Method	: Rotasonic	TOC Elevation	: 283.22
Drilling Company	: Boart-Longyear	Total Depth	: 80 feet
Geologist	: Bart Douglas	Well Screen	: 42 to 72 feet

Depth in Feet	Surf. Elev. 283.22	Samples	% Recovery	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	283						CONCRETE
						GP	GRAVEL and SAND FILL
		1	100	0			CLAYEY SILT (2-5) Dark-brown, dry, and stiff.
5	278						Wet at 7'.
10	273	2	100	0			(5-15) Brown, and medium to soft.
						ML	
15	268						
20	263	3	100	0			(15-25) Reddish-brown w/ trace fine sand, moist, and medium to stiff.
25	258						
		4	100	0		CL	SANDY CLAY, reddish-brown, moist and stiff with fine sand.
		5	100	2			CLAYEY SAND
30	253						(29-35) Reddish-brown and fine-grained with silt.
		6	100	1.6			
		7	100	2		SC	
35	248						
		8	100	16.7			(35-39) Changing to tan and yellowish-brown.
		9	100	27			
40						SM	

Well: 007G58LF
Elev.: 283.22



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LOG OF BORING 007G58LF

NSA MID-SOUTH
Millington, TN.

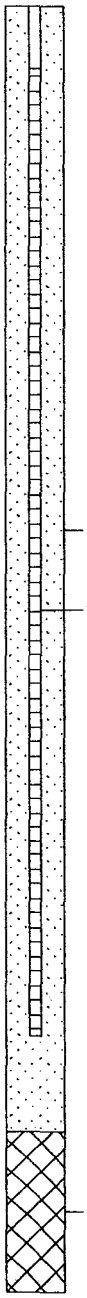
Location: Building N-126

Project #: CTO 0094

Started	: 0930 11/22/99	Northing	: 392157.47
Finished	: 0910 11/23/99	Easting	: 8137755.32
Drilling Method	: Rotasonic	TOC Elevation	: 283.22
Drilling Company	: Boart-Longyear	Total Depth	: 80 feet
Geologist	: Bart Douglas	Well Screen	: 42 to 72 feet

Well: 007G58LF
Elev.: 283.22

Depth in Feet	Surf. Elev. 283.22	Samples	% Rec-overy	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
40	243	9	100	27		SM	SILTY SAND, light-brown to tan and fine- to medium-grained with a trace of clay.
		10	100	102			
45	238	11	100	104		SW	GRAVELLY SAND,well graded. (45-49) Tan to gray and fine- to medium-grained with a trace of gravel.
50	233	12	100	100			(49-55) Tan and medium-grained with gravel throughout.
		13	100	136			
55	228	14	100	36			
		15	100	47			(55-65) Light-brown to tan, medium- to coarse-grained and gravelly
60	223	16	100	103			
		17	100	213			
65	218	18	100	13		GW	SANDY GRAVEL, well graded and brown with coarse sand.
		19	100	39			
70	213	20	100	35			
		21	0	NA		ML	SANDY SILT, dark-reddish-brown to gray.
75	208	22	0	NA			Although there was no recovery from 72 to 80 feet, samples of sandy silt were smudged on the bottom 8 feet of the sampling rod. Therefore, the Cockfield contact was estimated at 72 feet. Native formation materials collapsed and backfilled the bottom 5 feet of the borehole.
80							



LOG OF BORING 007G59LF

NSA MID-SOUTH
Millington, TN.

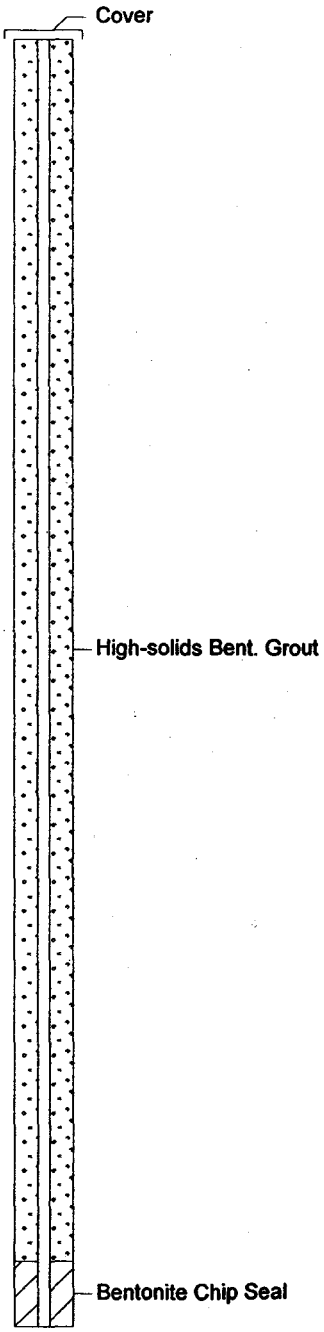
Location: Building N-126

Project #: CTO 0094

Started	: 0930 11/23/99	Northing	: 392163.98
Finished	: 1500 11/29/99	Easting	: 813790.26
Drilling Method	: Rotasonic	TOC Elevation	: 283.17
Drilling Company	: Boart-Longyear	Total Depth	: 75 feet
Geologist	: Bart Douglas	Well Screen	: 42 to 72 feet

Depth in Feet	Surf. Elev. 283.17	Samples	% Rec-overy	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	283						CONCRETE
						GP	GRAVEL and SAND FILL
		1	100	2.3		ML	CLAYEY SILT (2-5) Dark-brown, dry, and very stiff.
5	278						
10	273	2	35	0			(5-22) Medium to stiff.
15	268	3	100	2.2			
20	263	4	100	0			
		5	100	0.7			(22-25) Reddish-brown to orange-brown, moist, and medium.
25	258	6	100	4.4		CL	SANDY CLAY, reddish-brown and stiff with fine sand and silt.
30	253	7	100	4.9		SC	CLAYEY SAND, reddish-brown. (28-32) Fine- to medium- grained.
		8	100	6.1			(32-35) Medium-grained.
35	248	9	0	NA			(35-40) Fine-grained.
		10	100	34			
40							

Well: 007G59LF
Elev.: 283.17



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LOG OF BORING 007G59LF

NSA MID-SOUTH
Millington, TN.

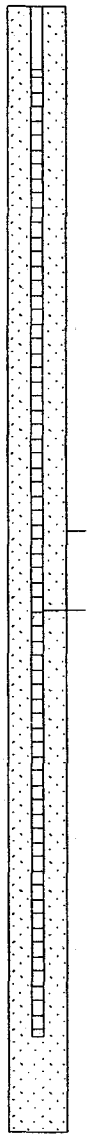
Location: Building N-126

Project #: CTO 0094

Started	: 0930 11/23/99	Northing	: 392163.98
Finished	: 1500 11/29/99	Easting	: 813790.26
Drilling Method	: Rotasonic	TOC Elevation	: 283.17
Drilling Company	: Boart-Longyear	Total Depth	: 75 feet
Geologist	: Bart Douglas	Well Screen	: 42 to 72 feet

Depth in Feet	Surf. Elev. 283.17	Samples	% Recovery	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
40	243	10	100	34		SC	(40-42) Reddish-brown to tan.
		11	100	44		SP	SAND, light-brown to tan and fine-grained.
45	238	12	100	50		SW	GRAVELLY SAND, well graded, light-brown to tan and medium-grained.
50	233	13	100	69		GW	SANDY GRAVEL, well graded with medium- to coarse-grained sand.
		14	100	130			
55	228	15	100	55			
		16	100	19			
60	223	17	100	42		SW	GRAVELLY SAND, well graded and medium-grained.
		18	100	117			
65	218	19	100	33		GW	SANDY GRAVEL, well graded with medium sand.
70	213	20	100	38			
		21	100	3.4		ML	CLAYEY SILT, dark-gray to brown, micacius and soft with lignite throughout.
75	208						Cockfield contact at 72 feet.
80							

Well: 007G59LF
Elev.: 283.17



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LOG OF BORING 007G60LF

NSA MID-SOUTH
Millington, TN.

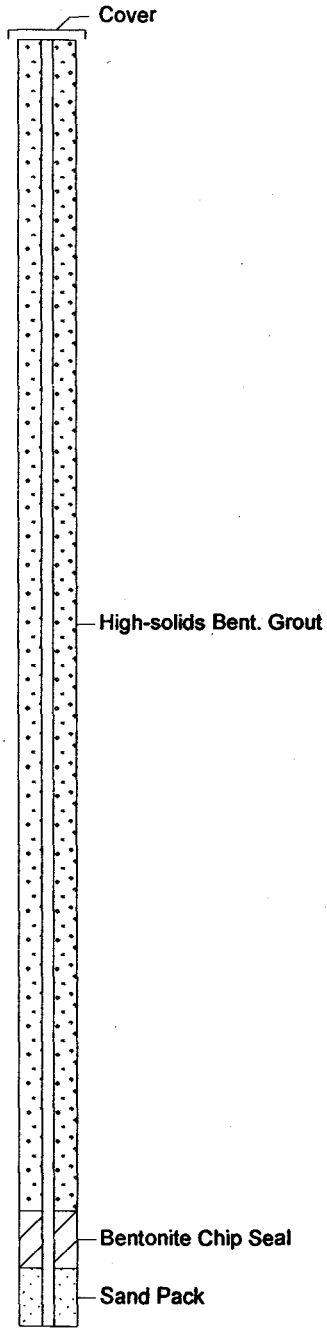
Location: Building N-126

Project #: CTO 0094

Started	: 0730 11/30/99	Northing	: 392114.00
Finished	: 2200 11/30/99	Easting	: 813797.36
Drilling Method	: Rotasonic	TOC Elevation	: 283.26
Drilling Company	: Boart-Longyear	Total Depth	: 85 feet
Geologist	: Bart Douglas	Well Screen	: 45 to 75 feet

Depth in Feet	Surf. Elev. 283.26	Samples	% Rec-overy	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	283						CONCRETE
		1	40	0		ML	CLAYEY SILT (1-6.5) Dark-brown, moist, and medium.
5	278	2	100	3.2			
10	273	3	100	0.8			(6.5-19) Brown, soft and wet. Medium stiffness below 16 feet.
		4	100	3.4			
15	268	5	100	2.2			
		6	100	6.8			
20	263						(19-23) Reddish-brown and medium.
		7	100	5			(23-25) With fine sand throughout.
25	258	8	100	9.9		CL	SANDY CLAY, reddish-brown to orange-brown and medium with fine sand.
30	253	9	100	3.7		SC	CLAYEY SAND (28-39) Reddish-brown to orange-brown, fine- to medium-grained, and stiff.
		10	100	9.3			
35	248	11	100	12			
40	243	12	100	24			(39-42) Orange-brown to tan and fine- to medium-grained with some clay.
		13	100	38		SP	SAND, light-brown to tan and fine- to medium-grained.
45							

Well: 007G60LF
Elev.: 283.26



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LOG OF BORING 007G60LF

NSA MID-SOUTH
Millington, TN.

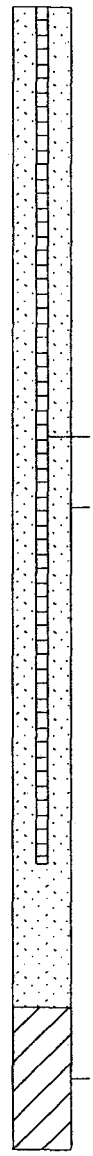
Location: Building N-126

Project #: CTO 0094

Started	: 0730 11/30/99	Northing	: 392114.00
Finished	: 2200 11/30/99	Easting	: 813797.36
Drilling Method	: Rotasonic	TOC Elevation	: 283.26
Drilling Company	: Boart-Longyear	Total Depth	: 85 feet
Geologist	: Bart Douglas	Well Screen	: 45 to 75 feet

Depth in Feet	Surf. Elev. 283.26	Samples	% Rec-overy	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
45	238					SP	
		14	100	25		SW	GRAVELLY SAND,well graded. (46-50) Tan and medium-grained with a trace of gravel.
50	233	15	100	57			
		16	100	71			(50-65) Tan and medium- to coarse-grained with gravel content varying throughout.
55	228	17	100	37			
60	223	18	100	43			
		19	100	55			
65	218	20	100	NA			
		21	100	NA			(65-69) Brown to tan.
70	213	22	100	NA		GW	SANDY GRAVEL, well graded with coarse sand.
		23	100	NA			
75	208	24	0	NA		ML	SANDY SILT, gray and clayey with fine sand, mica, and lignite specks throughout. One reddish-orange iron concreation at 74.5. Cockfield contact at 74.5 feet.
80	203						
85	198						
90							

Well: 007G60LF
Elev.: 283.26



LOG OF BORING 007G61LF

NSA MID-SOUTH
Millington, TN.

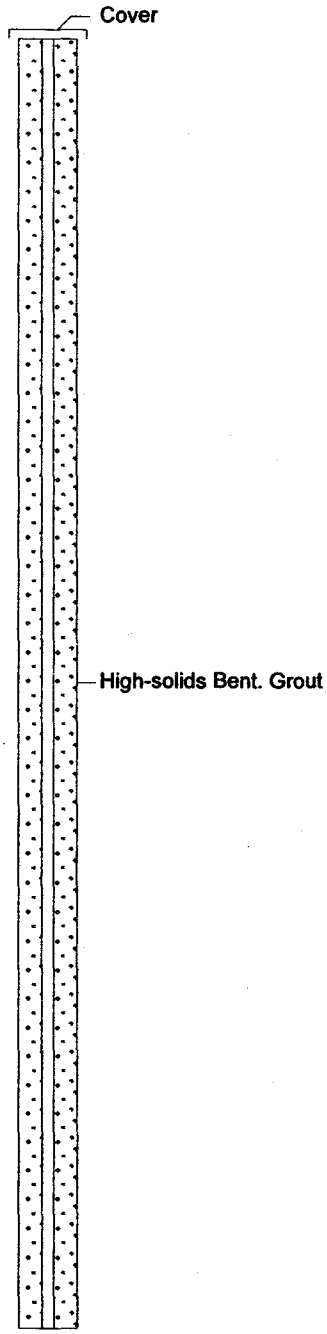
Location: Building N-126

Project #: CTO 0094

Started	: 1000 12/2/99	Northing	: 392122.48
Finished	: 1800 12/2/99	Easting	: 813813.14
Drilling Method	: Rotasonic	TOC Elevation	: 283.04
Drilling Company	: Boart-Longyear	Total Depth	: 75 feet
Geologist	: Bart Douglas	Well Screen	: 45 to 75 feet

Depth in Feet	Surf. Elev. 283.04	Samples	% Recovery	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	283						CONCRETE
		1	100	0		ML	CLAYEY SILT (1-4) Dark-brown.
5	278						
							(4-16) Brown.
10	273	2	100	0			
15	268						
20	263	3	100	0			(16-25) Reddish-brown.
25	258					CL	SANDY CLAY, reddish-brown to orange-brown with fine sand.
30	253	4	100	0			
35	248	5	100	0		SC	CLAYEY SAND, reddish-brown to orange-brown and fine-grained.
		6	100	5.6		SP	SAND, yellowish-brown to tan and fine- to medium-grained.
40							

Well: 007G61LF
Elev.: 283.04



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ENSAFE

LOG OF BORING 007G61LF

NSA MID-SOUTH
Millington, TN.

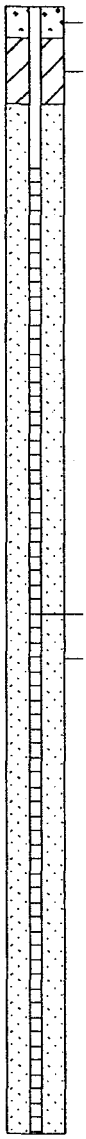
Location: Building N-126

Project #: CTO 0094

Started	: 1000 12/2/99	Northing	: 392122.48
Finished	: 1800 12/2/99	Easting	: 813813.14
Drilling Method	: Rotasonic	TOC Elevation	: 283.04
Drilling Company	: Boart-Longyear	Total Depth	: 75 feet
Geologist	: Bart Douglas	Well Screen	: 45 to 75 feet

Depth in Feet	Surf. Elev. 283.04	Samples	% Recovery	FID (ppm)	GRAPHIC	USCS	DESCRIPTION
40	243	6	100	5.6			
		7	100	182		SP	
45	238	8	100	57			
		9	100	13		SW	GRAVELLY SAND, well graded and medium-grained.
50	233	10	100	93			
		11	100	285			SANDY GRAVEL, well graded with medium to coarse sand.
55	228	12	100	85			
		13	100	78			
60	223	14	100	37			
		15	100	78		GW	
65	218	16	100	27			
70	213	17	100	18			
75	208					ML	CLAYEY SILT, gray with mica throughout.
							Cockfield contact at 74 feet.
80							

Well: 007G61LF
Elev.: 283.04



EnSafe Inc.

Log of: 007GPZ01

Project: NSA MID-SOUTH RFI	Location: NSA Mid-South, Millington, Tennessee
CTO: 0094	Drilling Company: Boart-Longyear
Date Started: 11/16/98	Geologist: Ben Brantley
Date Completed: 11/16/98	Total Depth: 64 feet

Depth in feet	Soil Class	Geologic Description
10	ML/CL	Loess. Silt. Light orange-brown and gray mottled. Some slighely clayey silt. Dry
20	ML/CL	Loess. Clayey silt. Loose. Wet.
30	SP/SM	Fluvial Deposits. Fine sand with silt. Light orange-brown. Saturated.
40	SP/SM	Fluvial. Sand and gravel with silt. Light gray. Saturated.
50		
60		Fluvial. Fine silty sand. Light gray. Saturated.
70	SP/SM	TD= 64 feet bgs

Note: This is a generalized boring log describing the basic lithology typically encounted at NSA Mid-South and may or may not describe the specific lithology at this location.

EnSafe Inc.

Log of: 007GPZ02

Project: NSA MID-SOUTH RFI	Location: NSA Mid-South, Millington, Tennessee
CTO: 0094	Drilling Company: Boart-Longyear
Date Started: 11/17/98	Geologist: Ben Brantley
Date Completed: 11/17/98	Total Depth: 65 feet

Depth in feet	Soil Class	Geologic Description
	ML/CL	Loess. Silt. Light orange-brown and gray mottled. Some slighely clayey silt. Dry
10		
	ML/CL	Loess. Clayey silt. Loose. Wet.
20		
30		
	SP/SM	Fluvial Deposits. Fine sand with silt. Light orange-brown. Saturated.
40		
	SP/SM	Fluvial. Sand and gravel with silt. Light gray. Saturated.
50		
60		
		Fluvial. Fine silty sand. Light gray. Saturated.
	SP/SM	
70		
		TD= 65 feet bgs

Note: This is a generalized boring log describing the basic lithology typically encounted at NSA Mid-South and may or may not describe the specific lithology existing at this location.

EnSafe Inc.

Log of: 007GPZ03

Project: NSA MID-SOUTH RFI	Location: NSA Mid-South, Millington, Tennessee
CTO: 0094	Drilling Company: Boart-Longyear
Date Started: 11/18/98	Geologist: Ben Brantley
Date Completed: 11/18/98	Total Depth: 84 feet

Depth in feet	Soil Class	Geologic Description
	ML/CL	Loess. Silt. Light orange-brown and gray mottled. Some slighely clayey silt. Dry
10		
	ML/CL	Loess. Clayey silt. Loose. Wet.
20		
30		
	SP/SM	Fluvial Deposits. Fine sand with silt. Light orange-brown. Saturated.
40		
	SP/SM	Fluvial. Sand and gravel with silt. Light gray. Saturated.
50		
60		Fluvial. Fine silty sand. Light gray. Saturated.
	SP/SM	
70		TD= 84 feet bgs

Note: This is a generalized boring log describing the basic lithology typically encounted at NSA Mid-South and may or may not describe the specific lithology existing at this location.

EnSafe Inc.

Log of: 007GPZ04

Project: NSA MID-SOUTH RFI	Location: NSA Mid-South, Millington, Tennessee
CTO: 0094	Drilling Company: Boart-Longyear
Date Started: 11/19/98	Geologist: Ben Brantley
Date Completed: 11/19/98	Total Depth: 87 feet

Depth in feet	Soil Class	Geologic Description
	ML/CL	Loess. Silt. Light orange-brown and gray mottled. Some slighely clayey silt. Dry
10		
	ML/CL	Loess. Clayey silt. Loose. Wet.
20		
30		
	SP/SM	Fluvial Deposits. Fine sand with silt. Light orange-brown. Saturated.
40		
	SP/SM	Fluvial. Sand and gravel with silt. Light gray. Saturated.
50		
60		
		Fluvial. Fine silty sand. Light gray. Saturated.
	SP/SM	
70		
		TD= 87 feet bgs

Note: This is a generalized boring log describing the basic lithology typically encounted at NSA Mid-South and may or may not describe the specific lithology existing at this location.

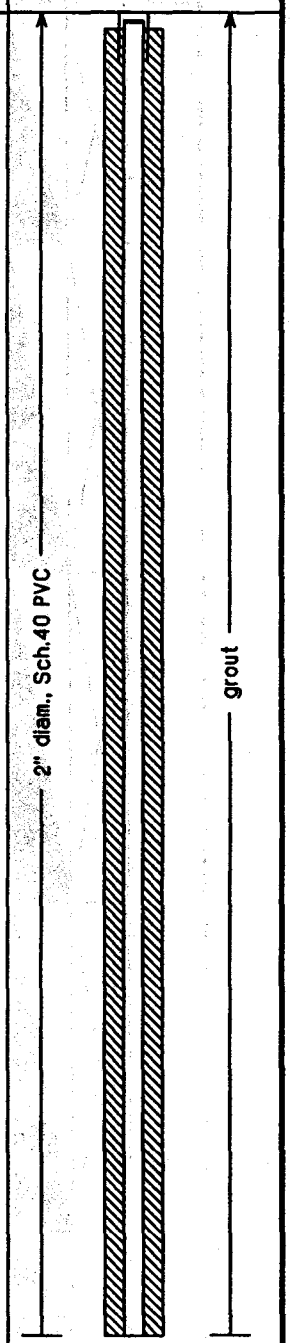
EnSafe/Allen & Hoshall

Log of Monitoring Well N12G01LF

Project: *NAS Memphis Millington, TN*	Location: *N-12 Site*
Project No.: *0094*	Surface Elevation: *feet msl*
Started at *1405 on 7-21-98*	TOC Elevation: *feet msl*
Completed at *1645 on 7-21-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" core barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *87 feet*
Geologist: *David E. Ladd*	Well Screen: *71.5 to 81.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			s-1	100	na		Fill	(0-2') Gravel and fill.	
			s-2	100	na		ML	(2-3') Silt, moderate yellowish brown mottled with olive gray. Contains organic material.	
							Fill		
5							ML	(3-4') Fill - possibly sluff from core barrel.	
			s-3	50	0.4		ML	(4-5') Silt, moderate yellowish brown mottled with olive gray.	
								(5-7') Silt, olive gray.	
10								(8-17') Silt, clayey, moderate yellowish brown mottled with olive gray and dark yellowish orange. Most mottling occurs from 8-10'. Abundant organic nodules and iron-manganese nodules, especially from 8-10'.	
15									
			s-4	70	0.2			(17-20') Same as above.	
20							ML	(19-27') silt, moderate yellowish brown. Contains a little dark yellowish orange material. Contains iron-manganese nodules, especially near 27'.	
25									
			s-5	65	4.0			(27-30') Same as above.	
30								(30-37') Silt, with clay, moderate yellowish brown mottled with greenish gray, light gray, and dark yellowish orange. Mostly greenish gray from 32-34'. Abundant oxidation. Contains iron-manganese nodules, especially near 37'. Very dry from 31-34'.	
35							ML		
			s-6	105	0.4			(37-39.5') Same as above, becoming abundantly iron-stained and slightly sandy at 39.5'.	
40							SC	(39.5-40.5') Sand, very fine, light gray,	

WELL DIAGRAM



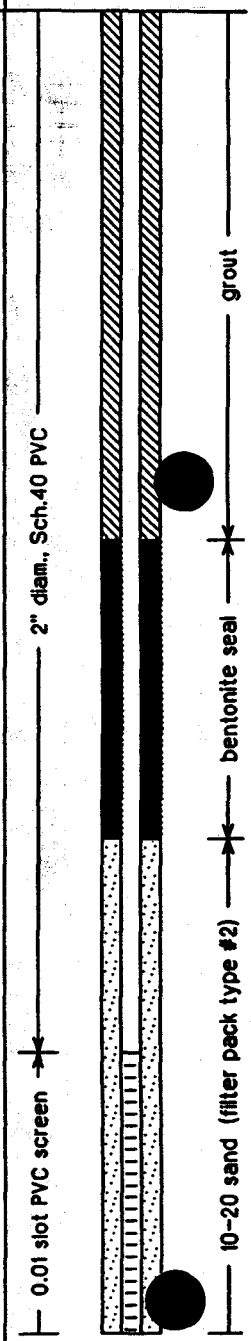
EnSafe/Allen & Hoshall

Log of Monitoring Well N12G01LF

Project: *NAS Memphis Millington, TN*	Location: *N-12 Site*
Project No.: *0094*	Surface Elevation: *feet msl*
Started at *1405 on 7-21-98*	TOC Elevation: *feet msl*
Completed at *1645 on 7-21-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" core barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *87 feet*
Geologist: *David E. Ladd*	Well Screen: *71.5 to 81.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SC	becoming clayey, light olive gray near bottom.	
							SC	(40.5-42.5') Sand, very fine to fine, dusky yellowish brown, very micaceous. Wet.	
							SW	(42.5-44') Sand, very fine to medium, dark yellowish orange to grayish orange. Very oxidized near bottom. Wet.	
45							SW		
			s-7	100	0.8			(44-44.5') Sand, very fine, light gray. Contains one piece of gravel.	
50							SC	(44.5-47') Sand, very fine to fine, grayish orange to dark yellowish orange. Wet. (47-54') Same as above. Mostly grayish orange. Contains some pale yellowish brown from 47-49'. Micaceous.	
55			s-8	95	0.4			(54-57') Sand, fine to very coarse, and gravel, dark yellowish orange to grayish orange. Contains mostly chert gravels, angular, up to 2" long dimension, poorly sorted. Micaceous, wet. (57-67') Same as above.	
60									
65									
			s-9	80	na		GC	(67-77') Same as above. Upper 5' is lighter in color. Gravels becoming coarser with depth (up to 2.5" long dimension). Many gravels look iron-stained or iron-rich. There is a clayey grayish orange to light gray sand seam at 76'.	
70									
75									
			s-10	90	na			(77-81.5') same as above, becoming sandy near bottom.	
80									

WELL DIAGRAM



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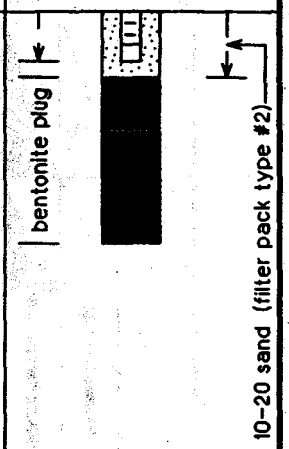
Log of Monitoring Well N12G01LF

Project: *NAS Memphis Millington, TN*	Location: *N-12 Site*
Project No.: *0094*	Surface Elevation: *feet msl*
Started at *1405 on 7-21-98*	TOC Elevation: *feet msl*
Completed at *1645 on 7-21-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" core barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *87 feet*
Geologist: *David E. Ladd*	Well Screen: *71.5 to 81.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							GC		
							SC	(81.5-83.5') Tcf. Sand, very fine, dark yellowish orange mottled with light gray and olive gray.	
85			s-11	100	na		CL	(83.5-87') Clay, and sand, very fine, dusky yellowish brown with light gray sand seams. Lignitic, especially at top. Micaceous. .l-87 **Bottom of boring at 87'bgs**	
90									
95									
100									
105									
110									
115									
120									

WELL DIAGRAM



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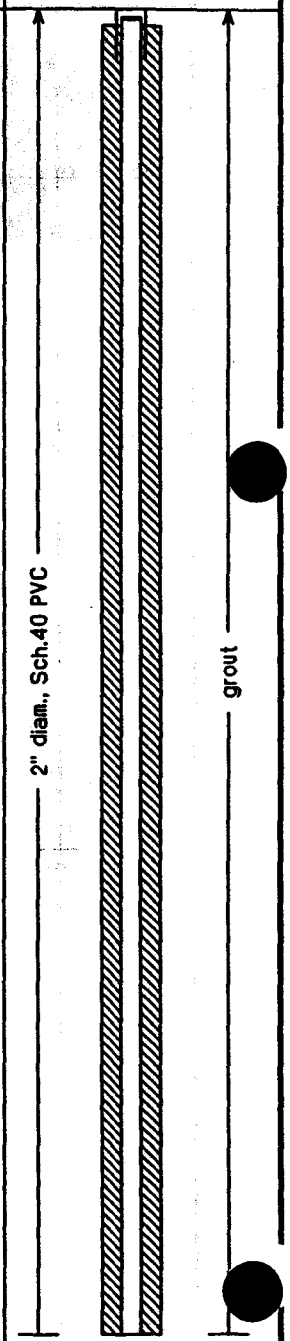
Log of Monitoring Well N12G02LF

Project: *NAS Memphis Millington, TN*	Location: *Apron Area, near N-12 site*
Project No.: *0094*	Surface Elevation: *feet msl*
Started at *1445 on 8-4-98*	TOC Elevation: *feet msl*
Completed at *1630 on 8-4-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" core barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0-6') Grass and roots.	
								(0.5-5') Moderate brown streaked with yellowish gray silt, dry.	
5			s-1	80	0.4			(5-8.5') Same as above, without yellow gray streaks	
								Wet from 7-8.5'.	
10							ML	NO RECOVERY from 8.5-15'.	
15			s-2	35	BG			(15-23') Dark yellowish brown clayey silt, moist and medium stiff.	
20									
								(23-25') Moderate yellowish brown clayey silt, moist and medium stiff.	
25			s-3	80	BG		ML	(25-29') Dark yellowish orange mixed with yellowish gray clayey silt, moist and medium stiff.	
								(27-29') Manganese and iron streaks.	
30							ML	(29-34') Moderate yellowish brown sandy silt with yellowish gray streaks.	
35			s-4	105	BG		SM	(34-35') Grayish orange to dark yellowish orange silty sand.	
							CL	(35-38.5') Light brown to moderate reddish brown (rust-colored) sandy clay, with grayish orange silt, stiff and moist.	
40							SC	Dark yellowish orange fine sand (micaceous)	

WELL DIAGRAM



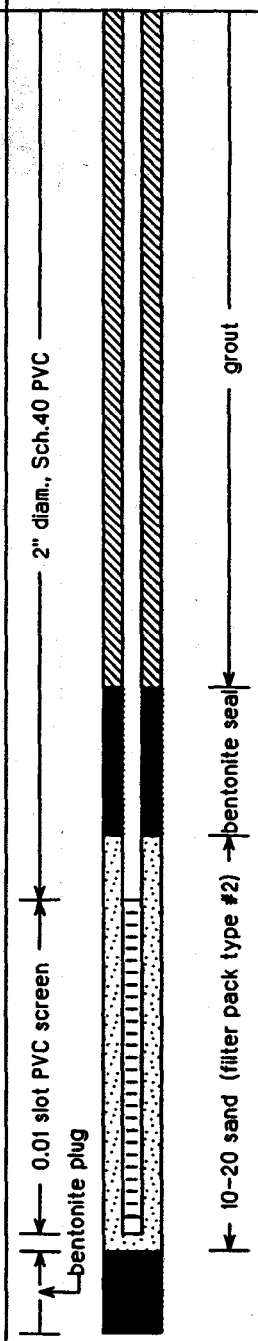
EnSafe/Allen & Hoshall

Log of Monitoring Well N12G02LF

Project: *NAS Memphis Millington, TN*	Location: *Apron Area, near N-12 site*
Project No.: *0094*	Surface Elevation: *feet msl*
Started at *1445 on 8-4-98*	TOC Elevation: *feet msl*
Completed at *1630 on 8-4-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" core barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SC	(38.5-65.5') Light brown fine sand with grayish orange and yellowish gray fine sand.	
45			s-5	90	0.2			(45-55') Grayish orange fine sand, micaceous.	
50									
55			s-6	85	0.4			Same as above.	
60								(55-65.5') Grayish orange fine sand, micaceous.	
65			s-7	75	0.2				
							SW	Grayish orange gravelly sand, fine to coarse-grained.	
								(65.5-67.5') Pale brown sandy gravel.	
70								(67.5-68.5') Gravels up to 2" long dimension.	
							GM	(68.5-78') Grayish orange and dark yellowish orange sandy gravel.	
75			s-8	85	0.6				
							SM	(78-79.5') Grayish orange and light gray fine silty sand.	
80									

WELL DIAGRAM



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Log of Monitoring Well N12G02LF

Project: *NAS Memphis Millington, TN*	Location: *Apron Area, near N-12 site*
Project No.: *0094*	Surface Elevation: *feet msl*
Started at *1445 on 8-4-98*	TOC Elevation: *feet msl*
Completed at *1630 on 8-4-98*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" core barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *85 feet*
Geologist: *Ben Brantley*	Well Screen: *67 to 77 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SM	(79.5-85') Dark yellowish orange and yellowish gray fine silty sand, moderately cohesive.		bentonite plug
85			s-9	na	na			**Boring completed at 85'bgs.**		
90										
95										
100										
105										
110										
115										
120										

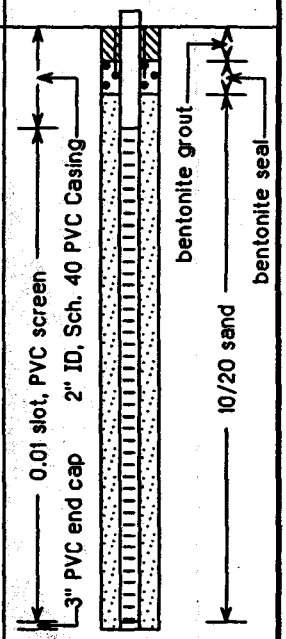
EnSafe/Allen & Hoshall

Log of Monitoring Well N12G01LS

Project: *NSA Memphis*	Location: *Millington, TN. N-12 UST Investigation*
Project No.: *0136-001*	Surface Elevation: *285.18 feet msl*
Started at *1000 on 1-6-98*	TOC Elevation: *284.90 feet msl*
Completed at *1200 on 1-6-98*	Depth to Groundwater: *7.45 feet* Measured:
Drilling Method: *4.25" HMS; 5" CSS*	Groundwater Elevation: *2-9-98 feet msl*
Drilling Company: *Tri-State Testing*	Total Depth: *18.0 feet*
Geologist: *Barb McGavern-Atkinson*	Well Screen: *3 to 18 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Post hole the first 3 feet (2' of concrete, then 3' of silty clay). Save some soil for IDW characterization.	
								(3-4') Silty clay, medium brown.	
5								(4-5') Silty clay with gravels.	
							CL	(5-5.5') Silty clay, transition to mottled orange brown and light gray with brown iron concretions.	
			1	50	33			Took Foc sample at 8'.	
10								(8-9') Silty clay, light gray mottled with dark gray. Iron inclusions present.	
			2	83	41			(9-12') Silty clay, grades to mottled orange brown and light gray. Iron inclusions present.	272.2
15								Encoutered water at ~ 13.5-14'.	
							ML	Clayey silt, mottled light gray and orange brown. Dark red to brown iron concretions, partings throughout.	
			3	100	53				267.2
								Well set @ 18'; screen 18-3'.	
20									
25									
30									
35									
40									

WELL DIAGRAM



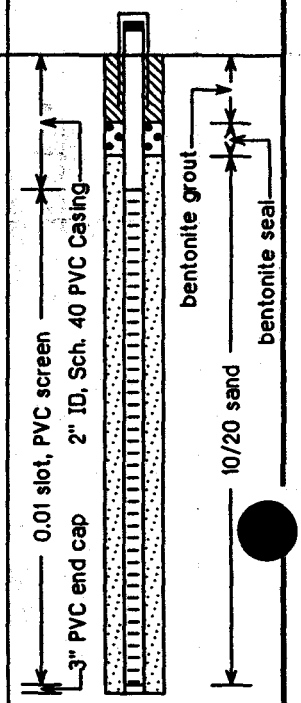
EnSafe/Allen & Hoshall

Log of Monitoring Well N12G02LS

Project: *NSA Memphis*	Location: *Millington, TN. N-12 UST Investigation*
Project No.: *0136-001*	Surface Elevation: *284.83 feet msl*
Started at *1440 on 1-6-98*	TOC Elevation: *287.06 feet msl*
Completed at *1640 on 1-6-98*	Depth to Groundwater: *9.32 feet* Measured:
Drilling Method: *4.25" HSA; 5" CSS*	Groundwater Elevation: *2-9-98 feet msl*
Drilling Company: *Tri-State Testing*	Total Depth: *19.0 feet*
Geologist: *Barb McGavern-Atkinson*	Well Screen: *4 to 19 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	Surface conditions: grassy area; posthole the first ~4', save some soil for IDW characterization.	
			1		NA			Clayey silt; medium brown with rootlets.	280.8
5							CL	(4-8") Silty clay, medium brown with rootlets, quartz pebbles, and hematitic blebs throughout.	
10			2	50	49			(8-9') Silty clay; mottled brown-orange and light gray; hematitic and (organic?) blebs throughout; some gravel to 4" diameter (long dim.).	275.8
15			3	100	51		SM	Silty sand, fine; mottled light gray and orange brown with hematitic blebs throughout, concentrated in some areas, increasing towards 14'. Moist Wet at ~14-14.5' Same as above with hematitic blebs throughout. Water began rising within a half hour.	
20			4	100	55			Well set @ 19.0'; screen 19-4'.	265.8
25									
30									
35									
40									

WELL DIAGRAM



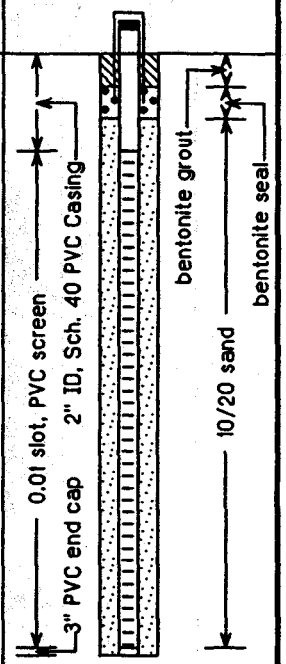
EnSafe/Allen & Hoshall

Log of Monitoring Well N12G03LS

Project: *NSA Memphis*	Location: *Millington, TN. N-12 UST Investigation*
Project No.: *0136-001*	Surface Elevation: *284.59 feet msl*
Started at *1215 on 1-7-98*	TOC Elevation: *286.69 feet msl*
Completed at *1415 on 1-7-98*	Depth to Groundwater: *9.40 feet* Measured:
Drilling Method: *4.25" HSA; 5" CSS*	Groundwater Elevation: *2-9-98 feet msl*
Drilling Company: *Tri-State Testing*	Total Depth: *19.0 feet*
Geologist: *Barb McGavern-Atkinson*	Well Screen: *3 to 18 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	NA		ML	Surface conditions: grassy area. Post hole the first ~3 feet of soil. Save some soil for IDW characterization. (3-5') Clayey silt; orange-brown with common gravels and wood chips. Dry.	
5							CL	(5-6') Silty clay; dark gray to green with hematitic blebs.	279.6
			2	100	32			(6-8') Silty clay; mottled tan/orange and gray; iron precipitation within rootlets, some iron nodules present. Moist.	276.6
10								(8-11') Clayey silt; mottled light gray and orange brown, with iron concretions and hematitic blebs. Moist	
			3	100	34		ML	(11-13') Same as above. At 11' there is a dark gray cross-bedded silty clay with iron blebs; mottled with light gray silty clay. Water at ~ 13'.	
15									
			4	100	29			Clayey silt; mottled light gray and orange brown with black (organics?) and iron blebs throughout.	266.6
20								Well set @ ~18'; screen 18-3'.	
25									
30									
35									
40									

WELL DIAGRAM



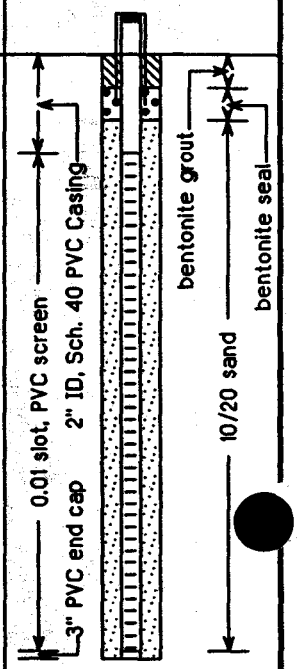
EnSafe/Allen & Hoshall

Log of Monitoring Well N12G04LS

Project: *NSA Memphis*	Location: *Millington, TN. N-12 UST Investigation*
Project No.: *0136-001*	Surface Elevation: *285.40 feet msl*
Started at *1000 on 1-8-98*	TOC Elevation: *287.41 feet msl*
Completed at *1200 on 1-8-98*	Depth to Groundwater: *9.57 feet* Measured:
Drilling Method: *4.25" HSA; 5' CSS*	Groundwater Elevation: *2-9-98 feet msl*
Drilling Company: *Tri-State Testing*	Total Depth: *18.0 feet*
Geologist: *Barb McGavern-Atkinson*	Well Screen: *3 to 18 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Post hole the first 3 feet (grassy) of soil. Save some soil for IDW characterization.	
5								(3.0-3.5') Clayey silt, medium gray to green gray.	
			1	66	33			(3.5-4.0') Clayey silt, medium brown mottled with light brown and iron stained silt. Iron precipitation cement within rootlet tubules. Some rootlets are preserved. Dry.	
10							ML	There is visual and olfactory indication of contamination present in the soil matrix. Odor is strong (petroleum/gasoline).	
			2	100	41			(4.5-5.5') Clayey silt, medium brown, with rare gravels. No iron or visual/olfactory indication of contamination in lower part of split spoon. Dry.	
15								(8.0-13.0') Clayey silt, medium gray stained green with contamination. Medium to strong odor present and obvious. Clayey silt is mottled with medium brown clayey silt and iron blebs throughout. Moist.	
			3	100	53				267.4
20								(13.0-18.0') Water encountered around 13.0'. Slight odor is apparent in split spoon sample. Soil is clayey silt mottled medium gray and brown, with iron/hematitic blebs throughout but rare.	
25								Well set at 18'; screen 18-3'.	
30									
35									
40									

WELL DIAGRAM



LITHOLOGIC LOG FOR MONITOR WELL GM-9

(007GM09M)

Description	Depth (ft)	Thickness (ft)
No Sample.....	0 - 14.0	14.0
Clay, pliable, green.....	14.0 - 17.0	3.0
Clay, dense, hard, green-brown.....	17.0 - 18.0	1.0
Clay, dense, hard, amber.....	18.0 - 19.0	1.0
Clay, dense, hard, marbled green and amber.....	19.0 - 24.0	5.0
Clay, medium pack, slightly sandy, amber..	24.0 - 34.0	10.0
Sand, medium grain, clayey, orange.....	34.0 - 39.0	5.0
Sand, medium to fine-grain, slightly clayey, orange-yellow.....	39.0 - 44.0	5.0
Sand, medium to fine-grain, tan to orange.....	44.0 - 49.0	5.0

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: T290ME1 DATE: 6-10-85 SHEET: 1 OF ____

LOCATION: Hanger DRILLING CONTRACTOR: (Tom Construction) American Drilling

WELL NUMBER: GM-9 DRILLING METHOD: Solid-stem auger

SAMPLE DESCRIBED BY: BTS/WDG SAMPLING METHOD: Sonic from auger

SAMPLE DESCRIPTION	Blows/ft	DEPTH INTERVAL (FEET)	THICKNESS (FEET)
Clay, Fine, dense, green, pliable		14-15	
same as above but dryer		15-16	
same as above		16-17	
Clay, fine, dense, green, stiff		17-18	
Clay, dense, & stiff, [illegible]		18-19	
Clay, dense, mottled green & [illegible], dry		19-20	
same as above		20-21	
same as above		21-24	
Clay, slightly sandy, medium green, amber/orange		24-34	
Sand, clayey, loose, medium grain orange		35-39	
Sand, slightly clayey, loose, medium to fine, orange grains		39-44'	
Sand, medium to fine, loose, tan to orange		44-49	

Screen 54' - 49'
Sand (1 bag) 45'-40' (tagged at 45', added 1 bag, tagged 40')
Bentonite

N-94 (North Fuel Farm)

UST Investigation
EnSafe/Allen & Hoshall

Leak Detection Wells
T301
T1242
T1243

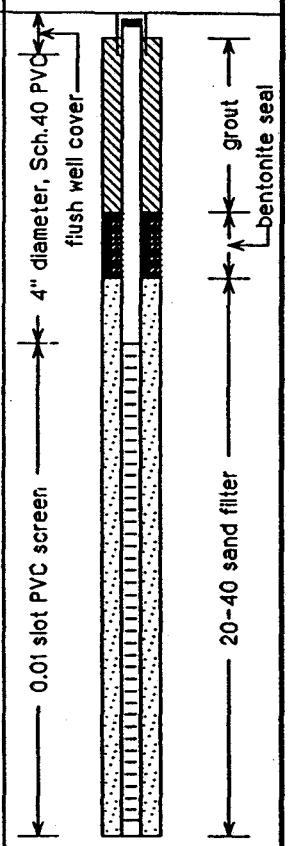
EnSafe Inc.

Log of Monitoring Well N-MW-5

Project: *North Fuel Farm*	Location: *NSA, Mid-South; Memphis, TN*
Project No.: *0134-001*	Surface Elevation: *flush grade*
Started at *0900 on 10-21-98*	TOC Elevation: *~4" bgs feet msl*
Completed at *1245 on 10-21-98*	Depth to Groundwater: *na feet* Measured: *na*
Drilling Method: *Hollow Stem Auger*	Groundwater Elevation: *na feet msl*
Drilling Company: *Tri-State Testing Services, Inc.*	Total Depth: *25 feet*
Geologist: *Barb McGavern-Atkinson*	Well Screen: *10 to 25 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Tps	(Surface-3.0') Surface conditions: Topsoil and allochthonous soil.	
			ss-1	33	na	na		GP	(3.0-11.5') Poorly sorted gravel fill (cobbles and boulders); fill of UST cavity.	
5										
			ss-2	0	na	na			Same as above (gravel fill).	
10										
			ss-3	35	na	na		ML	(11.5-19.5') At 11.5' grades to clayey silt, dark brown mottled with common light to medium gray; dense, firm, and moist;some petroleum and/or hydrocarbon odor noticeable.	
15										
			ss-4	100	na	na			(13.0'-18.0') Same as above run; petroleum and/or hydrocarbon odor is stronger throughout run.	
20								ML	(19.5'-20.0') At 19.5' grades to clayey silt, mottled dark brown with common reddish clayey silt; increased density and firmness; moist to wet.	
			ss-5	100	na	na		ML	(20.0'-23.0') At 20.0' grades to clayey silt with noticeable increase in clay fraction, reddish brown; firm, stiff, and moist; rare to common balck organic material.	
25			ss-6	100	na	na			(23.0'-25.0') Same as above, clayey silt, but with increase in silt fraction; friable, wet, with common black organic material.	
30										
35										
40										

WELL DIAGRAM



WELL CONSTRUCTION LOG. MEM-80-MW-1

NAS MEMPHIS

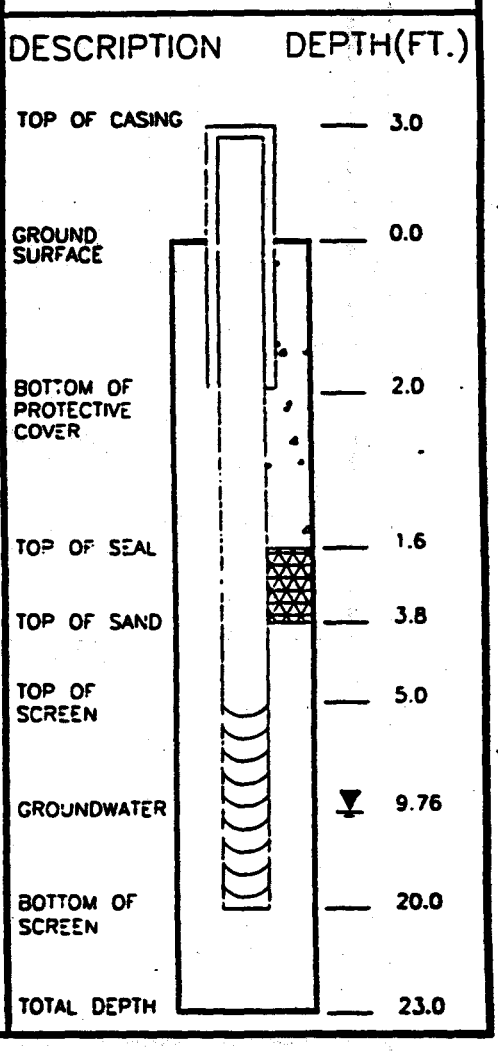
WELL LOCATION USTs 304 & 1239

DATE INSTALLED 11 JULY 94

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.8 FEET
2. WATER SURFACE ELEV. 274.90
   a) DEPTH TO SATURATED ZONE 9.76
3. TOP OF CASING ELEV. 284.66
4. PROTECTIVE CASING (YES) NO
   a) CASING LENGTH 5 FT
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP 3.0 FT
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8 INCH
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 350 lbs. SIZE 10/20 U/C
11. DEPTH TO TOP OF FILTER 3.8 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 1/2 BUCKET
13. DEPTH TO TOP OF SEAL 1.6 FEET
14. TYPE OF GROUT N/A
    GROUT MIXTURE
    METHOD OF PLACEMENT
15. COMMENTS ANNULUS ABOVE SEAL FILLED WITH CONCRETE DURING PAD CONSTRUCTION.

INSTALLATION DESCRIPTION



FACILITY I.D. 0-791709
JOB NUMBER CTO-0080

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-0080

(N001LS)
USTs 304 & 1239
MONITORING WELL MEM-80-MW-1
WELL CONSTRUCTION LOG

DATE: 8-16-94 | DWG NAME: -80MW-1

DESCRIPTION OF SUBSURFACE MATERIALS

DEPTH (FEET)	SAMPLE TYPE	SAMPLE DEPTH	BLOWS/5 FT.	ORGANIC VAPOR (ppm)	
SURFACE - Grass					
		0		0	0.0-3.0' CLAYEY SILT, TAN TO TAN AND LIGHT BROWN, FIRM TO STIFF.
5		3		400	3.0-8.0' CLAYEY SILT, GREYISH BROWN, MOIST, FIRM (WITH STRONG HYDROCARBON ODOR).
10		8		297	8.0-13.0' CLAYEY SILT, GREYISH BROWN, VERY MOIST, SOFT (WITH STRONG HYDROCARBON ODOR).
		13		126	13.0-14.0' CLAYEY SILT, GREYISH BROWN, SOFT.
15		14.8		328	14.0-14.5' CLAYEY SILT, BROWN, STIFF. 14.5-15.4' CLAYEY SILT, GRAYISH BROWN, SOFT. 15.4-18.4' SILTY CLAY, DARK BROWN, FIRM.
		18		35	18.0-20.5' CLAYEY SILT TO SILTY CLAY, BROWN, MOIST, FIRM.
20		20.5		13	20.5-23.0' SILTY CLAY, TAN MOTTLED YELLOW TAN, FIRM TO STIFF
25					DISCONTINUED BORING AT 23.0 FEET.
30					

Boring Number	B/MW-1
Facility Name	North Fuel Farm (Building N-94) Nas Memphis, Millington, TN
Facility I.D.	0-791709
E/H&H Geologist License #	Jeffery L. Albert TN 1083
Drilling Subcontractor	Tristate Testing Services, Inc. 6756 Buckles Cove Memphis, TN
Drilling Method	3.25-inch HSA
Sampler Type	CME 5-foot CS
Time/Date Start	1325/071194
Time/Date Finish	1425/071194

ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS
CTO-0080

SOIL BORING B/MW-1
UST's 304 & 1239
MILLINGTON, TN (N001LS)
DATE INSTALLED: 7/11/1994 PROJ. #: CTO0080

DATE: 8/4/1994 DWG NAME: CTOS

WELL CONSTRUCTION LOG. MEM-80-MW-2

NAS MEMPHIS

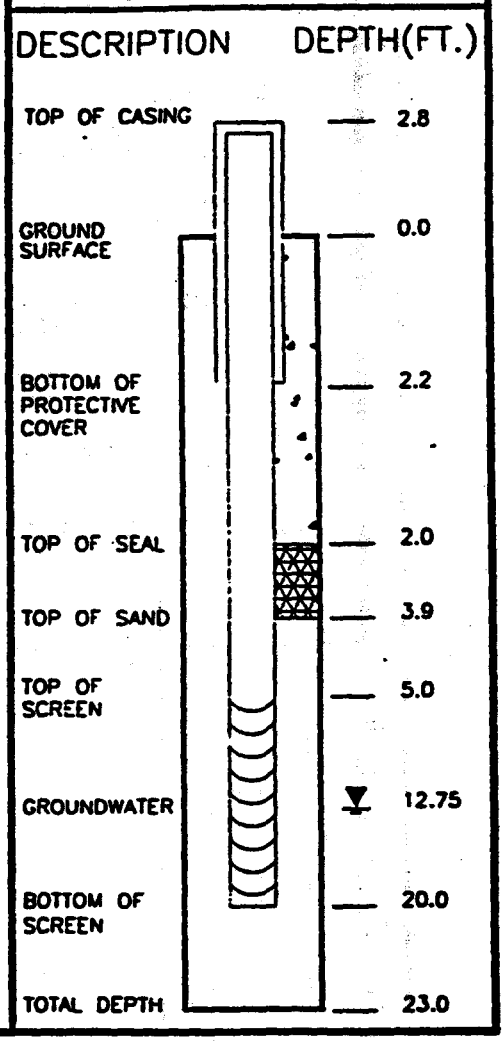
WELL LOCATION USTs 304 & 1239

DATE INSTALLED 11 JULY 94

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.45 FEET
2. WATER SURFACE ELEV. 272.19
   a) DEPTH TO SATURATED ZONE 12.75
3. TOP OF CASING ELEV. 284.94
4. PROTECTIVE CASING (YES) NO
   a) CASING LENGTH 5 FT
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP 3.0 FT
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8 INCH
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 417 lbs. SIZE 10/20 U/C
11. DEPTH TO TOP OF FILTER 3.9 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 1/2 BUCKET
13. DEPTH TO TOP OF SEAL 2.2 FEET
14. TYPE OF GROUT N/A
    GROUT MIXTURE
    METHOD OF PLACEMENT
15. COMMENTS ANNULUS ABOVE SEAL FILLED WITH CONCRETE DURING PAD CONSTRUCTION.

INSTALLATION DESCRIPTION



FACILITY I.D. 0-791709
JOB NUMBER CTO-0080

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-0080

(N002LS)
USTs 304 & 1239
MONITORING WELL MEM-80-MW-2
WELL CONSTRUCTION LOG

DATE: 08-16-94 | DWG NAME: -80MW-2

DESCRIPTION OF SUBSURFACE MATERIALS

SURFACE - Grass

DEPTH (FEET)	SAMPLE TYPE	SAMPLE DEPTH	BLOWS/.5 FT.	ORGANIC VAPOR (ppm)	
		0		4	0.0-1.0' CLAYEY SILT, TAN WITH CONCRETE FRAGMENTS (FILL). 1.0-3.4' CLAYEY SILT, TAN MOTTLED GREY AND BLACK, STIFF.
		3.4		421	3.4-5.8' CLAYEY SILT, GRAYISH BROWN, MOIST, FIRM (WITH HYDROCARBON ODOR).
5					
		5.8		102	5.8-8.0' SILTY CLAY, GRAYISH BROWN, MOIST, SOFT (WITH SLIGHT HYDROCARBON ODOR).
		8		275	8.0-10.5' CLAYEY SILT, GREYISH BROWN, MOIST, SOFT.
10					
		10.5		92	
					10.5-15.2' SILTY CLAY, GREYISH BROWN TO TAN MOTTLED GREY, MOIST, SOFT.
		13		27	
15					
		15.5		120	15.2-16.0' SILTY CLAY, GREYISH BROWN, VERY MOIST, SOFT.
					16.0-18.0' SILTY CLAY, DARK BROWN, MOIST, FIRM.
		18		234	18.0-20.5' SILTY CLAY, DARK BROWN, MOIST, FIRM (WITH STRONG HYDROCARBON ODOR).
20					
		20.5		136	20.5-23.0' SILTY CLAY, BROWN, MOIST, FIRM (WITH HYDROCARBON ODOR).
					DISCONTINUED BORING AT 23.0 FEET.
25					
30					

Boring Number	B/MW-2
Facility Name	North Fuel Farm (Building N-94) Nas Memphis, Millington, TN
Facility I.D.	0-791709
E/H&H Geologist License #	Jeffery L. Albert TN 1083
Drilling Subcontractor	Trietate Testing Services, Inc. 6756 Buckles Cove Memphis, TN
Drilling Method	3.25-inch HSA
Sampler Type	CME 5-foot CS
Time/Date Start	1520/071194
Time/Date Finish	1615/071194

ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS
CTO-0080

SOIL BORING B/MW-2
UST's 304 & 1239
MILLINGTON, TN (N002LS)
DATE INSTALLED: 7/11/1994 PROJ. #: CTO[illegible]

DATE: 8/4/1994 DWG NAME: CTO[illegible]

WELL CONSTRUCTION LOG. MEM-80-MW-3

NAS MEMPHIS

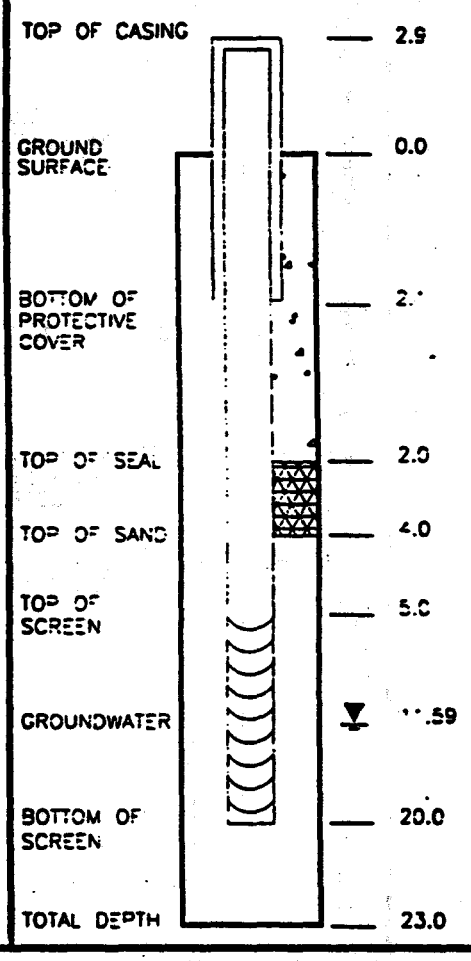
WELL LOCATION USTs 304 & 1239

DATE INSTALLED 12 JULY 94

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.6 FEET
2. WATER SURFACE ELEV. 274.34
   a) DEPTH TO SATURATED ZONE 11.59
3. TOP OF CASING ELEV. 285.93
4. PROTECTIVE CASING (YES) NO
   a) CASING LENGTH 5 FT
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE/TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP 3.0 FT
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8 INCH
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 375 lbs. SIZE 10/20 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 1/2 BUCKET
13. DEPTH TO TOP OF SEAL 2.0 FEET
14. TYPE OF GROUT N/A
    GROUT MIXTURE
    METHOD OF PLACEMENT
15. COMMENTS ANNULUS ABOVE SEAL FILLED WITH CONCRETE DURING PAD CONSTRUCTION.

INSTALLATION DESCRIPTION



FACILITY I.D. 0-791709
JOB NUMBER CTO-0080

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-0080

(N003LS)
USTs 304 & 1239
MONITORING WELL MEM-80-MW-3
WELL CONSTRUCTION LOG

DATE: 08-16-94 | DWG NAME: -80MW-3

DEPTH (FEET)	SAMPLE TYPE	SAMPLE DEPTH	BLOWS/5 FT.	ORGANIC VAPOR (ppm)	DESCRIPTION OF SUBSURFACE MATERIALS
SURFACE – Grass					
		0		30	0.0–3.0' CLAYEY SILT, TAN GRADING TO TAN MOTTLED GREY, SLIGHTLY MOIST, STIFF.
5		3		56	3.0–8.0' CLAYEY SILT, GREYISH BROWN, WITH BLACK STAINING, VERY MOIST, SOFT (WITH STRONG HYDROCARBON ODOR).
10		8		48	8.0–13.0' CLAYEY SILT, GREYISH BROWN, VERY MOIST, SOFT (WITH STRONG HYDROCARBON ODOR).
15		13		81	13.0–18.0' CLAYEY SILT, GREYISH BROWN, VERY MOIST, SOFT (WITH STRONG HYDROCARBON ODOR).
20		18		86	18.0–20.5' SILTY CLAY, DARK BROWN, MOIST, FIRM TO STIFF (WITH HYDROCARBON ODOR).
		20.5		12	20.5–23.0' SILTY CLAY, BROWN GRADING TO TAN, MOIST, FIRM TO STIFF (WITH SLIGHT HYDROCARBON ODOR).
25					DISCONTINUED BORING AT 23.0 FEET.
30					

Boring Number	B/MW-3
Facility Name	North Fuel Farm (Building N-94) Nas Memphis, Millington, TN
Facility I.D.	0-791709
E/H&H Geologist License #	Jeffery L. Albert TN 1083
Drilling Subcontractor	Tristate Testing Services, Inc. 6756 Buckles Cove Memphis, TN
Drilling Method	3.25-inch HSA
Sampler Type	CME 5-foot CS
Time/Date Start	0830/071294
Time/Date Finish	0915/071294

ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS
CTO-0080

SOIL BORING B/MW-3
UST's 304 & 1239
MILLINGTON, TN (N002LS)
DATE INSTALLED: 7/12/1994 PROJ. #: CT[illegible]

DATE: 8/4/1994 DWG NAME: CTO[illegible]-3

WELL CONSTRUCTION LOG. N-MW-1

NAS MEMPHIS UST EAR

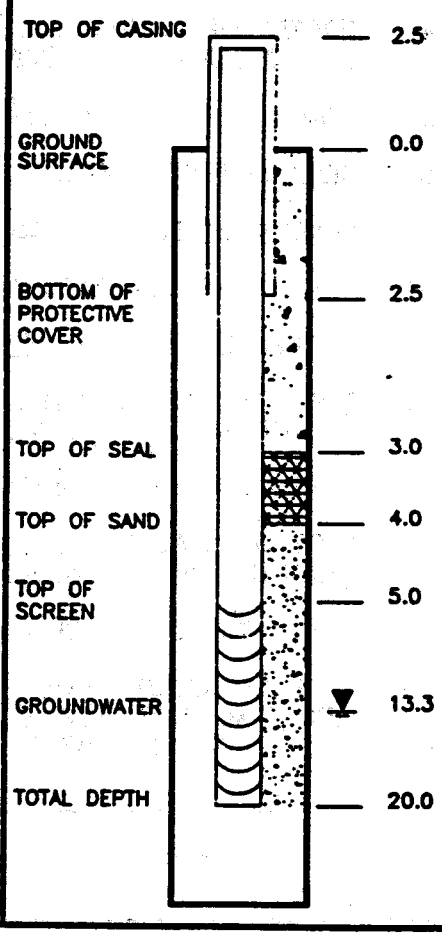
WELL LOCATION BLDG. N-126

DATE INSTALLED 13 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 273.21 (7/20/93)
   a) DEPTH TO SATURATED ZONE 13.3 FEET
3. TOP OF CASING ELEV. 285.95
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS UPGRADIENT WELL

INSTALLATION DESCRIPTION



JOB NUMBER 067-C0109

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

BUILDING N-126
MONITORING WELL N-MW-1
WELL CONSTRUCTION LOG
(NF01LS)

DATE: 09/27/93 | DWG. NAME: 067NWC1

WELL CONSTRUCTION LOG. N-MW-2

NAS MEMPHIS UST EAR

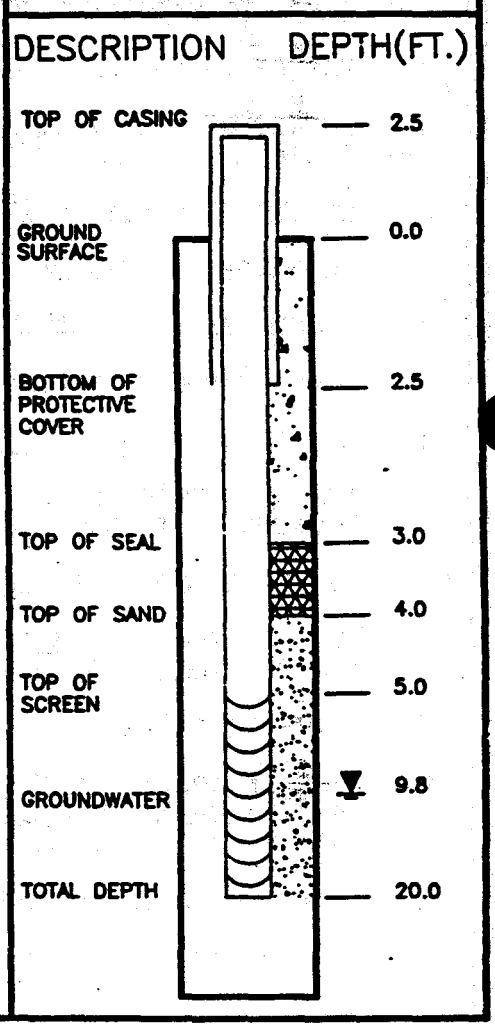
WELL LOCATION BLDG. N-126

DATE INSTALLED 14 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 268.26 (7/20/93)
   a) DEPTH TO SATURATED ZONE 9.8 FEET
3. TOP OF CASING ELEV. 284.76
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS

INSTALLATION DESCRIPTION



JOB NUMBER 067-C0109

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

BUILDING N-126
MONITORING WELL N-MW-2
WELL CONSTRUCTION LOG
(NF02LS)

DATE: 09/27/93 | DWG NAME: 067NWC2

WELL CONSTRUCTION LOG. N-MW-3

NAS MEMPHIS UST EAR

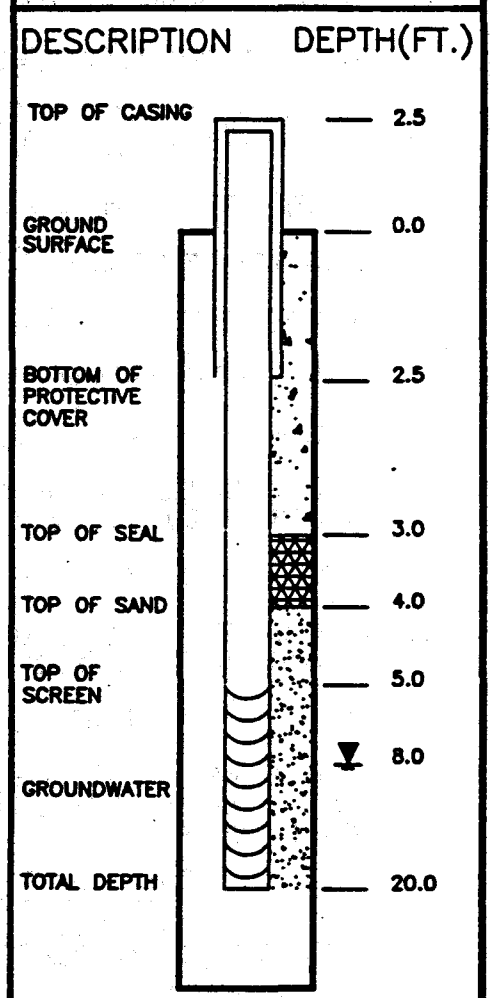
WELL LOCATION BLDG. N-126

DATE INSTALLED 13 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 269.82 (7/20/93)
   a) DEPTH TO SATURATED ZONE 9.8 FEET
3. TOP OF CASING ELEV. 285.90
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS

INSTALLATION DESCRIPTION



JOB NUMBER 067-C0109

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

BUILDING N-126
MONITORING WELL N-MW-3
WELL CONSTRUCTION LOG
(NF03LS)

DATE: 09/27/93 | DWG NAME: 067NWC3

WELL CONSTRUCTION LOG. N-MW-4

NAS MEMPHIS UST EAR

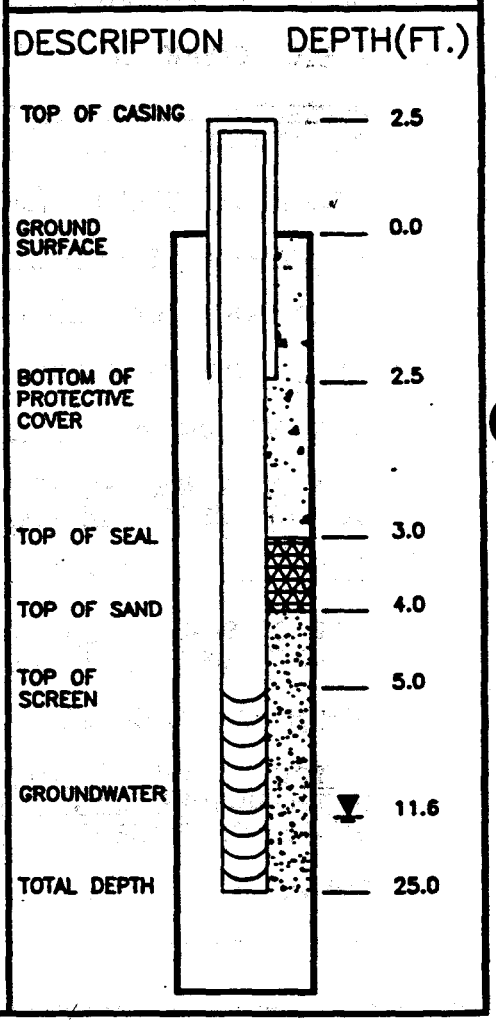
WELL LOCATION BLDG. N-126

DATE INSTALLED 14 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 276.23 (7/20/93)
   a) DEPTH TO SATURATED ZONE 11.6 FEET
3. TOP OF CASING ELEV. 286.53
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 20.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 25.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 25.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 714 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS TOTAL DEPTH DRILLED TO 25.0 FEET DUE TO APPROXIMATE 3 TO 4 FOOT INCREASE IN TOPOGRAPHIC SURFACE ELEVATION IN RELATION TO OTHER WELLS.

INSTALLATION DESCRIPTION



JOB NUMBER 067-C0109

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

BUILDING N-126
MONITORING WELL N-MW-4
WELL CONSTRUCTION LOG
(NF04LS)

DATE: 11/17/93 | DWG NAME: 067NWC4

WELL CONSTRUCTION LOG. N-MW-5

NAS MEMPHIS UST EAR

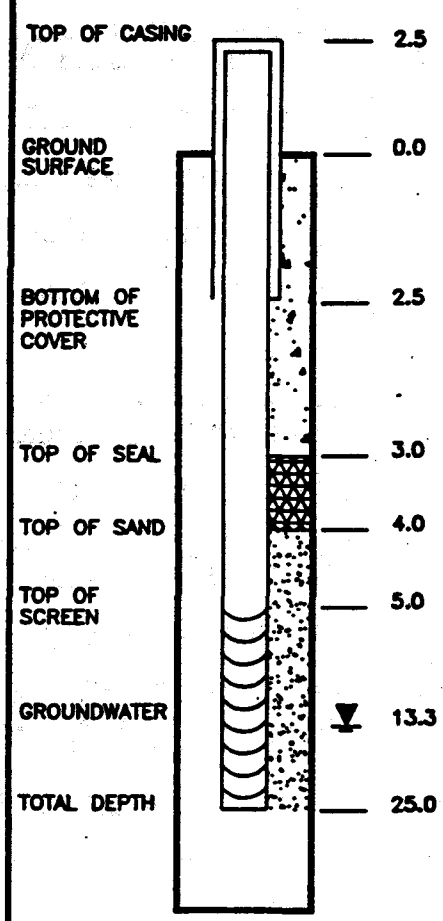
WELL LOCATION BLDG. N-126

DATE INSTALLED 13 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 266.01 (7/20/93)
   a) DEPTH TO SATURATED ZONE 13.3 FEET
3. TOP OF CASING ELEV. 285.19
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 20.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 25.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 25.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 714 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS EXTRA WELL PLACED IN CONTAMINATION PLUME NEXT TO TANK EXCAVATION

INSTALLATION DESCRIPTION



JOB NUMBER 067-C0109

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

BUILDING N-126
MONITORING WELL N-MW-5
WELL CONSTRUCTION LOG
(NF05LS)

DATE: 11/17/93 | DWG NAME: 067NWC5

WELL CONSTRUCTION LOG. N-MW-6

NAS MEMPHIS UST EAR

WELL LOCATION BLDG. N-126

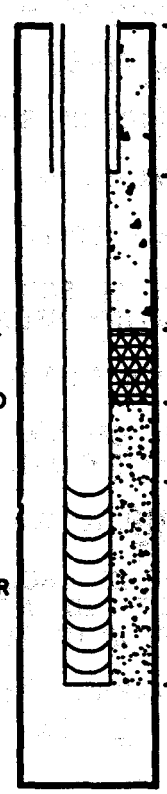
DATE INSTALLED 15 JULY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 0 FEET
2. WATER SURFACE ELEV. 268.28 (7/20/93)
   a) DEPTH TO SATURATED ZONE 13.3 FEET
3. TOP OF CASING ELEV. 281.95
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS ASSUMED DOWNGRADIENT WELL

INSTALLATION DESCRIPTION

DESCRIPTION	DEPTH(FT.)
GROUND SURFACE	0.0
BOTTOM OF PROTECTIVE COVER	2.5
TOP OF SEAL	3.0
TOP OF SAND	4.0
TOP OF SCREEN	5.0
GROUNDWATER	13.3
TOTAL DEPTH	20.0



JOB NUMBER 067-C0109

ENVIRONMENTAL
ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

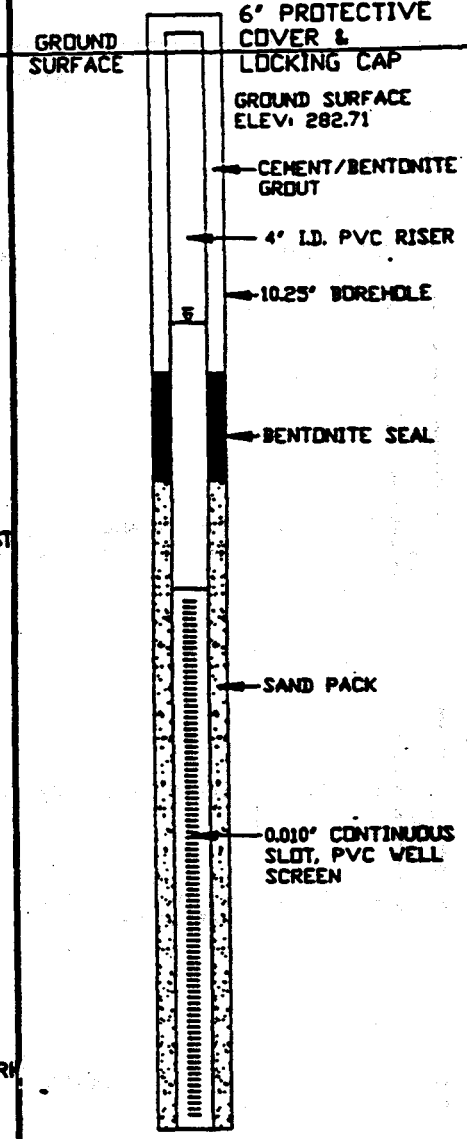
BUILDING N-126
MONITORING WELL N-MW-6
WELL CONSTRUCTION LOG
(NF06LS)

DATE: 09/27/93 | DWG NAME: 067NWC6

DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	PID (PPM)	DESCRIPTION OF SUBSURFACE MATERIALS
				BROWN SILTY CLAYEY LOAM
5	SS	83	0.0	BROWN AND GRAY MOTTLED, PLASTIC SILTY CLAY
10	SS	92	0.0	BROWN AND GRAY MOTTLED, PLASTIC SILTY CLAY; SLIGHTLY MOIST
15	SS	100	0.0	BROWN AND GRAY MOTTLED, VERY PLASTIC SILTY CLAY; WET
20	SS	100	0.0	BROWN AND GRAY MOTTLED, VERY PLASTIC SILTY CLAY WITH DARK GRAY CLAY AT 19.5'; DRIPPING WET
25				

BOREHOLE TERMINATED @ 20'
MONITORING WELL INSTALLED 1/8/92

WELL CONSTRUCTION DETAILS



Environmental and Safety Designs, Inc.
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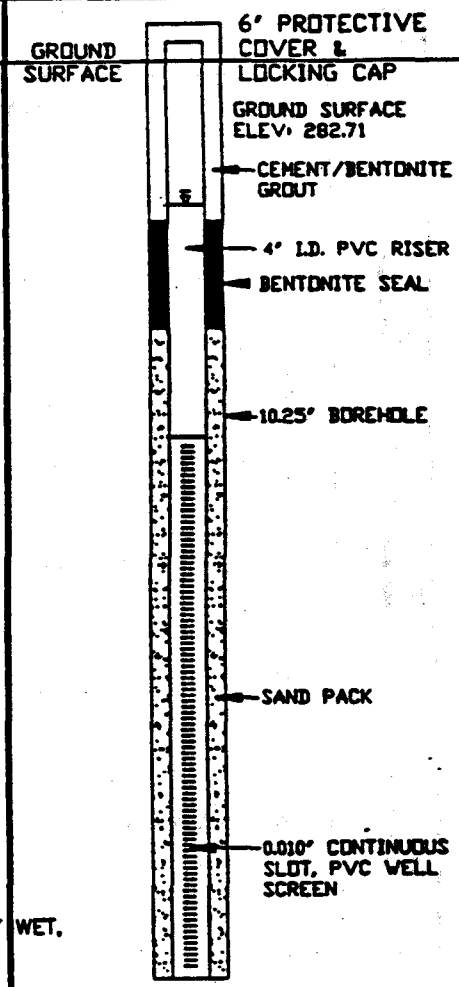
BORING LOG AND CONSTRUCTION DETAILS OF MW-5

(N9405ES)

DATE: 02/10/92 | DWG NAME: NASMEM5

DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	PID (PPM)	DESCRIPTION OF SUBSURFACE MATERIALS
				BROWN SILTY CLAYEY LOAM
5	SS	71	0.0	GRAY AND BROWN MOTTLED PLASTIC SILTY CLAY
10	SS	100	0.0	BROWN AND GRAY, SLIGHTLY SILTY AND SANDY, MOTTLED PLASTIC CLAY; WET; WATER IS RISING IN BOREHOLE
15	SS	100	0.0	BROWN AND GRAY, SILTY, LOOSE, MOTTLED SILTY CLAY; WET
	SS	100	0.0	BROWN AND GRAY, SILTY, MOTTLED SILTY CLAY; PARTS ARE VERY WET, PARTS ARE DRY
20				BOREHOLE TERMINATED @ 17' MONITORING WELL INSTALLED 1/8/92
25				

WELL CONSTRUCTION DETAILS



Environmental and Safety Designs, Inc.

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BORING LOG AND CONSTRUCTION DETAILS OF MW-6

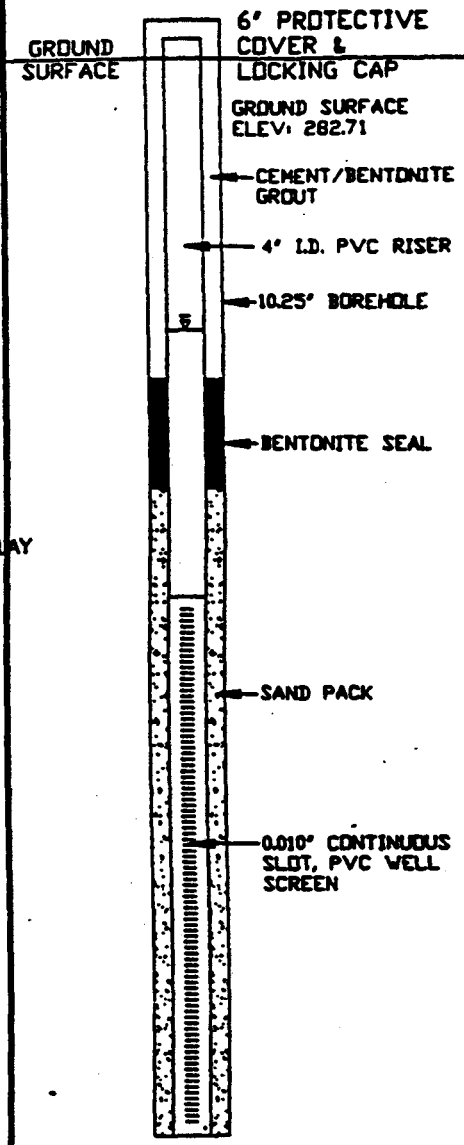
(n9406LS)

DATE: 02/10/92

DWG NAME: NASMEM6

DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	PID (PPM)	DESCRIPTION OF SUBSURFACE MATERIALS
				BROWN SILTY LOAM AND GRAVEL – CLEAN FILL
5	SS	83	0.0	BLACK, BROWN, AND GRAY MOTTLED SEMI-PLASTIC SILTY CLAY
10	SS	100	0.0	GRAY WITH SOME BLACK AND BROWN MOTTLED PLASTIC SILTY CLAY
15	SS	100	0.0	GRAY AND BROWN MOTTLED PLASTIC SILTY CLAY; MOIST TO WET
20	SS	100	0.0	TOP 12" ARE MUD-LIKE SILTY BROWN AND GRAY CLAY BOTTOM 12" ARE BROWN AND GRAY PLASTIC SILTY CLAY
25				BOREHOLE TERMINATED @ 20' MONITORING WELL INSTALLED 1/8/92

WELL CONSTRUCTION DETAILS



Environmental and Safety Designs, Inc.

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BORING LOG AND CONSTRUCTION DETAILS OF MW-7

(N9407LS)

DATE: 02/10/92 | DWG NAME: NASMEM7

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

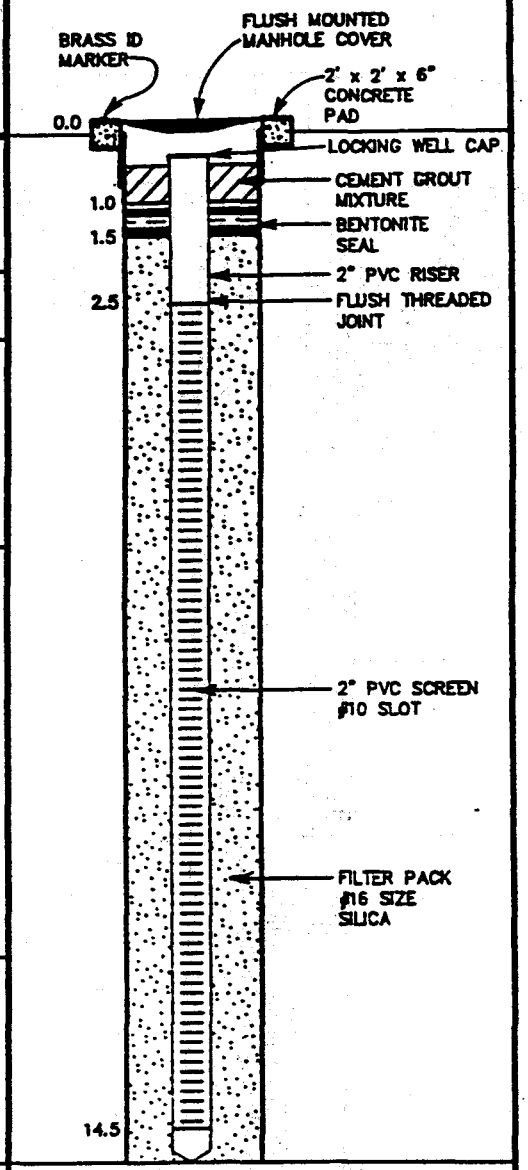
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1239, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1239-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, BROWN
			2.0
			COARSE, GRAVEL
			3.0
			SILT, CLAYEY, BROWN, WITH GRAVEL
5			
			6.0
			SILTY, CLAYEY, GRAY, MOIST
10			
			12.0
			13.3' 24 HOUR WATER LEVEL SILT, CLAYEY, GRAY, WET
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 3, 1990 | Boring Diameter: 6.75"

Well Completion Date: JAN. 3, 1990 | Ground Elevation:

Well Development Date: N.A. | Top of Casing Elevation:

Drilling Method: POWER AUGER | Driller: B. ELDER

Depth to Water: 13.3' | Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

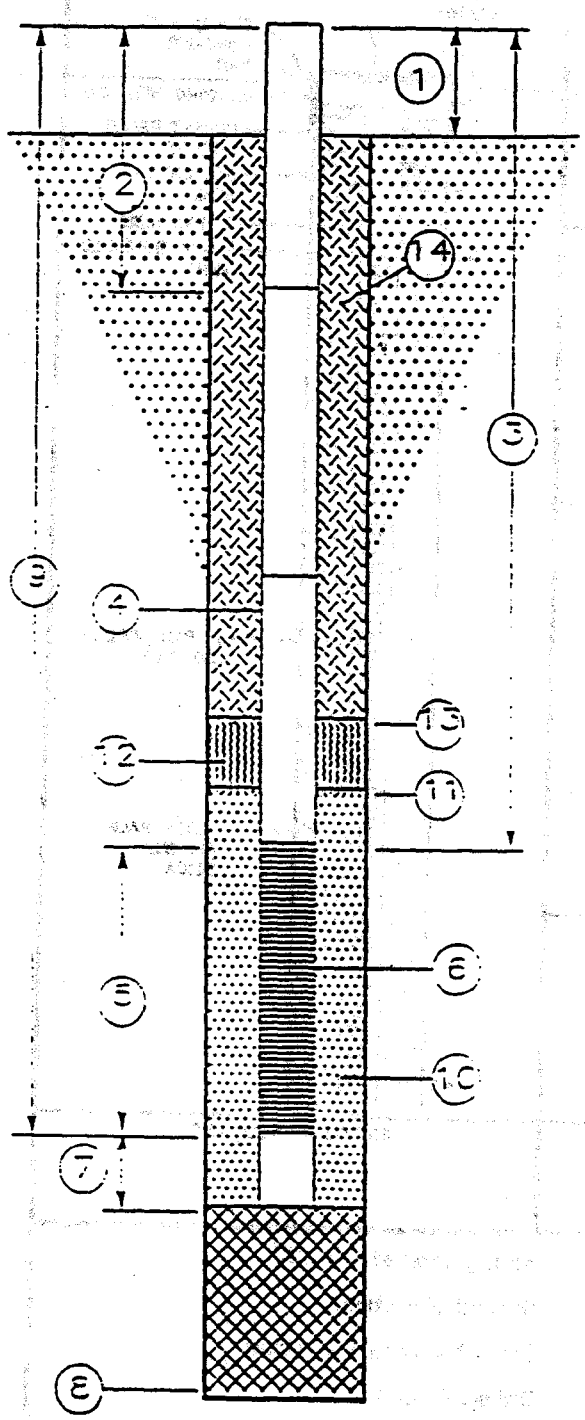
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1239-1

DATE OF INSTALLATION 1-3-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

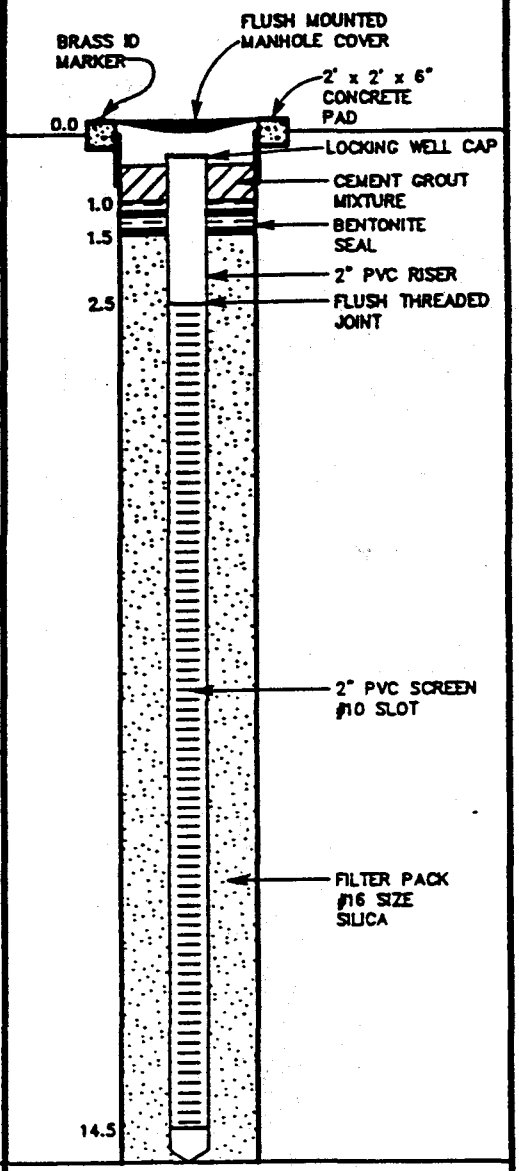
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION. TANK SYSTEM 1239, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1239-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, BROWN
			2.0
			COARSE GRAVEL
			3.0
5			SILT, CLAYEY, BROWN
			9.0
10			SILT, CLAYEY, GRAY, MOIST SLIGHT HYDROCARBON ODOR
			12.5' 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 9, 1990
Well Completion Date: JAN. 9, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 12.5'

Boring Diameter: 6.75"
Ground Elevation: 283.28'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

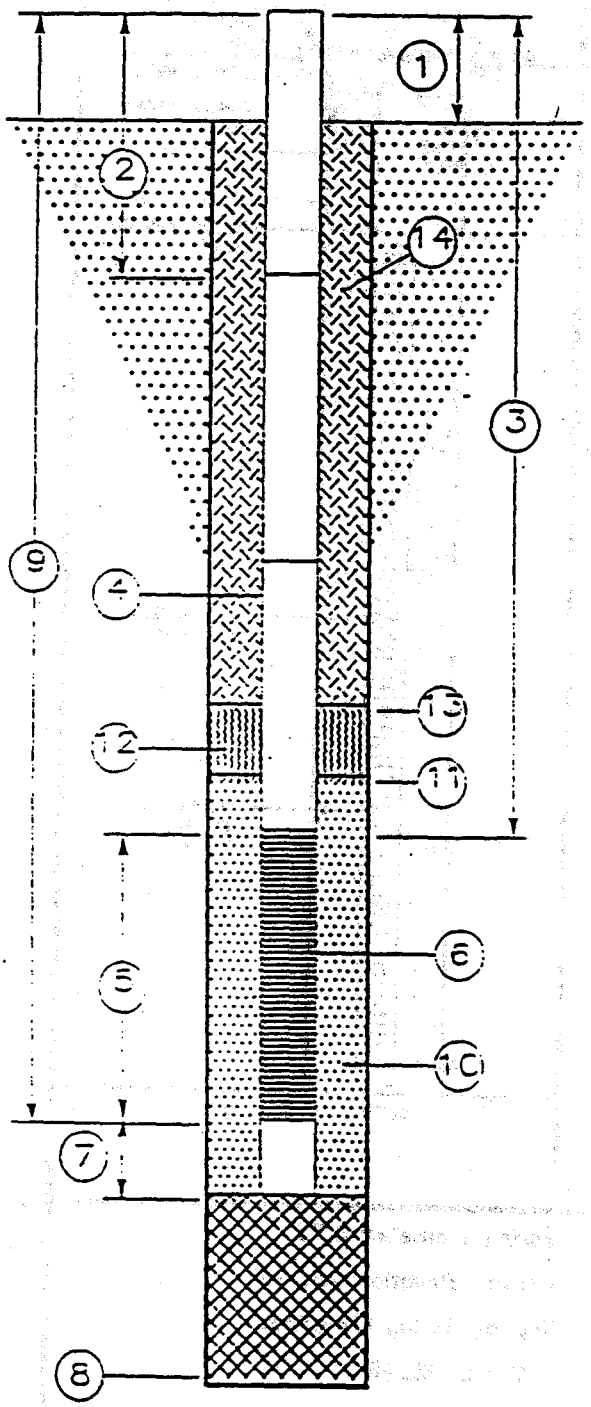
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1239-2

DATE OF INSTALLATION 1-9-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #18 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

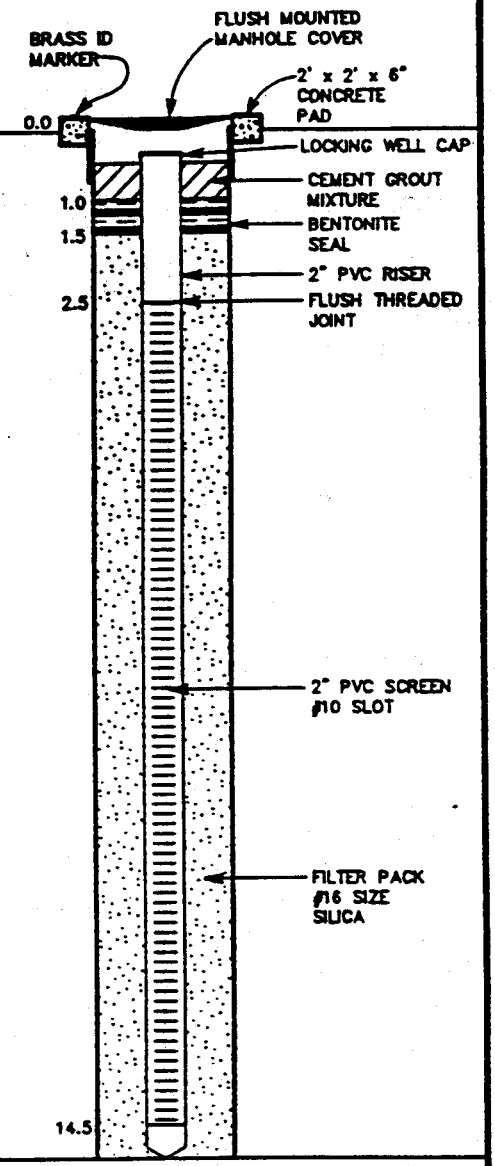
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1239, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T1239-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILTY BROWN
			2.0
			COARSE GRAVEL
			3.0
5			SILT, CLAYEY, BROWN
			9.0
10			SILT, CLAYEY, GRAY, MOIST SLIGHT HYDROCARBON ODOR
			13.8' 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 9, 1990 | Boring Diameter: 6.75'

Well Completion Date: JAN. 9, 1990 | Ground Elevation: 283.64'

Well Development Date: N.A. | Top of Casing Elevation:

Drilling Method: POWER AUGER | Driller: B. ELDER

Depth to Water: 13.8' | Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

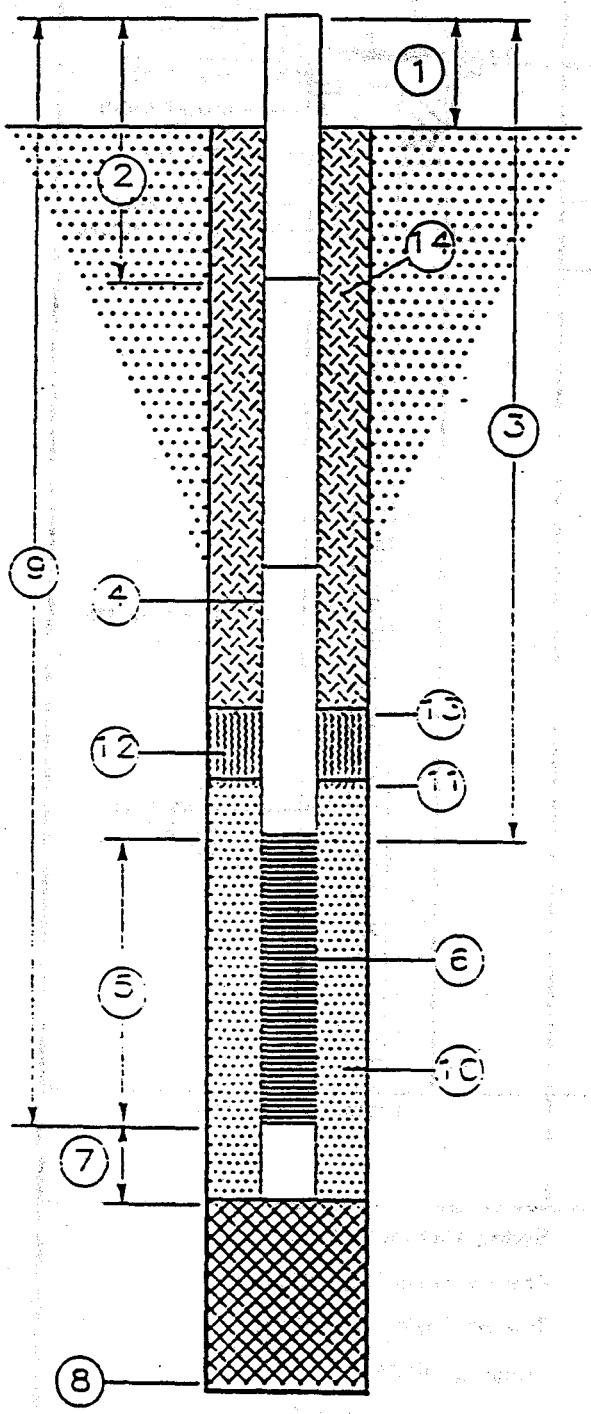
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1239-3

DATE OF INSTALLATION 1-9-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 [illegible]
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING

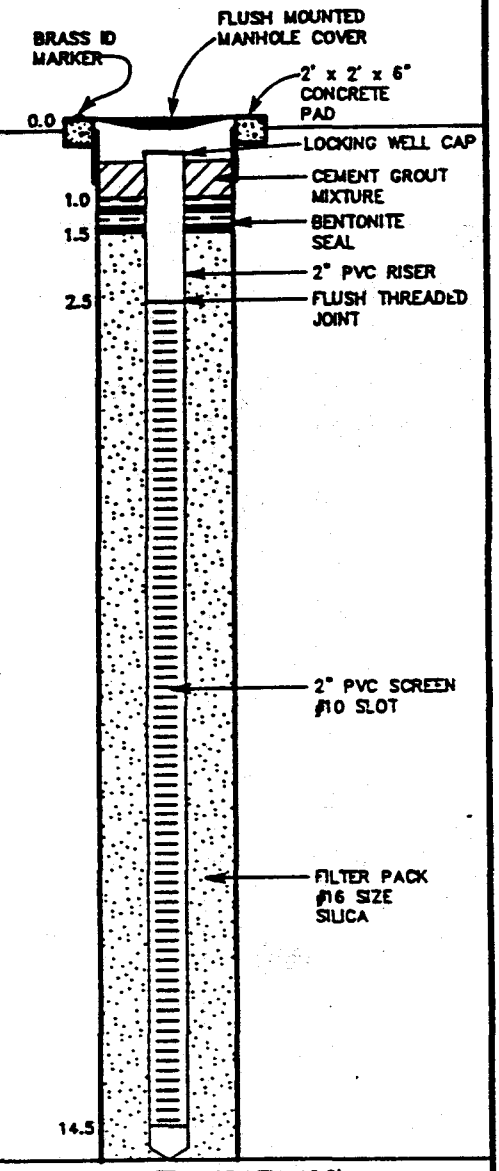
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1242, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1242-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, LIGHT BROWN
			4.0
5			CLAYEY, SILTY, BROWN, DRY MODERATE HYDROCARBON ODOR
			7.0
10			SILT, CLAYEY, MOIST MODERATE HYDROCARBON ODOR
15			15.0 TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 4, 1990 | Boring Diameter: 6.75"

Well Completion Date: JAN. 4, 1990 | Ground Elevation: 283.90'

Well Development Date: N.A. | Top of Casing Elevation:

Drilling Method: POWER AUGER | Driller: B. ELDER

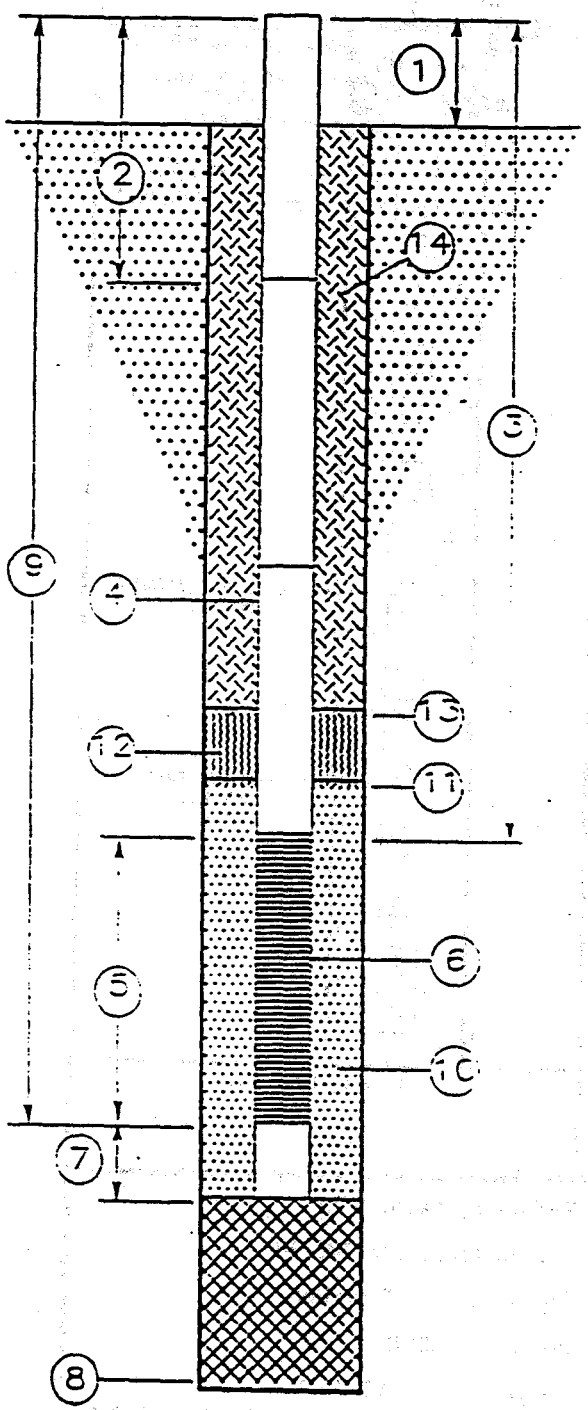
Depth to Water: 14.6' | Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1242-1

DATE OF INSTALLATION 1-4-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft.
   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

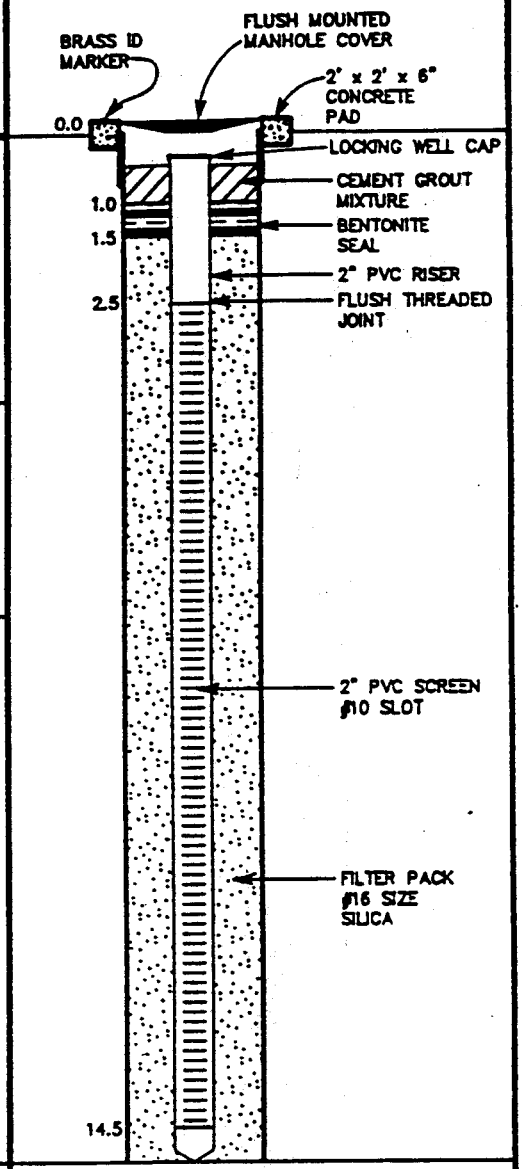
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1242, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1242-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			CLAYEY, SILTY, LIGHT BROWN
			4.0
5			CLAYEY, SILTY, BROWN, MOIST SLIGHT HYDROCARBON ODOR
			7.0
10			SILT, CLAYEY, MOIST MODERATE HYDROCARBON ODOR
			14.6' 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



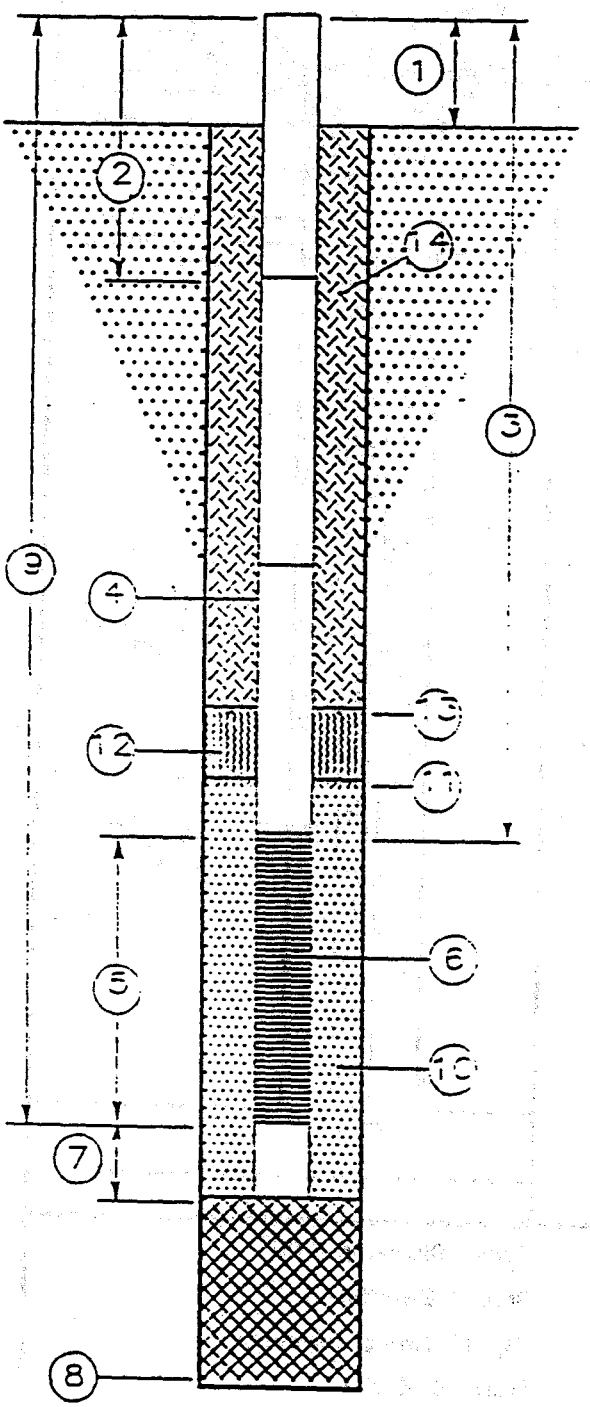
Boring Completion Date: JAN. 4, 1990	Boring Diameter: 8.00"
Well Completion Date: JAN. 4, 1990	Ground Elevation:
Well Development Date: N.A.	Top of Casing Elevation:
Drilling Method: POWER AUGER	Driller: B. ELDER
Depth to Water: N.A.	Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-C068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1242-2

DATE OF INSTALLATION 1-4-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft.
   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

Well Construction Details

Appendix III

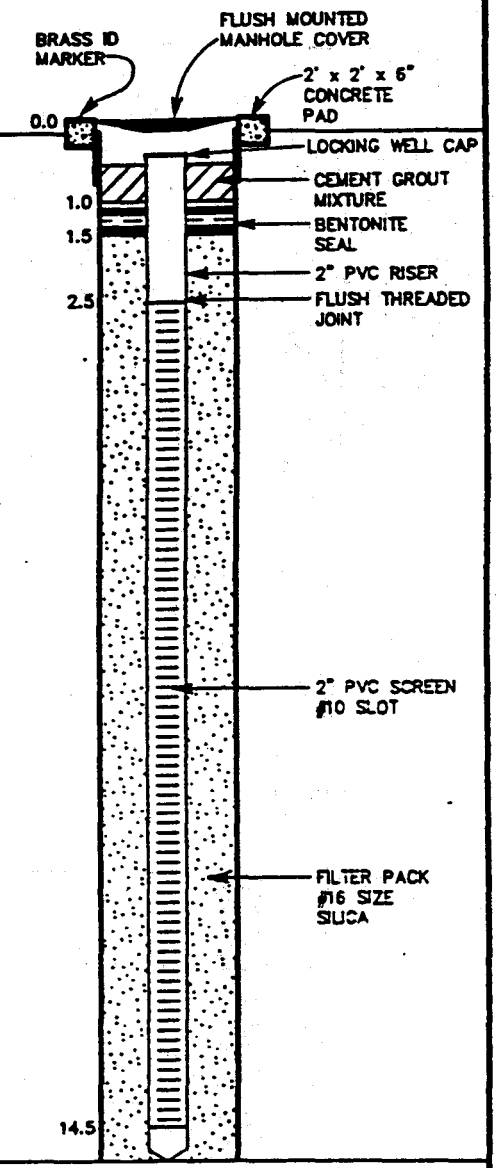
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM T1243, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1243-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, LIGHT BROWN
5			
			8.0
			8.4 24 HOUR WATER LEVEL
10			SILT, CLAYEY, BROWN, MOIST SLIGHT HYDROCARBON OCOR
			15.0
15			TERMINATED @ 15.0

WELL CONSTRUCTION



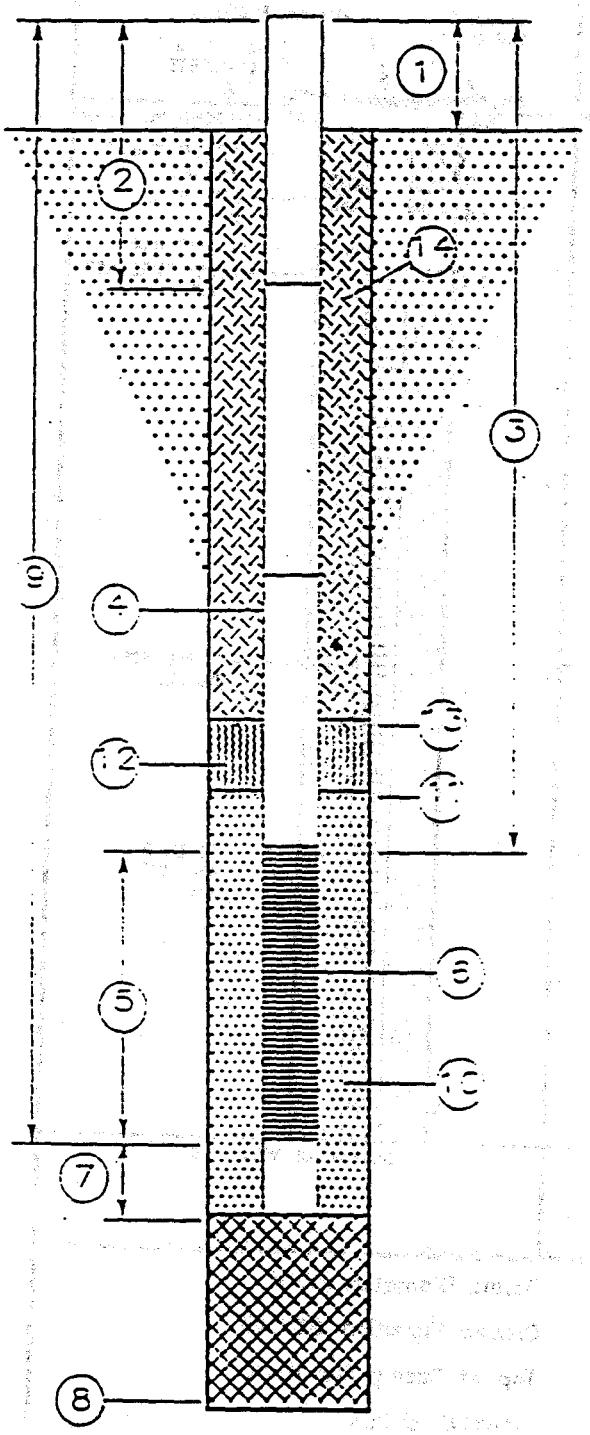
Boring Completion Date: JAN. 5, 1990
Well Completion Date: JAN. 5, 1990
Well Development Date:
Drilling Method: POWER AUGER
Depth to Water: 8.4'

Boring Diameter: 6.75"
Ground Elevation: 284.43'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL NUMBER MEM-T1243-1

DATE OF INSTALLATION 1-5-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft.
   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inc
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

Well Construction Details

Appendix III

Release Detection Manual
MTMC New Orleans, La
April, 1991

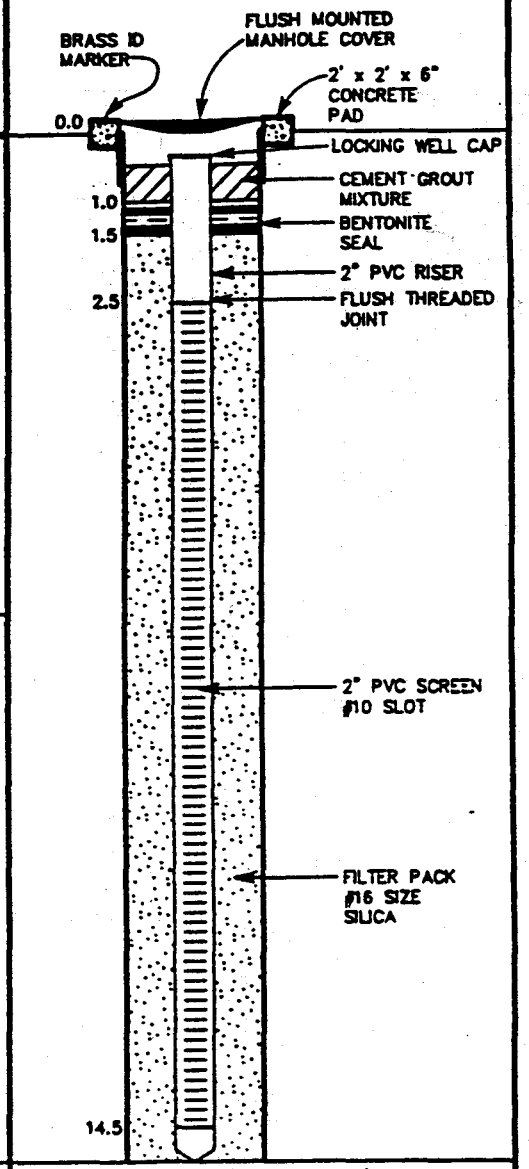
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM T1243, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1243-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
5			SILT, CLAYEY, LIGHT BROWN	
7.0				
8.5			24 HOUR WATER LEVEL	
10			SILT, CLAYEY, GRAY, WET MODERATE HYDROCARBON ODOR	
15.0				
15			TERMINATED @ 15.0	BOTTOM OF WELL 15.0'



Boring Completion Date: JAN. 9, 1990
Boring Diameter: 6.75"
Well Completion Date: JAN. 9, 1990
Ground Elevation: 284.20'
Well Development Date:
Top of Casing Elevation:
Drilling Method: POWER AUGER
Driller: B. ELDER
Depth to Water: 8.5'
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

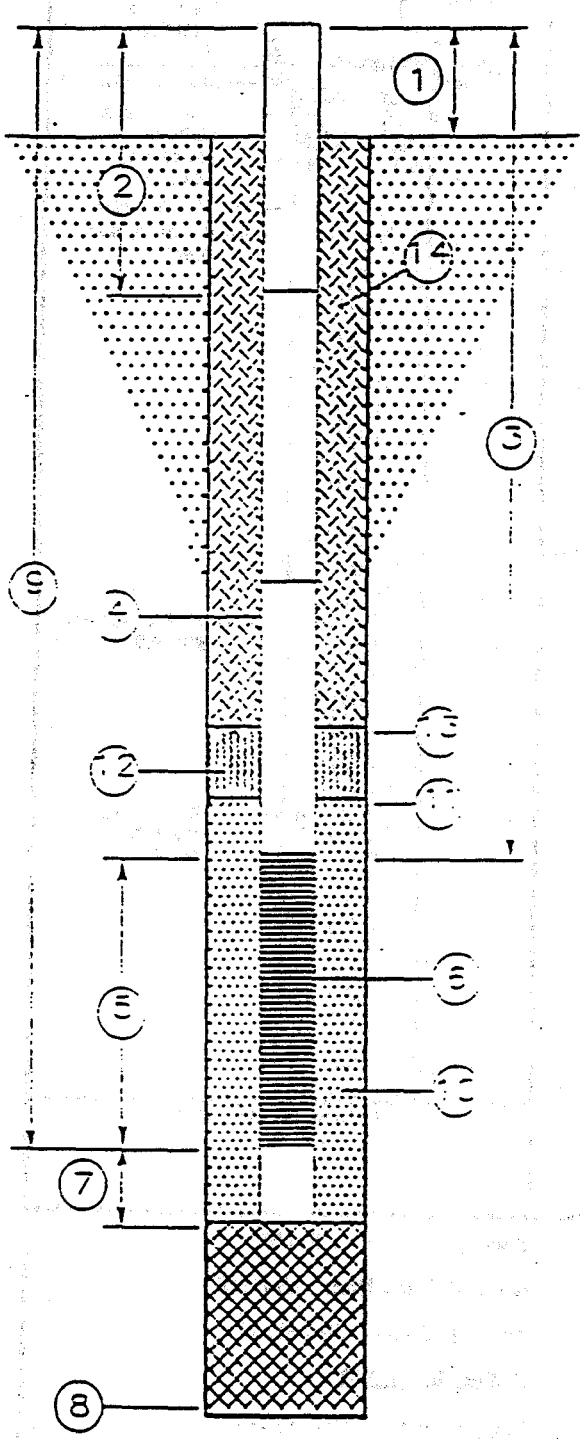
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1243-2

DATE OF INSTALLATION 1/9/90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inc
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #2S U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

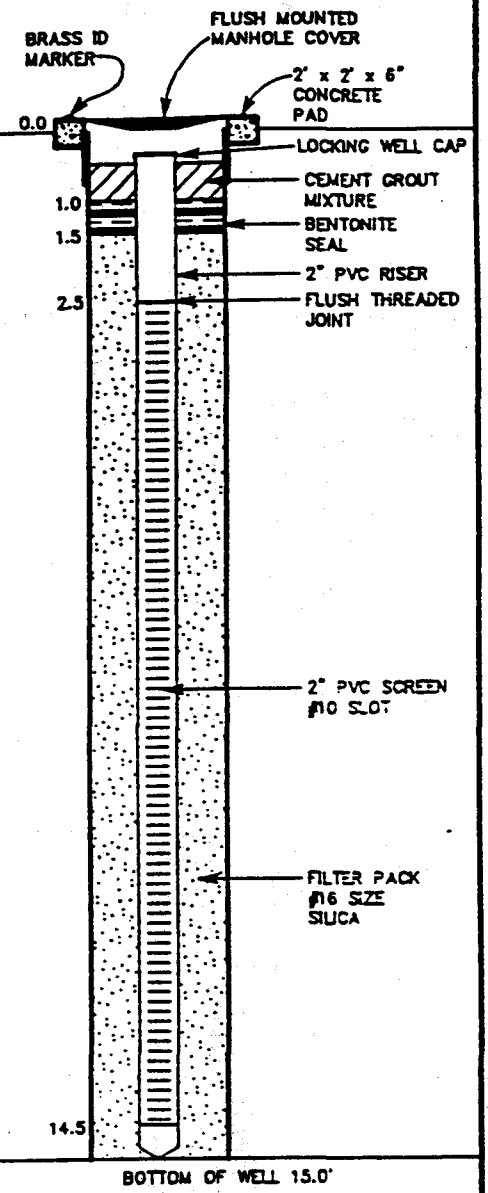
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 301, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T301-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, WITH PEA GRAVEL
			3.0
5			SILT, CLAYEY, GRAY MODERATE HYDROCARBON ODOR
			7.0
10			SILTY, CLAYEY, GRAY, MOIST MODERATE HYDROCARBON ODOR
			12.0
			12.7' 24 HOUR WATER LEVEL
			SILT, CLAYEY, GREEN, WET STRONG HYDROCARBON ODOR
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



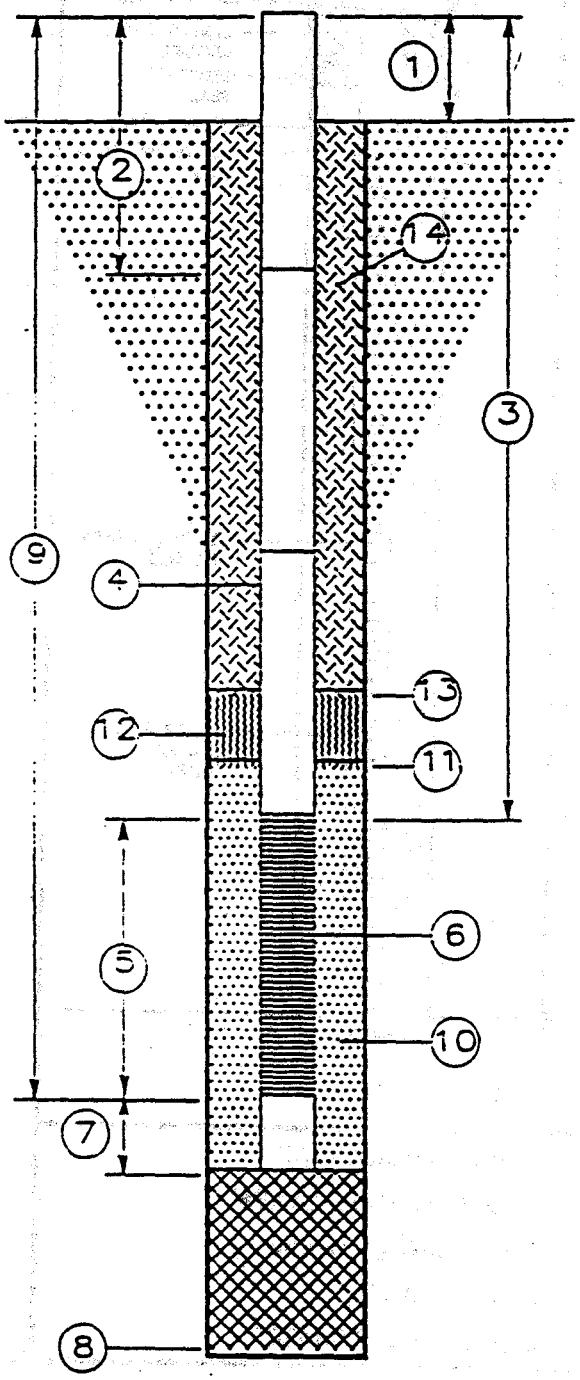
Boring Completion Date: JAN. 5, 1990	Boring Diameter: 6.75"
Well Completion Date: JAN. 5, 1990	Ground Elevation: 283.88'
Well Development Date: N.A.	Top of Casing Elevation:
Drilling Method: POWER AUGER	Driller: B. ELDER
Depth to Water: 12.7'	Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T301-1

DATE OF INSTALLATION 1-15-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 $ft.^3$ Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 $ft.^3$
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES

GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 301, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T301-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			SILT, BROWN (0.0 – 3.0)	0.0 BRASS ID MARKER; FLUSH MOUNTED MANHOLE COVER; 2' x 2' x 6" CONCRETE PAD; LOCKING WELL CAP; CEMENT GROUT MIXTURE; 1.0; 1.5 BENTONITE SEAL; 2" PVC RISER; 2.5 FLUSH THREADED JOINT
5			SILT, CLAYEY, GRAY (3.0 – 6.0)	
10			SILT, CLAYEY, GRAY, MOIST SLIGHT HYDROCARBON ODOR (6.0 – 13.0)	2" PVC SCREEN #10 SLOT; FILTER PACK #16 SIZE SILICA
15			SILT, CLAYEY, GREEN WET SLIGHT HYDROCARBON ODOR (13.0 – 15.0); 14.8 24 HOUR WATER LEVEL; 15.0 TERMINATED @ 15.0	14.5; BOTTOM OF WELL 15.0'

Boring Completion Date: JAN. 9, 1990

Well Completion Date: JAN. 9, 1990

Well Development Date: N.A.

Drilling Method: POWER AUGER

Depth to Water: 14.8'

Boring Diameter: 6.75"

Ground Elevation: 283.63'

Top of Casing Elevation:

Driller: B. ELDER

Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

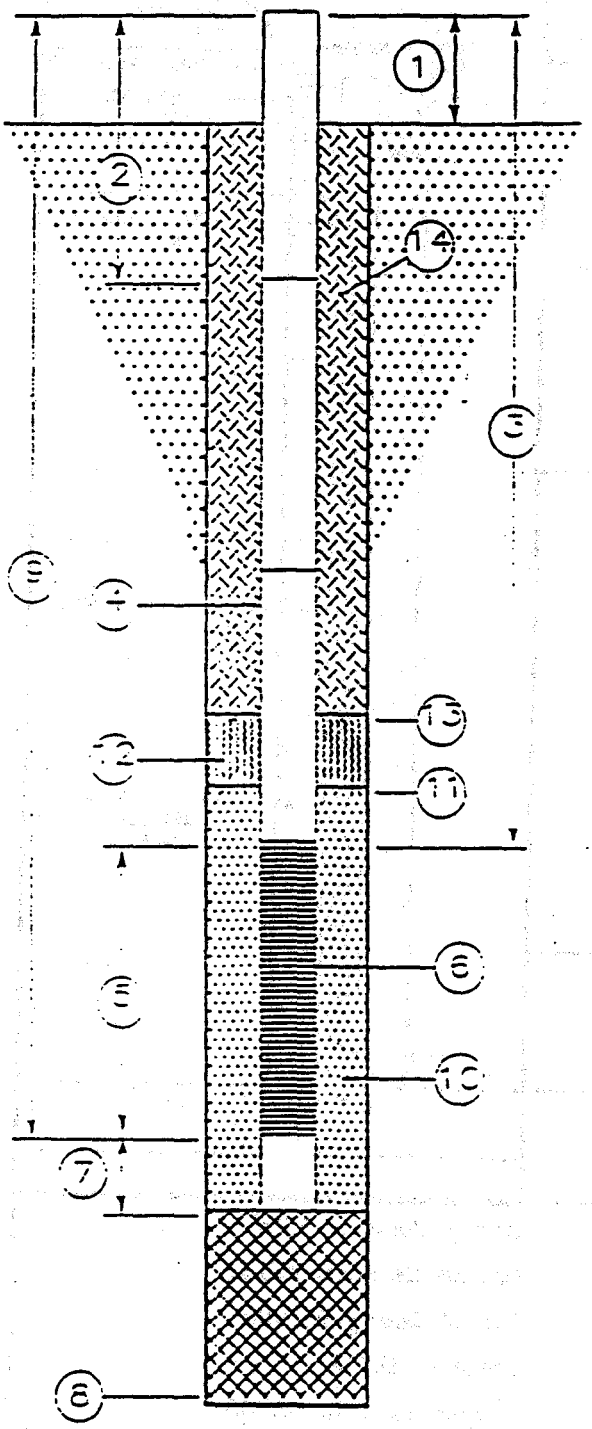
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T301-2

DATE OF INSTALLATION 1/9/90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand.

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

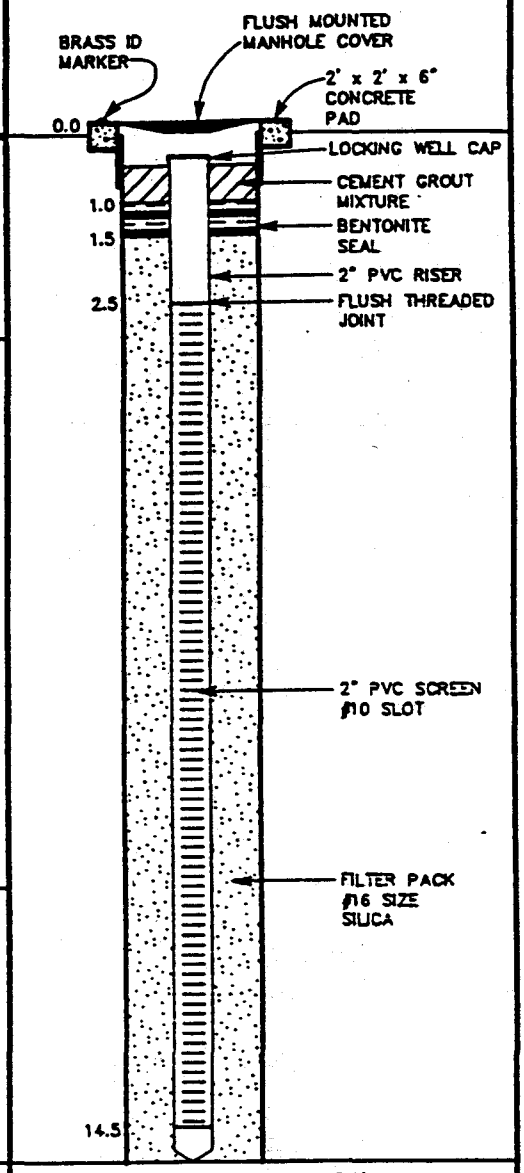
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 301, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T301-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT BROWN
			3.0
5			SILT, CLAYEY, GRAY
10			11.0
			SILT, CLAYEY, GREEN, WET
			13.6' 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 9, 1990
Well Completion Date: JAN. 9, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 13.6'

Boring Diameter: 6.75"
Ground Elevation: 283.55'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

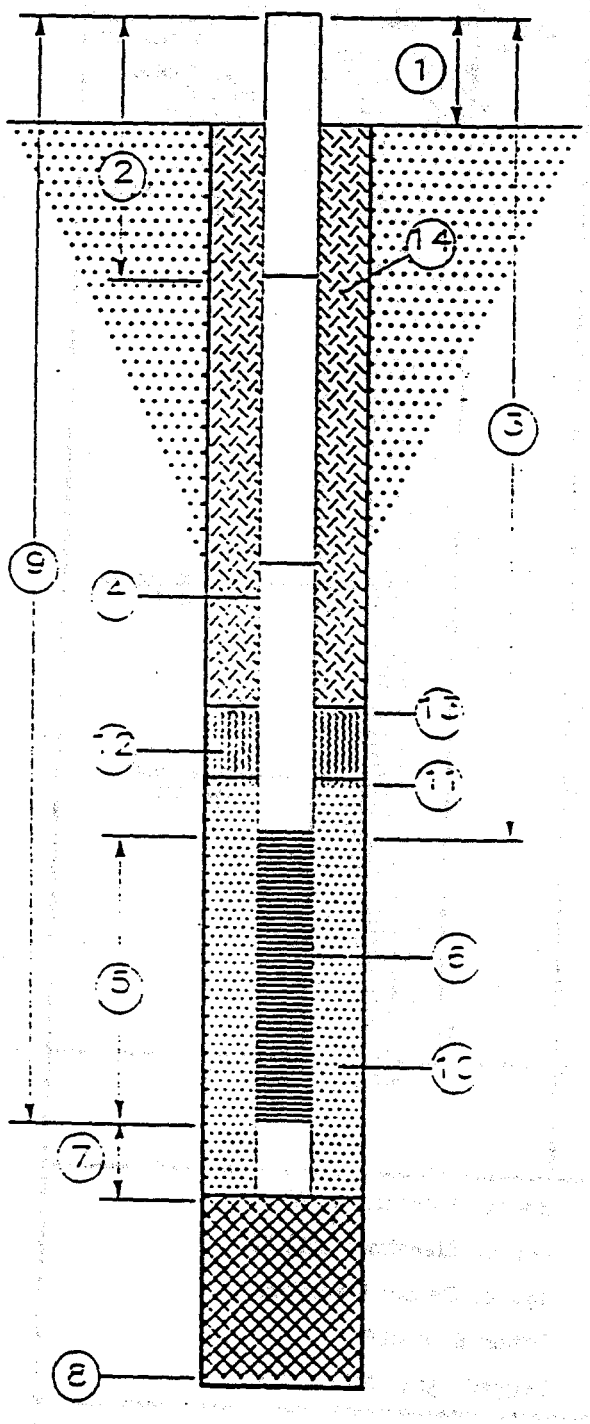
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T301-3

DATE OF INSTALLATION 1-9-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft.

   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

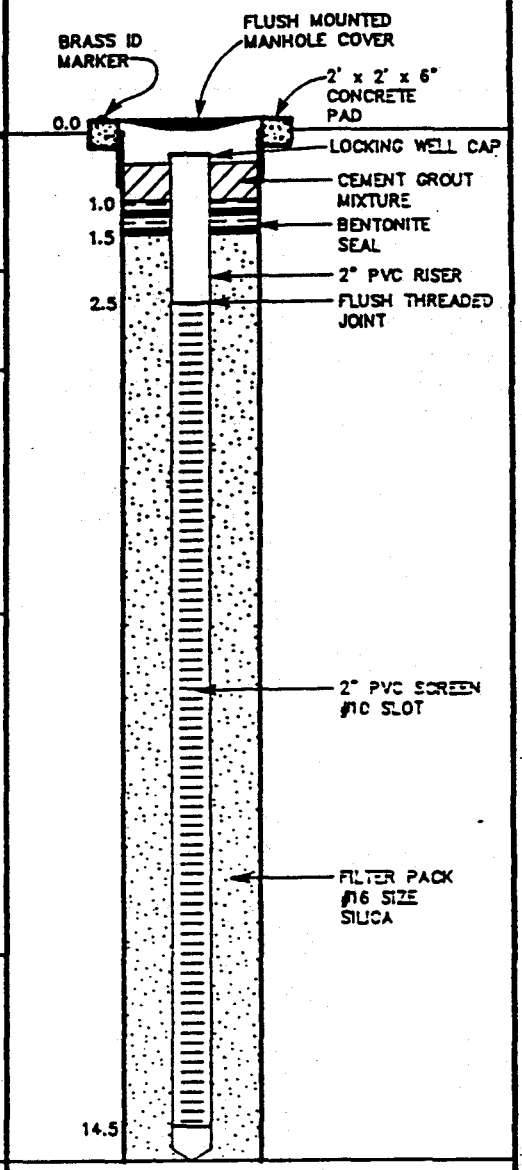
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 304, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T304-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILTY BROWN
			2.0 COARSE GRAVEL
			3.5 SILT, CLAYEY, BROWN, WITH COARSE GRAVEL SLIGHT HYDROCARBON ODOR
5			
			7.0 SILT, CLAYEY, GRAY, MOIST MODERATE HYDROCARBON ODOR
10			
			11.9' 24 HOUR WATER LEVEL
			12.0 SILT, CLAYEY, GRAY, MOIST STRONG HYDROCARBON ODOR
15			15.0 TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 9, 1990 | Boring Diameter: 6.75"

Well Completion Date: JAN. 9, 1990 | Ground Elevation: 284.34'

Well Development Date: N.A. | Top of Casing Elevation:

Drilling Method: POWER AUGER | Driller: B. ELDER

Depth to Water: 11.9' | Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

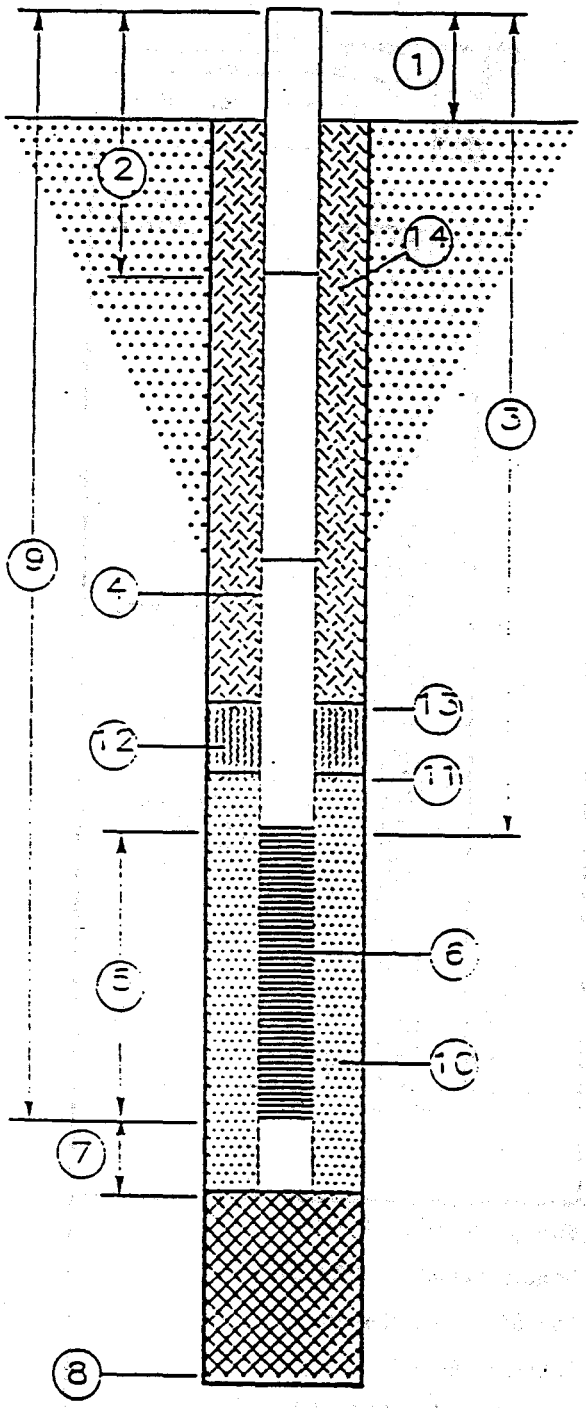
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T304-1

DATE OF INSTALLATION 1/9/90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft.

   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 $ft.^3$ Size #00 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 $ft.^3$
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

Well Construction Details

Appendix III

Release Detection Manual
MTMC New Orleans, La
April, 1991

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

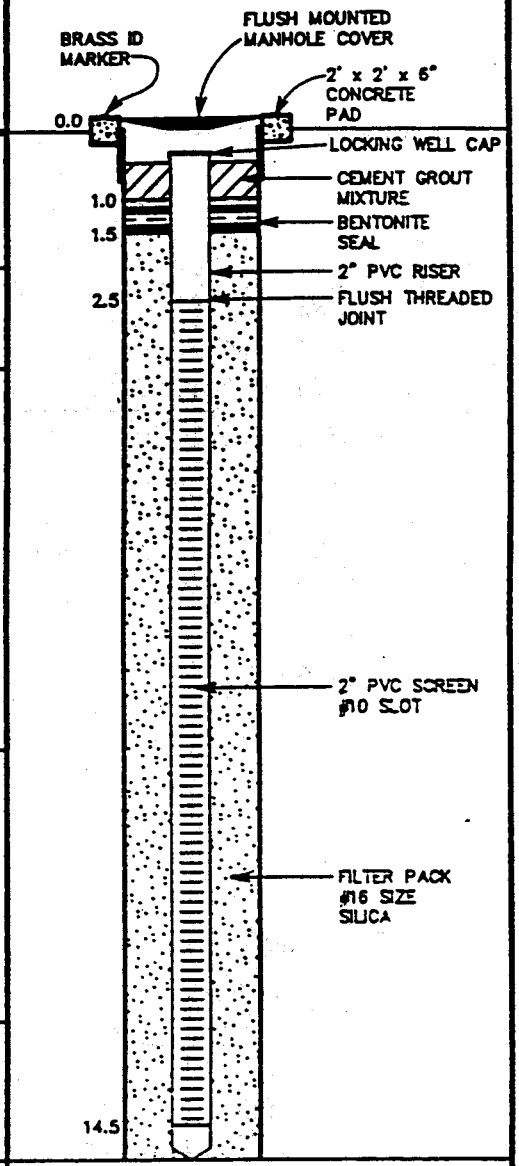
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 304, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T304-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILTY BROWN (2.0)
			COARSE GRAVEL (3.5)
5			SILT, CLAYEY, BROWN (9.0)
10			SILT, CLAYEY, GRAY, MOIST MODERATE HYDROCARBON ODOR
			24 HOUR WATER LEVEL (12.3')
			SILT, CLAYEY, GRAY, WET STRONG HYDROCARBON ODOR (15.0)
15			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 9, 1990
Well Completion Date: JAN. 9, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 12.3'

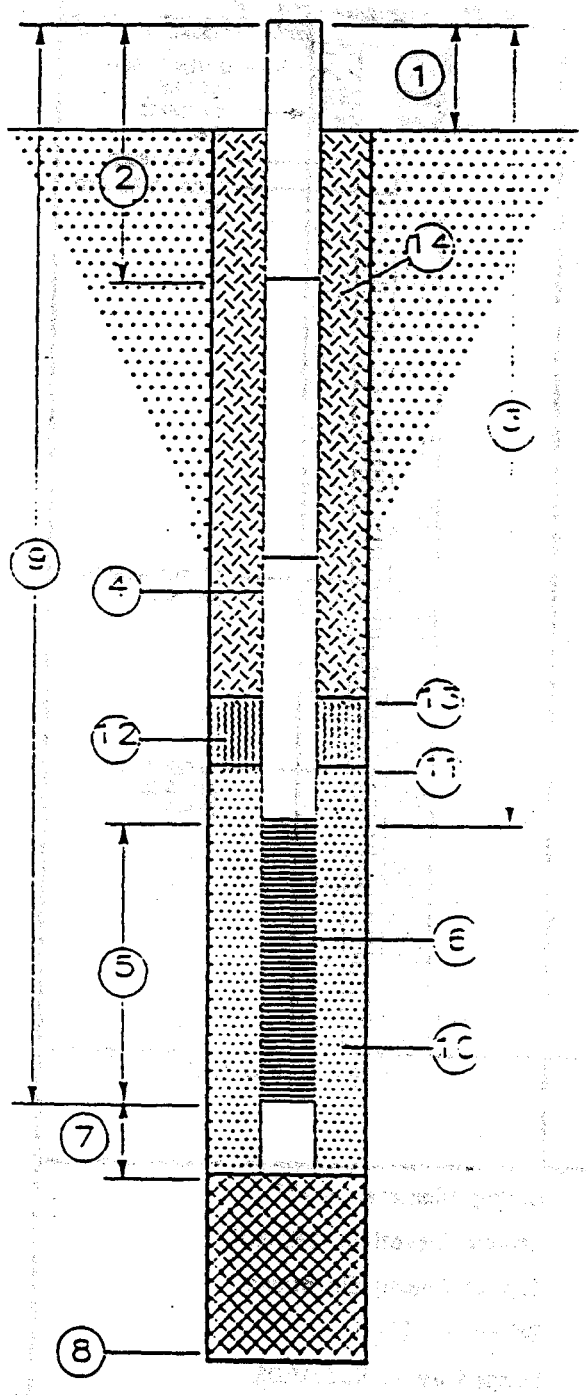
Boring Diameter: 6.75"
Ground Elevation: 283.83'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T304-2

DATE OF INSTALLATION 1-9-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft., 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC [illegible] slot
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter [illegible] inches
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size [illegible] U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

TABLE 2.3
WELL CONSTRUCTION SUMMARY
NSA MID-SOUTH SITE N-6
MILLINGTON, TENNESSEE

Identification	Installation Date	Northing (State Plane)	Easting (State Plane)	Top of Casing Elevation (feet msl)[a/]	Screened Interval (feet bgs)[b/]	Well Diameter (inches)	Stratigraphic Interval[c/]
Injection Wells							
PES-INJ-1S	19-Jul-00	392214.45	815028.46	293.44	55.0 - 65.0	2.0	Upper-Fluvial
PES-INJ-1D	19-Jul-00	392214.45	815028.46	293.44	75.0 - 85.0	2.0	Lower-Fluvial
PES-INJ-2S	20-Jul-00	392219.89	815042.45	293.20	44.8 - 54.8	2.0	Upper-Fluvial
PES-INJ-2D	20-Jul-00	392219.89	815042.45	293.21	65.0 - 75.0	2.0	Lower-Fluvial
PES-INJ-3S	23-Jul-00	392224.65	815056.27	293.09	55.0 - 65.0	2.0	Upper-Fluvial
PES-INJ-3D	23-Jul-00	392224.65	815056.27	293.12	75.0 - 85.0	2.0	Lower-Fluvial
PES-INJ-4S	23-Jul-00	392230.14	815070.41	293.44	45.4 - 55.4	2.0	Upper-Fluvial
PES-INJ-4D	23-Jul-00	392230.14	815070.41	293.40	65.0 - 75.0	2.0	Lower-Fluvial
Monitoring Wells							
PES-MW-1S	18-Jul-00	392115.58	815062.15	293.37	45.3 - 55.3	2.0	Upper-Fluvial
PES-MW-1D	18-Jul-00	392115.58	815062.15	293.33	70.0 - 80.0	2.0	Lower-Fluvial
PES-MW-2S	1-Aug-00	392229.39	815038.32	293.38	55.0 - 65.0	2.0	Upper-Fluvial
PES-MW-2D	1-Aug-00	392229.39	815038.32	293.32	75.0 - 85.0	2.0	Lower-Fluvial
PES-MW-3S	24-Jul-00	392235.18	815052.39	293.39	45.0 - 55.0	2.0	Upper-Fluvial
PES-MW-3D	24-Jul-00	392235.18	815052.39	293.40	65.0 - 75.0	2.0	Lower-Fluvial
PES-MW-4S	21-Jul-00	392241.32	815036.00	293.34	55.0 - 65.0	2.0	Upper-Fluvial
PES-MW-4D	21-Jul-00	392241.32	815036.00	293.34	75.0 - 85.0	2.0	Lower-Fluvial
PES-MW-5S	20-Jul-00	392250.05	815029.07	293.27	45.4 - 55.4	2.0	Upper-Fluvial
PES-MW-5D	20-Jul-00	392250.05	815029.07	293.27	65.0 - 75.0	2.0	Lower-Fluvial
PES-MW-6S	22-Jul-00	392251.69	815045.97	293.28	55.0 - 65.0	2.0	Upper-Fluvial
PES-MW-6D	22-Jul-00	392251.69	815045.97	293.31	75.0 - 85.0	2.0	Lower-Fluvial
PES-MW-7S	21-Jul-00	392273.12	815033.08	293.10	45.0 - 55.0	2.0	Upper-Fluvial
PES-MW-7D	21-Jul-00	392273.12	815033.08	293.08	65.0 - 75.0	2.0	Lower-Fluvial
PES-MW-8S	22-Jul-00	392321.46	815011.22	292.94	55.0 - 65.0	2.0	Upper-Fluvial
PES-MW-8D	22-Jul-00	392321.46	815011.22	292.94	75.3 - 85.3	2.0	Lower-Fluvial
007G15UF	19-Mar-96	392229.59	814956.53	292.91	40.0 - 50.0	2.0	Upper-Fluvial
007G15LF	19-Mar-96	392221.04	814961.17	293.36	90.0 - 100.0	2.0	Lower-Fluvial

[a/] feet msl indicates elevation in feet mean sea level.

SWMU 8

EnSafe/Allen & Hoshall

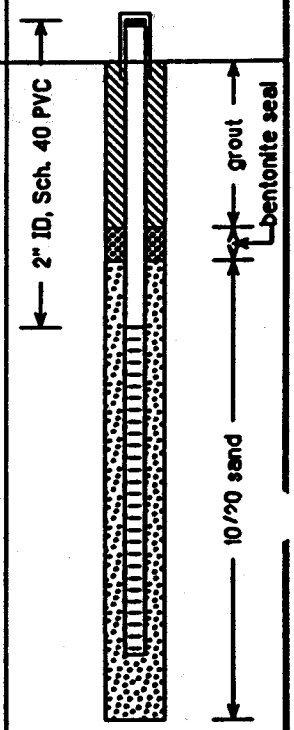
Log of Monitoring Well 08MW01S

(008G01LS)

Project: NAS Memphis	Location: Millington, TN. SWMU#8 - Cemetery Disposal Area
Project No.: N0094	Surface Elevation: feet msl
Started at on 2-10-95	TOC Elevation: feet msl
Completed at on 2-10-95	Depth to Groundwater: feet Measured:
Drilling Method: Rotasonic	Groundwater Elevation: feet msl
Drilling Company: North Star Drilling	Total Depth: 18.0 (below grade) feet
Geologist: William Parks	Well Screen: 8 to 18 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
5	X		1	50	BG		ML	Silt, yellowish brown, mottled yellowish gray; contains small iron- manganese nodules, moist from 12'-15'.	
10	X		2	110	BG				
15	X		3	70	BG			Silt, moderate yellowish brown; contains some gravels from 19'-20'.	
20	X		4	140	BG		GM	End of boring at 20'. Monitoring well closed in place on 3/07/95 due to the absence of groundwater. Well was closed by drilling out the well and grouting up the remaining borehole.	
25									
30									
35									
40									

WELL DIAGRAM



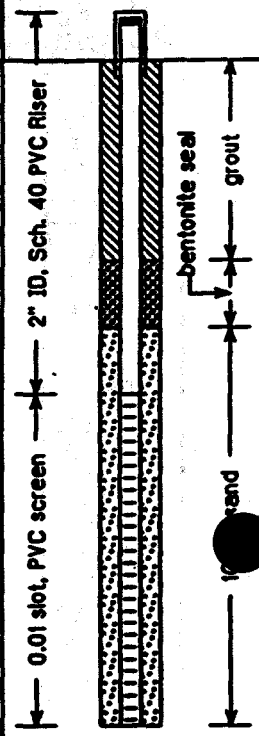
EnSafe/Allen & Hoshall

Log of Monitoring Well 08MW02S
(008G02LS)

Project: NAS Memphis	Location: Millington, TN SWMU#8-Cemetery Disposal Area
Project No.: N0094	Surface Elevation: feet msl
Started at on 2-01-95	TOC Elevation: feet msl
Completed at on 2-01-95	Depth to Groundwater: feet Measured:
Drilling Method: Rotasonic	Groundwater Elevation: feet msl
Drilling Company: North Star Drilling	Total Depth: 20.0 feet
Geologist: William Parks and Jack Carmichael	Well Screen: 10 to 20 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, yellowish brown streaked w/ yellowish gray, moist at 14'.	
5			1	75	BG				
10							ML		
			2	100	BG				
15			3	100	BG			Silt, yellowish brown to moderate brown. (17'-22')	
20			4	100	BG			End of boring at 20'.	
25									
30									
35									
40									

WELL DIAGRAM



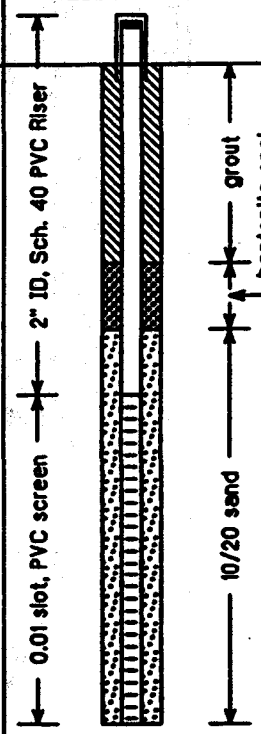
EnSafe/Allen & Hoshall

Log of Monitoring Well 08MW03S
(008G03LS)

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#8 – Cemetery Disposal Area*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *on 2-01-95*	TOC Elevation: *feet msl*
Completed at *on 2-01-95*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *William Parks and Jack Carmichael*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X		1	100	BG			Silt, yellowish brown streaked w/ yellowish gray. Moist at 12'.	
	X		2	125	BG				
5	X								
	X		3	62.5	BG				
10	X						ML		
	X		4	100	BG				
15	X								
	X		5	100	BG			Silt, yellowish brown to moderate brown. (16'-22')	
20	X		6	100	BG			End of boring at 20'.	
25									
30									
35									
40									

WELL DIAGRAM



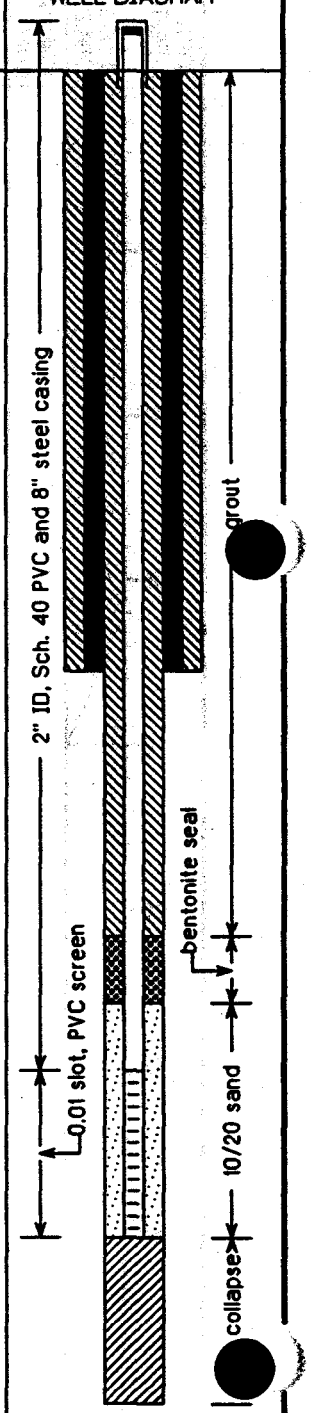
EnSafe/Allen & Hoshall

Monitoring Well 08MW01F

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#8–Cemetery Disposal Area*
Project No.: *N0094*	Surface Elevation: *322.14 feet msl*
Started at *1415 on 1-31-95*	TOC Elevation: *324.828 feet msl*
Completed at *1515 on 1-31-95*	Depth to Groundwater: *21.61 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *303.22 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50.0 feet*
Geologist: *William Parks and Jack Carmichael*	Well Screen: *30 to 35 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, yellowish brown, mottled yellowish gray; contains small iron- manganese nodules, moist from 12'-15'.	
5			1	50	BG				
10			2	110	BG		ML		
15			3	70	BG			Silt, moderate yellowish brown; contains some gravels from 19'-20'.	
20			4	140	BG			Sand, silty with gravel; moderate reddish brown to dark yellowish orange, wet.	302.1
25			5	22	BG				
30			6	150	BG		GM	Same as above with gravels increasing in size and slightly less silt and clay.	
35			7	100	BG				
40			8	110	BG				

WELL DIAGRAM



EnSafe/Allen & Hoshall

Monitoring Well 08MW01F

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#8-Cemetery Disposal Area*
Project No.: *N0094*	Surface Elevation: *322.14 feet msl*
Started at *1415 on 1-31-95*	TOC Elevation: *324.828 feet msl*
Completed at *1515 on 1-31-95*	Depth to Groundwater: *21.61 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *303.22 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *50.0 feet*
Geologist: *William Parks and Jack Carmichael*	Well Screen: *30 to 35 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							GM		281.1	
							CL	Clay, silty, soft, mottled very pale orange to pale yellowish orange.	278.1	
45							GM	Sand, laminated, mottled very pale orange to medium reddish orange. At 48.5', change to dusky yellowish orange fine sand with silt.		Hole collapse
50			9	100	BG			End of boring at 50'.	272.1	
55								BG = Background (1.1 ppm)		
60										
65										
70										
75										
80										

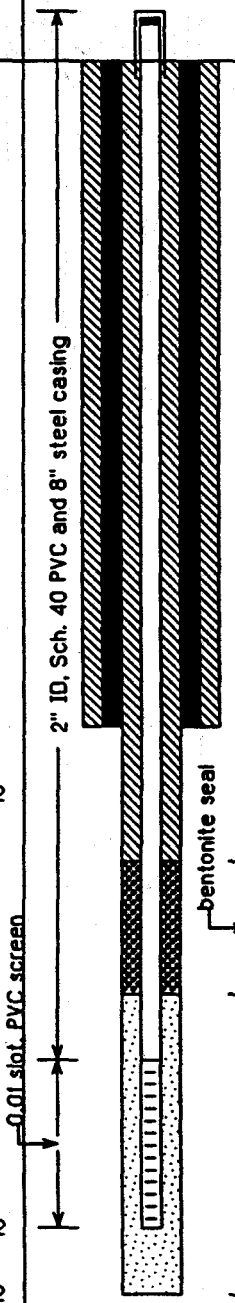
EnSafe/Allen & Hoshall

Monitoring Well 08MW02F

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#8-Cemetery Disposal Area*
Project No.: *N0094*	Surface Elevation: *325.21 feet msl*
Started at *0845 on 2-01-95*	TOC Elevation: *327.56 feet msl*
Completed at *0930 on 2-01-95*	Depth to Groundwater: *22.65 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *304.91 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *37.0 feet*
Geologist: *William Parks and Jack Carmichael*	Well Screen: *30 to 35 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	75	BG		ML	Silt, yellowish brown streaked w/ yellowish gray, moist at 14'.	
5									
10			2	100	BG				
15			3	100	BG			Silt, yellowish brown to moderate brown. (17'-22')	
20			4	100	BG				
									303.2
25			5	87.5	BG		GM	Sand, silty with gravel; reddish brown to reddish orange, fine to coarse grained, chert and quartz gravels. (22'-35')	
30			6	100	BG				
35									290.2
			7	110	BG		SP	Sand, fine, silty with clay and ferruginous nodules or chips, laminated yellowish gray, olive gray, and dark yellowish orange.	288.2
								End of boring at 37'.	
40								BG = Background (1.1 ppm)	

WELL DIAGRAM



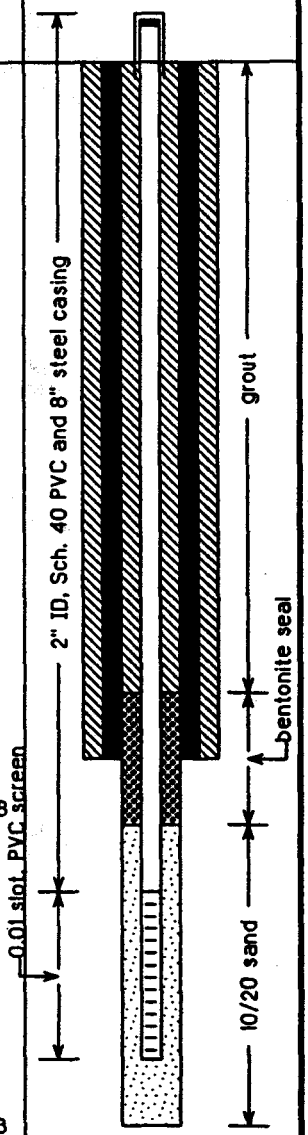
EnSafe/Allen & Hoshall

Monitoring Well 08MW03F

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#8 - Cemetery Disposal Area*
Project No.: *N0094*	Surface Elevation: *325.32 feet msl*
Started at *1015 on 2-01-95*	TOC Elevation: *327.46 feet msl*
Completed at *1120 on 2-01-95*	Depth to Groundwater: *22.89 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *304.57 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *32.0 feet*
Geologist: *William Parks and Jack Carmichael*	Well Screen: *25 to 30 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	BG		ML	Silt, yellowish brown streaked w/ yellowish gray. Moist at 12'.	
			2	125	BG				
5									
			3	62.5	BG				
10									
			4	100	BG				
15									
			5	100	BG			Silt, yellowish brown to moderate brown. (16'-22')	
20			6	100	BG				
									302.8
			7	100	BG		GM	Sand, silty with gravels at 24'; yellowish brown, very silty.	
25								Sand, fine to coarse, silty with clay, fine, gravel increasing towards the bottom, dark yellowish orange, wet. (25'-30')	
30			8	100	BG			Same as above except there is an increase in clay content with partial cementation. (30'-32')	
			9	100	BG				293.3
								End of boring at 32'.	
35									
								BG = Background (1.1 ppm)	
40									

WELL DIAGRAM



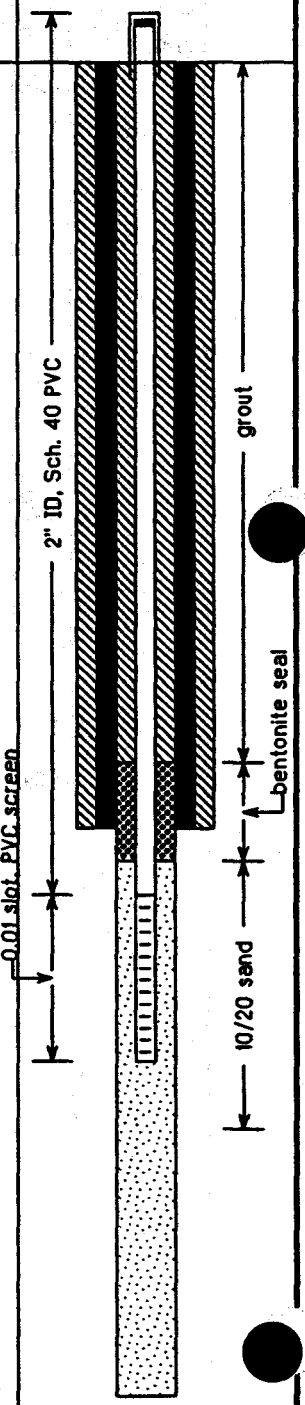
EnSafe/Allen & Hoshall

Monitoring Well 08MW04F

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#8 – Cemetery Disposal Area*
Project No.: *N0094*	Surface Elevation: *324.66 feet msl*
Started at *1315 on 2-01-95*	TOC Elevation: *327.37 feet msl*
Completed at *1430 on 2-01-95*	Depth to Groundwater: *22.65 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *304.72 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *40.0 feet*
Geologist: *William Parks and Jack Carmichael*	Well Screen: *25 to 30 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	BG			Silt, yellowish brown streaked w/ yellowish gray. Moist at 12'.	
			2	100	BG				
5			3	100	BG				
			4	100	BG				
10			5	125	BG		ML		
15			6	100	BG			Silt, yellowish brown to yellowish gray, mottled.	
20			7	100	4.5			Silt, moderate brown.	
			8	125	BG				
25							GM	Sand, moderate brown to reddish brown, very silty, contains scattered gravel.	299.7
			9	100	2.5			Sand and gravel, reddish brown to yellowish brown, chert and quartz gravels up to 3" in longest dimension. (27'–29.5')	
30			10	100	BG		ML	Silt, clayey, with iron stones (flat, not gravel), dark yellowish orange, moist. (29.5'–34')	295.2
35			11	100	BG		SP	Sand, very fine with silt and clay, mottled yellowish gray to dark yellowish orange, moist. (34'–40')	290.7
40			12	90	BG				284.7

WELL DIAGRAM



(008GM10LS)

LITHOLOGIC LOG FOR MONITOR WELL GM-10

Description	Depth (ft)	Thickness (ft)
Clay, pliable, medium pack, brown.....	0 - 10.0	10.0
Clay, pliable, loose pack, brown.....	10.0 - 20.0	10.0
Clay, pliable, loose pack, gravelly, brown.....	20.0 - 25.0	5.0
Sand, medium grain, clayey, gravelly, orange.....	25.0 - 30.0	5.0
Sand, medium grain, clayey, orange.....	30.0 - 33.0	3.0
Clay, firm, dense pack, orange-yellow.....	33.0 - 40.0	7.0
Clay, firm, dense pack, slightly gravelly, gray.....	40.0 - 43.0	3.0
Clay, sandy, fine-grain, dense pack, gray.	43.0 - 52.0	9.0
Clay, gravelly, medium pack, gray.....	52.0 - 53.0	1.0

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: Navy - Memphis DATE: 6-13-85 SHEET: 1 OF ___

LOCATION: Millington; cemetery side DRILLING CONTRACTOR: Amer. Drill.

WELL NUMBER: ~~GM-10~~ (boring) DRILLING METHOD: solid-stem auger

SAMPLE DESCRIBED BY: BSS/DG SAMPLING METHOD: sample ID lights

SAMPLE DESCRIPTION	Blow/ft	DEPTH INTERVAL (FEET)	THICKN (FEE
Clay, pliable, medium peak, brown		0 - 10	
SAME AS ABOVE, BUT LOOSE AND WET AT 15 FT.		10 - 15	
"		15-20	
" . BUT W/ LARGE GRAVEL. [WATER-BEARING FORMATION.]		20-25	
Sand, clayey, medium-grained, orange; gravel. Very wet		25-30	
Sand, medium-grained, clayey, orange.		30-33	
Clay, firm, dense peak, orange-yellow.		33 - 40'	
Clay, fine-grained, gravel, dense, light grey		40 - 43	
Clay, sandy, fine-sand, dense, dark grey		43- 45.	
Same as above		45 - 52	
Clay, gravelly, medium peak, grey		52 - 53	

GM-16

	Thing	Eched
TD	30'	
Screen	25-30	
Sand	22-30	
peaks	21-22	
grout	0-21	

(008GM11LS)

LITHOLOGIC LOG FOR MONITOR WELL GM-11

Description	Depth (ft)	Thickness (ft)
Clay, pliable, medium pack, brown.....	0 - 12.0	12.0
Clay, pliable, loose pack, brown.....	12.0 - 30.0	18.0

LITHOLOGIC LOG FOR MONITOR WELL GM-12

(008GM12LS)

Description	Depth (ft)	Thickness (ft)
Clay, pliable, medium pack, brown.....	0 - 17.0	17.0
Cl[illegible] pack, slightl[illegible] [illegible])	[illegible]	5.0
Clay, pliable, medium pack, very gravelly.	22.0 - 24.0	2.0
Clay, sandy, medium grain, gravelly, orange.....	24.0 - 28.0	4.0

GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: NAS - Memphis DATE: 6-14-85 SHEET: 1 OF

LOCATION: Millington, TN - cemetery site DRILLING CONTRACTOR: Anc. Drill. Co.

WELL NUMBER: GM-11 DRILLING METHOD: hollow-stem auger

SAMPLE DESCRIBED BY: BJS SAMPLING METHOD: sample all flights

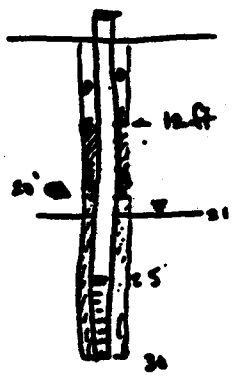
SAMPLE DESCRIPTION	BOW/H	DEPTH INTERVAL (FEET)	THICKN (FEE
Clay, pliable, medium peak, brown		0-~~7~~ 12	
SAME AS ABOVE, BUT LOOSE AND WET @ 10 FT		12-17	
" W.L @ 21.5 FT		17-22	
"		22-27.5	
"			
"		27.5-30'	

Theoretical

Screen 25'-30'
Sand 20'-28'
Bentonite 20'-19'
grout 19'-0'

Actual

Screen 25'-30
Sand 30'-12'
Bentonite 12'-11'
grout 11'-0'



GERAGHTY & MILLER, INC.

WELL LOG

PROJECT: NAS- Memphis DATE: 6-13-85 SHEET: 1 OF ____

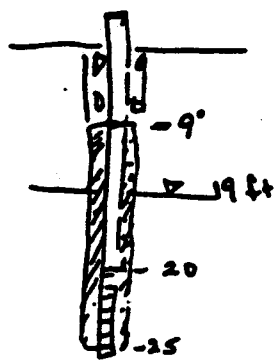
LOCATION: cemetery site DRILLING CONTRACTOR: Amer. Testing Co

WELL NUMBER: GM-12 DRILLING METHOD: solid stem auger

SAMPLE DESCRIBED BY: BJS/WDG SAMPLING METHOD: sample off flights

SAMPLE DESCRIPTION SHELBY TUBE	BOW/ft	DEPTH INTERVAL (FEET)	THICKN (FEE
Clay, pliable, medium packed, brown (Moist @ 7 ft)		0 - 7	
SAME AS ABOVE		7 - 12	
		12 - 17	
" ; gravel, very wet		17 - 22	
" ; lot of gravel, large stones.		22 - 24	
(Two shelby tubes; no recovery)			
~~Clay~~, Sandy, med. grained/clayey; gravel w/ sand at 19 ft.		24 - 28	
		T.D. = 28 ft	

Theoretical		Actual
Screen	—	25'-20
sand	—	25'-9'
bentonite	—	9'-7'
grout	—	grout 7'-0'



SWMU 9

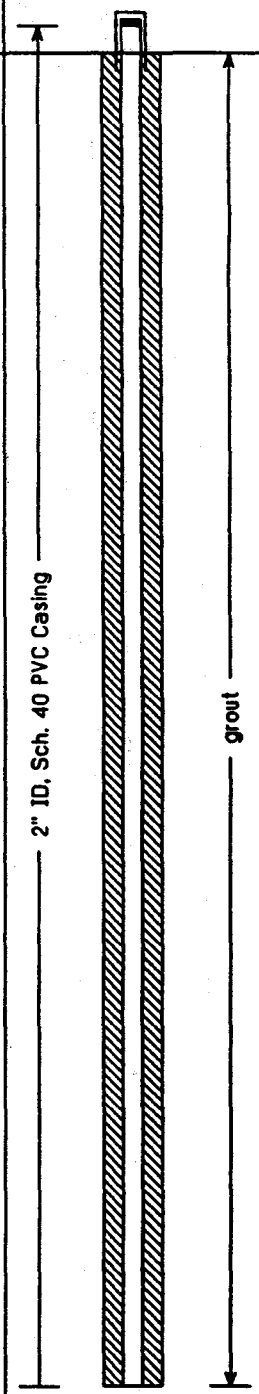
EnSafe/Allen & Hoshall

Monitoring Well 009G01DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #9 (Sewage Lagoons)*
Project No.: *0106-22111*	Surface Elevation: *269.69 feet msl*
Started at *1230 on 2-15-96*	TOC Elevation: *271.62 feet msl*
Completed at *1500 on 2-15-96*	Depth to Groundwater: *19.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *251.75 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *66 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *46 to 56 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG			(0-39') Upper Alluvium (see descriptions below).	
			1	50	BG		ML CL	(0-6') Silt and clay, brown to dark yellowish-brown in color with some organic material.	
5					BG				263.7
					BG			(6-39') Silt (see descriptions below).	
					BG			(6-16) Medium brown in color, with some iron, organic material and dark orangish-yellow staining, moist.	
10			2	40	BG				
					BG				
15					BG				
					BG			Shelby Tube sample collected from 16-18' for geotechnical analysis. (18-24') Mottled yellowish-brown and yellowish-gray in color with dark orangish-yellow to reddish-brown iron staining.	
					BG				
20			3	70	BG		ML		
					BG			(24-26') Light olive gray to greenish-gray in color. Wet.	
25					BG			(26-29') Greenish-gray in color.	
					BG				
					BG			(29-39') Sandy silt with common snail shells. Greenish-gray to olive gray in color between 29' and 34'.	
30			4	90	BG				
					BG			Brownish-gray in color between 34' and 39'. Some snail shells present.	
35					BG				
					BG				
					BG		SP	(39-56') Deeper Alluvium (see descriptions below).	230.7
40									

WELL DIAGRAM



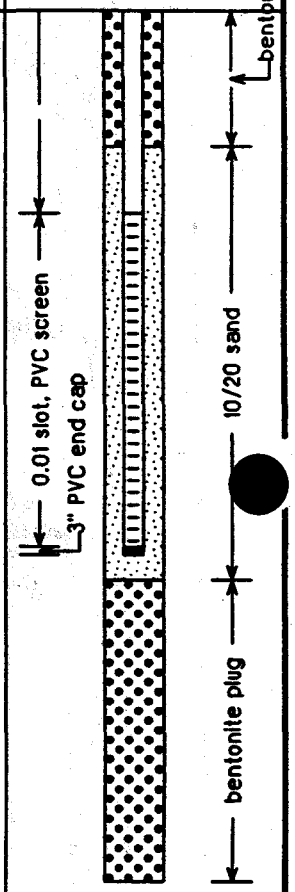
EnSafe/Allen & Hoshall

Monitoring Well 009G01DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #9 (Sewage Lagoons)*
Project No.: *0106-22111*	Surface Elevation: *269.69 feet msl*
Started at *1230 on 2-15-96*	TOC Elevation: *271.62 feet msl*
Completed at *1500 on 2-15-96*	Depth to Groundwater: *19.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *251.75 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *66 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *46 to 56 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	90	BG		SP	(39-42') Coarse-grained sand, light olive gray in color.	227.7
					BG		GW	(42-42.5') Gravel lense.	227.2
							SP	(42.5-43') Coarse-grained sand.	226.7
							ML		
45					BG			(43-45') Silt, very light gray to moderate gray in color.	224.7
					BG		SW	(45-48') Sand with some gravel, yellowish-gray in color.	221.7
					BG			(48-56') Sand and gravel. Gravel is up to 3" in longest dimension. Dusky yellow to yellowish-gray in color.	
50			6	70	BG		SW/GW		
					BG				
55					BG				213.7
					BG			Cockfield Formation: Fine-grained sand, light olive gray, finely lignitic and micaceous.	
					BG				
60			7	90	BG		SP		
					BG				
65					BG				203.7
								Terminated soil boring at 66'.	
70									
75									
80									

WELL DIAGRAM



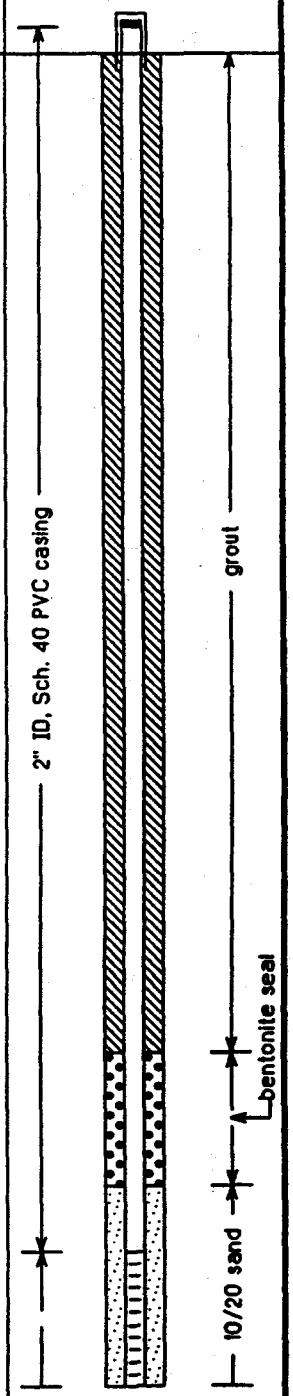
EnSafe/Allen & Hoshall

Monitoring Well 009G02DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #9 (Sewage Lagoons)*
Project No.: *0106-22111*	Surface Elevation: *268.85 feet msl*
Started at *0930 on 2-16-96*	TOC Elevation: *270.80 feet msl*
Completed at *1100 on 2-16-96*	Depth to Groundwater: *11.65 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *259.15 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG			(0-40') Upper Alluvium (see descriptions below).	
			1	83	BG			(0-4') Fill material. Silt, moderate brown in color with some iron-staining. Wood fragments that appear to be burnt.	
5					BG			(4-40') Silt (see descriptions below).	
					BG			(4-8') Light olive gray to light brown in color. Dry.	
					BG			Clayey silt. Moderate yellowish-brown to light gray in color, mottled with some dark orangish-yellow-colored material. Moist. Organic material present from 6' to 18'.	
10			2	80	BG				
					BG				
15					BG			Increased iron staining from 15' to 16'.	
					BG				
					BG			Silt, greenish-gray to olive gray in color from 18' to 28'. Wet, with snail shells throughout.	
20			3	70	BG		ML		
					BG				
25					BG				
					BG				
					BG			Color change to brownish-gray. Thin sand lenses, occasionally as thick as 6", are present from 28' to 40'.	
30			4	90	BG				
					BG				
35					BG				
					BG			Shelby Tube collected from 36-38'.	
					BG				
40							SP		228.9

WELL DIAGRAM



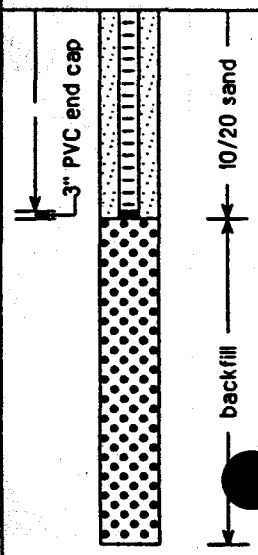
EnSafe/Allen & Hoshall

Monitoring Well 009G02DA

Project: *NSA Memphis*	Location: *Millington, TN. SHMU #9 (Sewage Lagoons)*
Project No.: *0106-22111*	Surface Elevation: *268.85 feet msl*
Started at *0930 on 2-16-96*	TOC Elevation: *270.80 feet msl*
Completed at *1100 on 2-16-96*	Depth to Groundwater: *11.65 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *259.15 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	100	BG			(40-46.5') Deeper Alluvium (see descriptions below).	228.0
					BG		SP	(40-46') Coarse-grained sand, yellowish-gray to dusky yellow. Some gravel (< 1" in longest dimension) is present from 45' to 46.5.	
45					BG				
					BG		SM	(46-46.5') Silt and sand, olive-gray in color.	222.9 222.4
					BG		CL	Cockfield Formation: Clay, dark brown in color, hard. Fine-grained sand streaks are present from 46.5' to 56'.	
50			6	110	BG				
					BG		SC	The percentage of sand incresases to greater than 50 percent from 52' to 56'.	216.9
55					BG				212.9
								Soil boring terminated at 56'.	
60									
65									
70									
75									
80									

WELL DIAGRAM



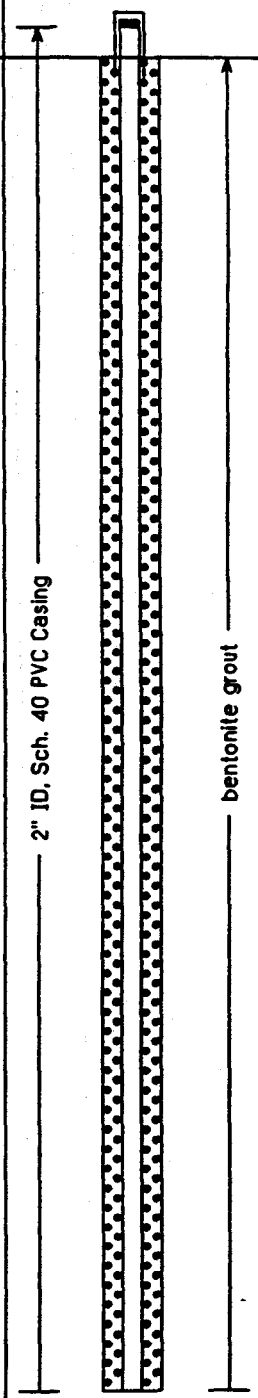
EnSafe/Allen & Hoshall

Monitoring Well 009G03DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #9 (Sewage Lagoons)*
Project No.: *0106-08420*	Surface Elevation: *267.18 feet msl*
Started at *1300 on 1-31-96*	TOC Elevation: *269.05 feet msl*
Completed at *1200 on 2-1-96*	Depth to Groundwater: *15.79 feet* Measured: *4/8/96*
Drilling Method: *Hollow-Stem Auger/3" diameter split spoon*	Groundwater Elevation: *253.26 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *62 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1	75	BG			(0-34') Upper Alluvium (see descriptions below).	
			2	92	BG		ML	(0-2') Clayey silt. Light brown to light yellowish-brown and brownish- orange in color.	
5			3	67	BG			(2-4') Silt, light brown in color. Some debris with burnt wood are also present. Appears to be fill.	263.2
			4	83	BG		ML CL	(4-6') Silt and clay, light gray to moderate gray color with black plant debris. Organic odor.	
		◢	5	96	BG			From 6' to 10', silt and clay is light gray to greenish-gray in color with moderate brown specks of material. Slightly moist from 6' to 8', and moist from 8' to 10'.	
10			6	79	BG				257.2
			7	71	BG		ML	(10-14') Silt, greenish-gray to light gray/brown color. Moist.	
		◢	8	92	BG			(14-34') Silt and clay, greenish-gray in color. Moist. Prevalent iron staining from 16' to 20'.	253.2
15			9	71	BG				
			10	100	BG			Abundant organic debris from 18' to 19'.	
20			11	71	BG			Greenish-gray to olive gray in color from 20' to 22'.	
			12	83	BG		ML CL	Light olive gray to light greenish-gray from 22' to 34'. Moist. Some organic specks of material present.	
25			13	67	BG				
			14	83	BG				
			15	100	BG				
30			16	92	BG				
			17	100	BG			With minor amount of sand near 34'.	
35			18	83	BG		SW	Contact with Deeper Alluvium deposits estimated at 34'.	233.2

WELL DIAGRAM



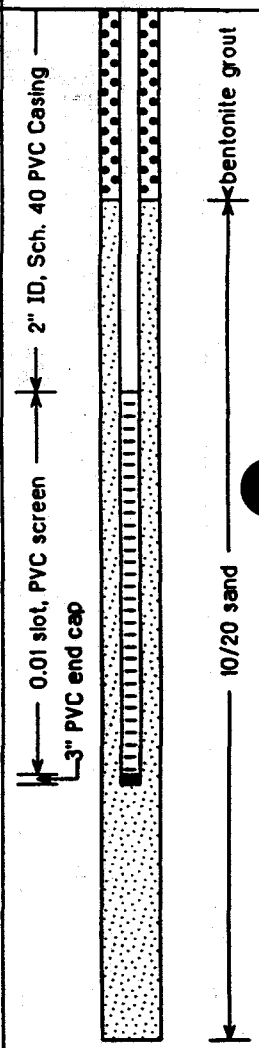
EnSafe/Allen & Hoshall

Monitoring Well 009G03DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #9 (Sewage Lagoons)*
Project No.: *0106-08420*	Surface Elevation: *267.18 feet msl*
Started at *1300 on 1-31-96*	TOC Elevation: *269.05 feet msl*
Completed at *1200 on 2-1-96*	Depth to Groundwater: *15.79 feet* Measured: *4/8/96*
Drilling Method: *Hollow-Stem Auger/3" diameter split spoon*	Groundwater Elevation: *253.26 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *62 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *45 to 55 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SW	(34-37') Sand, fine to coarse-grained, medium olive gray in color. Some silt lenses present.	
			19	100	BG				230.2
							ML	(37-38') Silt, light olive gray.	229.2
			20	100	BG		SW	(38-39.5') Sand.	
									227.7
40							ML	(39.5-40') Silt.	227.2
			21	100	BG		SW	(40-42') Sand, fine to coarse-grained, light olive gray in color at 40' changing to yellowish brown/gray near 42'.	
			22	100	BG		SW/GW		225.2
									224.2
			23	92	BG		SP	(42-43') Sand and gravel, light olive gray to yellowish-gray.	
45									222.2
			24	100	BG			(43-45') Coarse-grained sand, yellowish-gray.	
							SC/GC	(45-49') Sand and gravel in a clay matrix. Yellow gravel, light gray clay.	
			25	100	BG			Sand and gravel with some clay, light olive gray to yellowish-gray in color.	218.2
50			26	100	BG		SW/GW	(49-53') Sand and gravel. Yellowish-brown to reddish-brown.	
			27	100	BG				
									214.2
			28	0	BG			No sample recovery from 53' to 60'.	
55									
60									207.2
			29	100	BG		SP	Cockfield Formation: very fine-grained sand, light gray in color, finely lignitic.	206.2
							ML/CL	Silt and clay, light brown to light gray.	205.2
								Terminated soil boring at 62'.	
65									
70									

WELL DIAGRAM



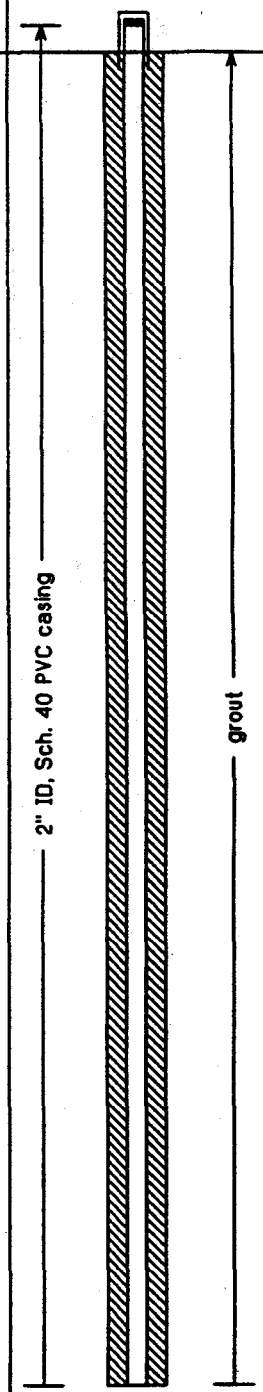
EnSafe/Allen & Hoshall

Monitoring Well 009G04DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #9 (Sewage Lagoons)*
Project No.: *0106-08420*	Surface Elevation: *268.15 feet msl*
Started at *0745 on 2-15-96*	TOC Elevation: *270.09 feet msl*
Completed at *1000 on 2-15-96*	Depth to Groundwater: *19.89 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *250.20 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG			(0-41') Upper Alluvium (see descriptions below).	
					BG		ML	(0-6') Clayey silt, brown in color. Appears to be fill material used during levee construction.	
5					BG				
			1	50					262.1
					BG			Slightly silty clay, brownish-gray in color. Very stiff.	
					BG				
10			2	85	BG		CL	Increasing silt fraction. Mottling with olive gray-colored silt. Dark greenish-yellow staining is present with iron/organic specks.	
					BG				
15					BG				252.1
					BG			(16-42') Silt (see descriptions below).	
					BG			(16-22') Yellowish-brown to yellowish-gray in color with dark orangish-yellow staining. Moist to wet.	
20			3	100	BG				
					BG			(22-26') Color change to predominantly gray. Wet.	
25					BG				
					BG			(26-34') Olive gray to greenish-gray in color, with common snail shells. Wet.	
					BG		ML		
30			4	120	BG				
					BG				
35					BG			Increasing clay fraction from 34' to 36'. Brownish-gray in color.	
					BG			(36-38') Brownish-gray in color, dry.	
40					BG			(38-42') Contains some scattered gravel and a few sand lenses. Contact with Deeper Alluvium deposits (41-72') estimated at 41'.	

WELL DIAGRAM



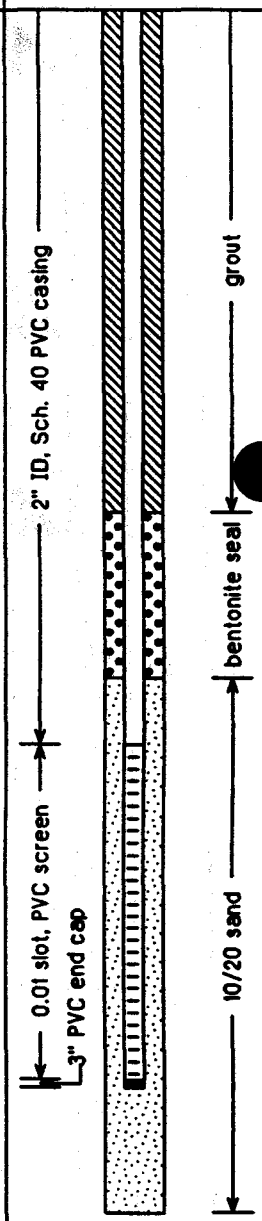
EnSafe/Allen & Hoshall

Monitoring Well 009G04DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU-#9 (Sewage Lagoons)*
Project No.: *0106-08420*	Surface Elevation: *268.15 feet msl*
Started at *0745 on 2-15-96*	TOC Elevation: *270.09 feet msl*
Completed at *1000 on 2-15-96*	Depth to Groundwater: *19.89 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *250.20 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *76 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *62 to 72 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	60	BG		ML		
					BG		SW GW	(42-55') Sand and gravel; gravel is up to 2" in longest dimension. Yellowish-gray to light olive gray in color.	226.1
45					BG				
					BG			Minor clay fraction in sand and gravel from 46' to 52'. Yellowish- gray to very light gray in color.	
					BG				
50			6	90	BG				
					BG			Sand and gravel, yellowish-gray to light yellowish-brown from 52' to 56'.	
55					BG		SM GC	Sand and gravel with intersitial silt and clay. Dark orangish-yellow to reddish-brown from 55' to 56'.	213.1 / 212.1
					BG		SW GW	Sand and gravel with minor clay, gravel is up to 3" in longest dimension, dark yellowish-brown to reddish-brown from 56' to 72'.	
60					BG				
			7	90	BG				
65					BG				
					BG				
70			8	80	BG				
					BG		SP	Cockfield Formation: Fine to medium-grained sand, very light gray to very light olive gray, micaceous and finely lignitic.	196.1
75					BG				192.1
								Soil boring terminated at 76'.	
80									

WELL DIAGRAM



SWMU 14

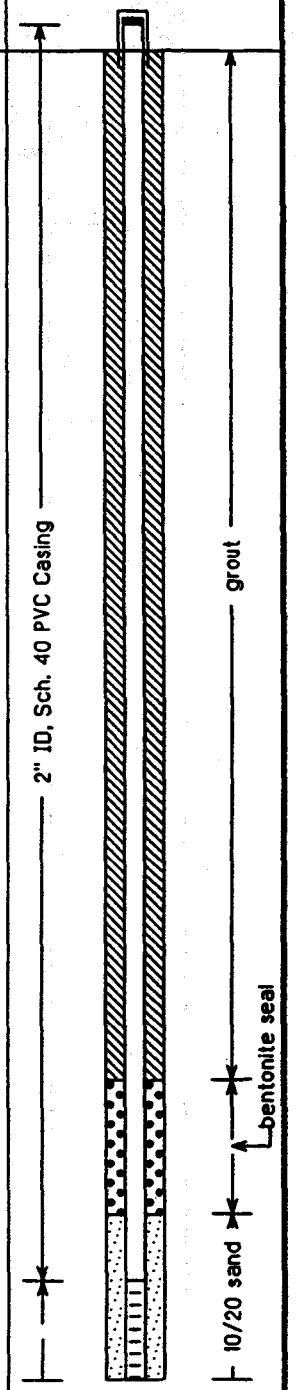
EnSafe/Allen & Hoshall

Monitoring Well 014G01LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *267.24 feet msl*
Started at *1320 on 1-29-96*	TOC Elevation: *269.11 feet msl*
Completed at *1530 on 1-29-96*	Depth to Groundwater: *7.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *261.65 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *51 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		OL GW	(0-1') Soil and gravel.	266.2
					BG		ML	(1-3.5') Silt and clay (see descriptions below).	
			1	100				(1-2') Clayey silt. Dark yellowish-brown to dusky yellowish-brown in color.	263.7
5					5		CL	(2-3.5') Silty clay. Dark yellowish-brown to dusky yellowish-brown in color.	
					4			(3.5-7') Clay, silty, pale yellowish-brown, mottled with light olive gray-colored material.	260.2
			2	83	3			No description available; collected a Shelby tube sample from 7' to 10' for geotechnical analysis.	257.2
10					BG			(10-16') Clay and silt (see descriptions below).	
			3	155	BG 4		CL	(10-15.5') Clay, silty, moderate yellowish-brown in color, mottled with light olive gray-colored silt. Iron-staining and iron-manganese nodules present near 15'.	
15					BG				
					BG			(15.5-16') Clayey silt, moderate yellowish-brown in color mottled with light olive gray to greenish-gray. Iron-manganese nodules and iron staining present.	251.2
					BG				
20			4	97	BG BG		ML	(16-26) Clayey silt, greenish-gray mottled with moderate yellowish-brown material near 16'. Iron staining increases with depth.	
					BG				
25					BG			Iron-manganese nodules present near 26'.	
					BG				240.2
					BG		ML	(27-32') Silt, clayey, moderate yellowish-brown in color, mottled with light olive gray to very light gray-colored material, with some hard siliceous clayey material, contains a large siliceous clay concretion at 27'.	
30			5	135	BG				
					BG		ML	(32-35') Clayey silt, moderate yellowish-brown mottled slightly with light olive gray to very light gray-colored material.	235.2
35					BG			(35-47') Fluvial Deposits (see descriptions below).	232.2
					BG		ML SC	(35-40') Silt, clay, and sand, with some scattered gravel, dusky yellow color mottled with light olive gray to very light gray material, moist.	
			6	113	BG				
40									227.2

WELL DIAGRAM



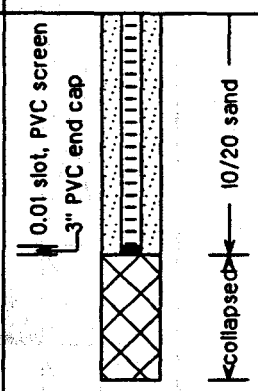
EnSafe/Allen & Hoshall

Monitoring Well 014G01LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *267.24 feet msl*
Started at *1320 on 1-29-96*	TOC Elevation: *269.11 feet msl*
Completed at *1530 on 1-29-96*	Depth to Groundwater: *7.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *261.65 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *51 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *37 to 47 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									227.2
			7	93				No description available; collected a Shelby tube sample from 40' to 43' for geotechnical analysis.	
			8	125	BG		SM GW	(43-43.5') Silt, sand, and gravel (up to 1" in longesty dimension), very light gray, wet.	224.2 / 223.7
45					BG		SW GW	(43.5-47') Sand and gravel. Sand is fine to very coarse-grained, and gravel (up to 1.5" in longest dimension) from 44' to 45'. Moderate yellowish-brown to light gray, wet. Longest dimension of gravel increases to up to 3.5" at 47'.	220.2
					BG				
			9	142	BG		SP CL		
50					BG				
					BG			(47-51') Cockfield Formation: Very fine-grained sand, silt, and clay. Dusky yellowish-brown mottled with light olive gray near 47'.	216.2
								Soil boring terminated at 51'.	
55									
60									
65									
70									
75									
80									

WELL DIAGRAM



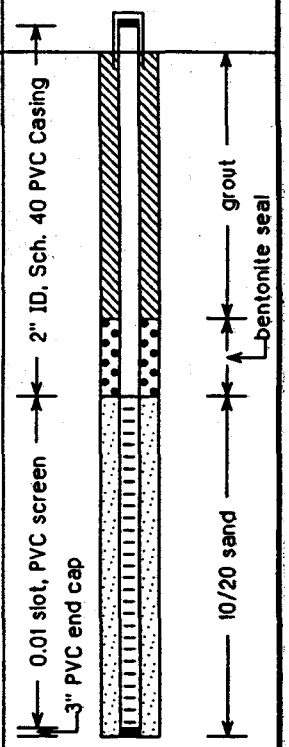
EnSafe/Allen & Hoshall

Monitoring Well 014G01LS

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *267.37 feet msl*
Started at *1030 on 1-29-96*	TOC Elevation: *269.17 feet msl*
Completed at *1245 on 1-29-96*	Depth to Groundwater: *6.79 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *262.38 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.59 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *10.34 to 20.34 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		■	1				OL GW	(0-1') Soil and gravel.	266.4
							ML	(1-3.5') Silt and clay (see descriptions below).	
								(1-2') Clayey silt. Dark yellowish-brown to dusky yellowish-brown in in color.	263.9
5		■	2				CL	(2-3.5') Silty clay. Dark yellowish-brown to dusky yellowish-brown in in color.	
								(3.5-7') Clay, silty, pale yellowish-brown, mottled with light olive gray-colored material.	260.4
		■	3					Collected Shelby Tube from 7' to 10'. No sample for description.	257.4
10								(10-16') Clay and silt (see descriptions below).	
							CL	(10-15.5') Clay, silty, moderate yellowish-brown in color, mottled with light olive gray-colored silt. Iron-staining and iron-manganese nodules present near 15'.	
15									251.4
							ML	(15.5-16') Clayey silt, moderate yellowish-brown in color mottled with light olive gray to greenish-gray. Iron-manganese nodules and iron staining present.	
20								(16-20.5') Clayey silt, greenish-gray mottled with moderate yellowish-brown material near 16'. Iron staining increases with depth.	246.8
25								Soil boring terminated at approximately 20.5'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 014G01LF.	
30									
35									
40									

WELL DIAGRAM



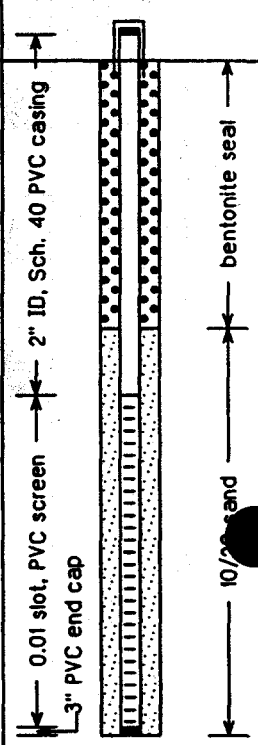
EnSafe/Allen & Hoshall

Monitoring Well 014G02LS

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.44 feet msl*
Started at *0850 on 2-14-96*	TOC Elevation: *270.12 feet msl*
Completed at *0915 on 2-14-96*	Depth to Groundwater: *7.61 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *262.51 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *A. Choate, C. Ivey*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML GC	(0-3') Gravel, silt, clay, and bricks from 0' to 3' (fill).	265.4
5			1	100	BG		CL	(3-6') Clay, brownish-gray in color	262.4
10							ML CL	Silt and clay, light olive gray to dark yellowish-brown in color from 6' to 9'. Silt and clay, yellowish-gray to yellowish-brown in color from 9' to 20'. Moist, with iron-staining and specks of organic material.	
15			2	120	BG				
20								Soil boring terminated at 20'. Note: This is a replacement well. The original well was installed a few feet away on 1/23/96 but was subsequently abandoned due to faulty construction. Analytical samples indicated on this boring log were collected from the soil boring associated with the original well.	248.4
25									
30									
35									
40									

WELL DIAGRAM



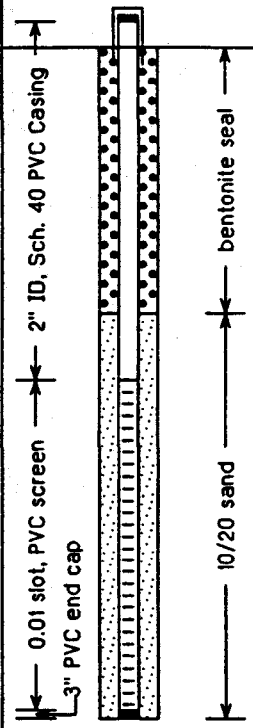
EnSafe/Allen & Hoshall

Monitoring Well 014G03LS

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.64 feet msl*
Started at *0745 on 2-14-96*	TOC Elevation: *271.09 feet msl*
Completed at *0815 on 2-14-96*	Depth to Groundwater: *8.39 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *262.70 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG			(0-8') Clay with some silt, dark brown to brownish-gray in color.	
					5		CL ML		
5			1	70	5				
					6				260.6
					6			(8-20') Silt, light yellowish-brown to yellowish-gray in color with dark orangish-yellow mottling and specks of organic material. Moist.	
10					6				
					5		ML		
15			2	90	5			Small concretion present at 15'.	
					5				
					5				
20									248.6
								Soil boring terminated at 20'.	
25									
30									
35									
40									

WELL DIAGRAM



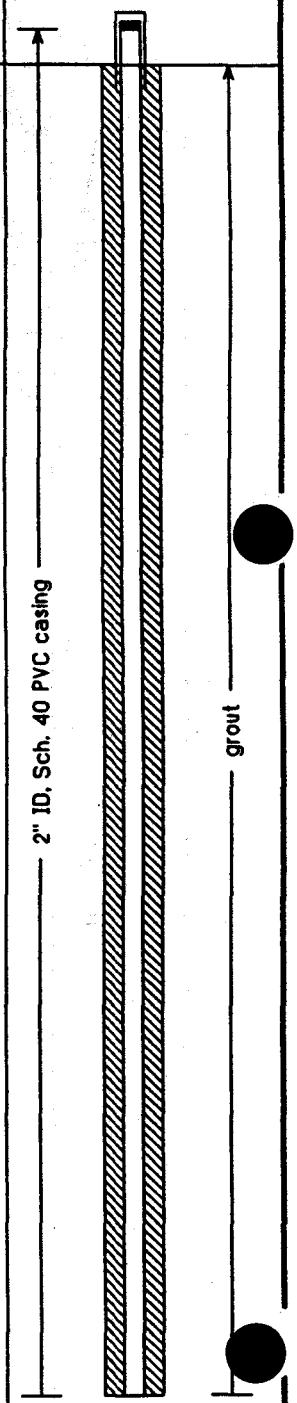
EnSafe/Allen & Hoshall

Monitoring Well 014G04LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.82 feet msl*
Started at *1330 on 1-23-96*	TOC Elevation: *270.88 feet msl*
Completed at *1530 on 1-23-96*	Depth to Groundwater: *8.79 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *262.09 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *39 to 49 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		OL GW	(0-2.5') Soil, gravel, brick, grass and roots (fill material).	
			1	46	BG		CL	(2.5-5') Silty clay. Dark yellowish-brown in color.	266.3
5					BG		ML	(5-20.5') Clayey silt. Moderate yellowish-brown to light olive gray in color. Mottled with light olive gray and olive gray-colored material. Iron-manganese nodules near 5'.	263.8
					BG			Moist near 7.5'.	
					BG				
10			2	107	BG			(10-12') Very moist.	
					8			Iron-manganese nodules near 11'.	
					8				
15					6				
					6				
					6				
20			3	121	6		ML	(20.5-23') Clayey silt is light olive gray in color with considerable dark yellowish-orange to moderate yellowish-brown colored iron staining. Some iron/manganese nodules are present	248.3
					6.5		CL	(23-30') Silty clay, greenish-gray in color with some dark yellowish- orange to moderate yellowish-brown iron-staining near 23'. Iron-staining and mottled light olive brown in color near 30'.	245.8
25					6.5				
					6.5				
					5			Fluvial Deposits (30-50') contact estimated at 30'.	
30							SP		238.8

WELL DIAGRAM



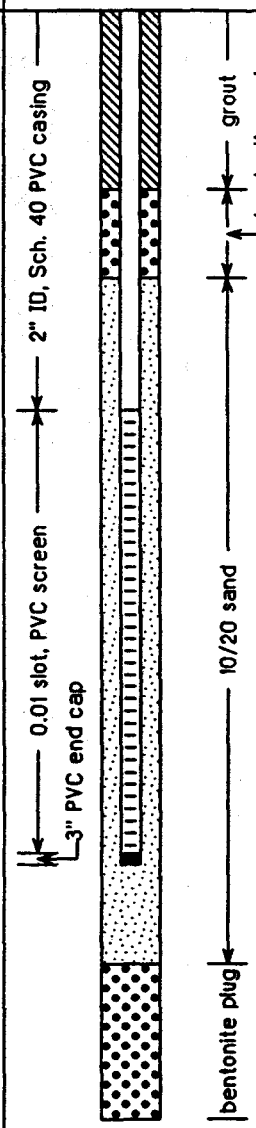
EnSafe/Allen & Hoshall

Monitoring Well 014G04LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.82 feet msl*
Started at *1330 on 1-23-96*	TOC Elevation: *270.88 feet msl*
Completed at *1530 on 1-23-96*	Depth to Groundwater: *8.79 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *262.09 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *39 to 49 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									238.8
			4	127	5		SP	(30-32') Sand, very fine-grained, moderate yellowish-brown in color mottled light gray-colored material.	236.8
					5		SM SC	(32-35') Sand (very fine to coarse-grained), silt, and clay. Moderate yellowish-brown in color mottled with light gray material. Moist near 34'. Becomes mostly very fine-grained sand and silt near 35'.	233.8
35					5		ML CL	(35-37') Silt and clay, greenish-gray in color mottled with moderate yellowish-brown material.	231.8
					4.5		SM SC	(37-38') Sand, silt, and clay. Olive gray to light brownish-gray in color.	230.8
					5.5		SC GM	(38-39') Silty and clayey sand and gravel. Light olive gray to moderate yellowish-brown in color. Wet.	229.8
40			5	113	5		GW GC	(39-42.5') Gravel, sand, and clay. Light olive gray in color, mottled with moderate yellowish-brown and dark yellowish-orange-colored material. Very cohesive and moist.	226.3
					5		SW GW	(42.5-46.5') Sand (medium to coarse-grained) and gravel (up to 1" in longest dimension. Light gray in color mottled with moderate yellowish-brown material. Wet.	
45					5				
			6	95	4		GW	(46.5-48') Sand is medium to very coarse-grained. Moderate yellowish-brown to dark yellowish-orange, wet.	220.8
					5				
50					5		SP SM	(48-49.5') Gravel (up to 4" in longest dimension) with sand. Moderate yellowish-brown in color. Wet.	218.8
			7	163	4.5			(50-55') Cockfield Formation (see description below).	
55					5			Very fine-grained silty sand, moderate yellowish-brown to dusky yellowish brown with light olive gray laminations.	213.8
60								Soil boring terminated at 55'.	

WELL DIAGRAM



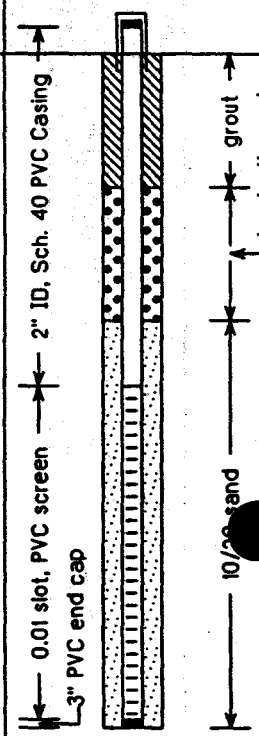
EnSafe/Allen & Hoshall

Monitoring Well 014G05LS

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.24 feet msl*
Started at *1445 on 1-21-96*	TOC Elevation: *270.12 feet msl*
Completed at *1605 on 1-21-96*	Depth to Groundwater: *9.84 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *260.28 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *A. Choate, C. Ivey*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-1.5') Soil and grass.	268.7
			1	108	BG			(1.5-20') Silt and clay (see descriptions below). (1.5-6') Silt and clay, dark yellowish-brown in color, becoming dark yellowish-brown to pale yellowish-brown in color near 6'. Dry.	
5									
								Clayey silt, dark yellowish-brown to dark yellowish-orange in color mottled with medium light gray-colored material. Slightly moist. Contains iron-manganese nodules.	
10			2	118	BG		ML CL		
15								Wet from 15' to 16'. The percentage of iron-manganese nodules increases near 16'.	
			3	142	BG			(16-20') Very clayey silt, light olive gray in color mottled with dark yellowish-brown to dark yellowish-orange material. The percentage of mottled material decreases with depth. Very moist. Contains iron-manganese nodules.	
20									248.2
								Terminated soil boring at 20'.	
25									
30									
35									
40									

WELL DIAGRAM



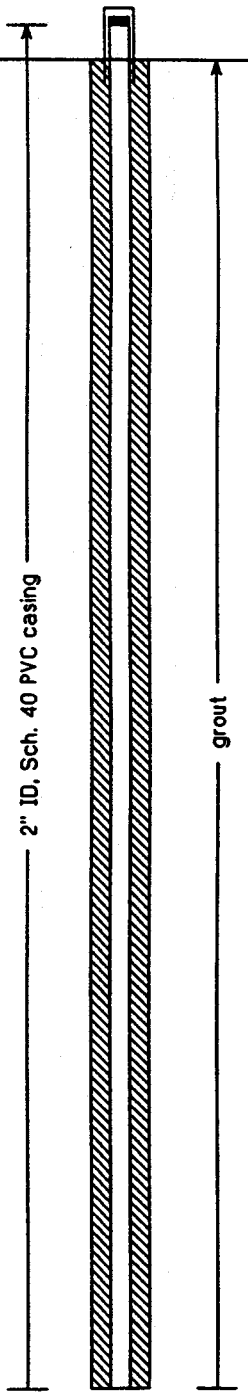
EnSafe/Allen & Hoshall

Monitoring Well 014G06LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.62 feet msl*
Started at *1450 on 1-20-96*	TOC Elevation: *270.57 feet msl*
Completed at *0850 on 1-21-96*	Depth to Groundwater: *10.32 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *260.25 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *A. Choate, C. Ivey*	Well Screen: *39 to 49 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		OL	(0-2') Soil, roots, and brick fragments. Soil is dark yellowish-brown to moderate yellowish-brown.	266.6
			1	72	BG			(2-17') Clayey silt and silty clay (see descriptions below).	
5					BG			(2-6.5') Very clayey silt. Moderate yellowish-brown to dark yellowish- brown in color. Color becomes lighter near 6.5'.	
					BG			(6.5-17') Silty clay. Moderate yellowish-brown in color mottled with yellowish-gray-colored material. Contains iron-manganese nodules. Slightly moist, becoming more moist, oxidized, and stained dark yellowish-orange near 11'.	
					BG		ML CL		
10									
			2	89	BG				
					BG				
15					BG				
					BG				251.6
					BG			(17-37') Silt, clayey (see descriptions below). (17-26') Clayey silt. Light olive gray to greenish-gray in color. Slightly moist. Becoming stiff near 26'.	
20									
			3	95	BG				
					BG		ML		
25					BG				
					BG			(26-32') Clayey silt, moderate yellowish-brown in color mottled with light olive-gray material. The percentage of light olive gray material progressively decreases from 26' to 32'. Iron concretions are present near 26'. Slightly moist at 26' becoming more moist near 32'.	
					BG				
30									

WELL DIAGRAM



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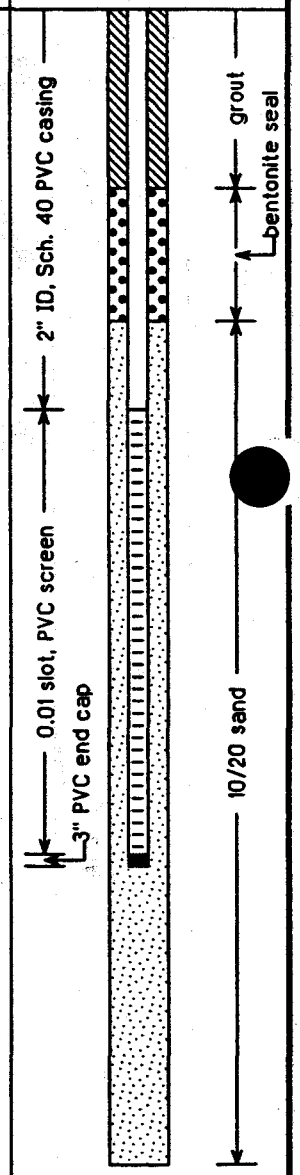
Monitoring Well 014G06LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.62 feet msl*
Started at *1450 on 1-20-96*	TOC Elevation: *270.57 feet msl*
Completed at *0850 on 1-21-96*	Depth to Groundwater: *10.32 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *260.25 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *A. Choate, C. Ivey*	Well Screen: *39 to 49 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			4	113	BG				
					BG		ML	(32-36') Silt, clayey, moderate yellowish-brown in color and slightly moist.	
35					BG				
					BG			(36-37') Clayey silt, moderate yellowish-brown in color mottled with light olive gray material, slightly moist.	231.6
					BG			(37-49') Fluvial Deposits (see descriptions below). (37-49') Sand and gravel (see descriptions below).	
40			5	97	BG			(37-38') Fine-grained sand and silt with gravel (up to 2" in longest dimension). Moderate yellowish-brown.	
					BG		SM GW	(38-42') Sand, fine, and gravel (up to 2" in longest dimension), silty, moderate brown mottled with pale yellowish-brown material.	
45					BG			(42-45') Sand (fine to coarse-grained) and gravel (up to 2" in longest dimension). Moderate brown to dark yellowish-orange in color. Wet.	
					BG			(45-49') Sand, medium to coarse, and gravel (up to 2" in longest dimension), moderate yellowish-brown to dark yellowish-orange. Wet.	
					BG			(49-56') Cockfield Formation (see description below).	219.6
50			6	114	BG			Silty, very fine-grained sand with silty clay laminations. Sand is dusky yellowish brown in color; clay laminations are light gray in color.	
					BG		SM CL		
55					BG			Becoming waxy near 56'.	
								Soil boring terminated at 56'.	212.6
60									

WELL DIAGRAM



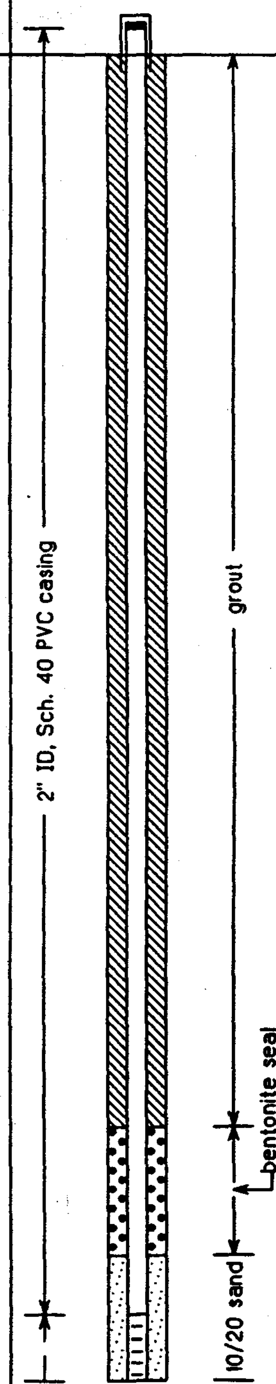
EnSafe/Allen & Hoshall

Monitoring Well 014G07LF

Project: *NSA Memphis*	Location: *Millington, TN, SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.88 feet msl*
Started at *1000 on 1-22-96*	TOC Elevation: *270.63 feet msl*
Completed at *1145 on 1-22-96*	Depth to Groundwater: *9.30 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – 4" inner core barrel/6" OD casing*	Groundwater Elevation: *261.33 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *50 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	SAMPLE NO.	% RECOVERY	PID (ppm)	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	1	50	BG BG BG	OL	(0-5') Soil, concrete, and rubble (fill). Note: Concrete was encountered at 2' below ground surface.	
5			BG BG BG	CL/ML	(5-22') Clay and silt (see descriptions below). (5-12') Silty clay. Dark yellowish-brown in color mottled with moderate yellowish-brown to dark yellowish-orange-colored material. Mottling increases in content progressively near 12'. Hard from 4' to 7'.	263.9
10	2		BG BG		Silt content increases near 11'. (12-16') Silty clay, olive gray to light olive gray in color mottled with moderate yellowish-brown to dark yellowish-orange-colored material. Contains iron-manganese nodules, increasing in percentage around 16'.	
15			BG BG BG		(16-22') Clayey silt. Moderate yellowish-brown in color mottled with light olive gray-colored material. Contains scattered iron- manganese nodules.	
20	3	139	BG		Dark yellowish-orange staining near 21'.	
			BG BG	ML	(22-32.5') Silt (see descriptions below). (22-25') Silt, medium dark gray to medium gray, mottled with some moderate yellowish-brown material near 22' where a few scattered iron-manganese nodules are located.	246.9
25			BG BG BG		(25-31.5') Silt, olive gray to greenish-gray in color, mottled with moderate yellowish-brown near 32.5'. Contains iron staining and iron-manganese nodules mostly near 29'.	
30	4	118	BG		(31.5-32.5') Silt, moderate yellowish-brown mottled with light gray.	
			BG BG	ML	(32.5-36') Clayey silt, moderate yellowish-brown in color. Mottled with light gray material near 34'.	236.4
35			BG BG	SM/GW	(36-48') Fluvial Deposits (see descriptions below). (36-43.5') Sand, silty, with gravel (see descriptions below). (36-37.5') Silty sand (very fine-grained) with gravel. Moderate yellowish-brown in color.	232.9
40						

WELL DIAGRAM



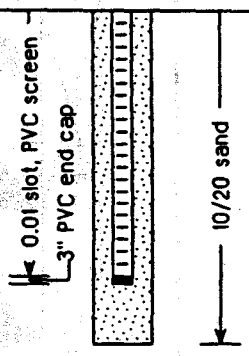
EnSafe/Allen & Hoshall

Monitoring Well 014G07LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.88 feet msl*
Started at *1000 on 1-22-96*	TOC Elevation: *270.63 feet msl*
Completed at *1145 on 1-22-96*	Depth to Groundwater: *9.30 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *261.33 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *50 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *38 to 48 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	107	BG		SM GW	Very silty sand (fine to coarse-grained) and gravel (up to 2" in longest dimension) subangular to rounded. Moderate yellowish-brown in color mottled with light olive gray and some dark yellowish- orange-colored material. From 37.5' to 41.5', sample is very difficult to split.	225.4
					BG				
45					BG		SW GW	(43.5-48') Sand and gravel, gravel and sand (see descriptions below).	
					BG				
			6	120	BG		SM	(43.5-46') Sand (medium to coarse-grained) and gravel (up to 2" in longest dimension). Dark yellowish-orange to moderate yellowish- brown in color. Wet.	220.9
50								(46-48') Gravel and sand, dark yellowish-orange to moderate yellowish- brown. Wet.	218.9
55								(48-50') Cockfield Formation (see description below).	
								Very fine-grained silty sand. Mottled with gray to light gray-colored very fine-grained sand, which decreases with depth. Becomes clayey near 50'.	
60								Soil boring terminated at 50'.	
65									
70									
75									
80									

WELL DIAGRAM



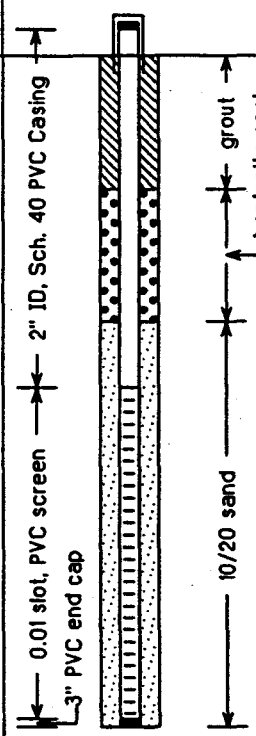
EnSafe/Allen & Hoshall

Monitoring Well 014G08LS

Project: *NSA Memphis*	Location: *Millington, TN, SWMU #14 (S-140/7th Ave. Ditch)*
Project No.: *0106-08420*	Surface Elevation: *268.52 feet msl*
Started at *1500 on 1-22-96*	TOC Elevation: *268.14 feet msl*
Completed at *1530 on 1-22-96*	Depth to Groundwater: *6.48 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *261.66 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	40	1 BG		OL	(0-5') Fill material: Soil, with bits of concrete and grass and roots.	
5					BG			(5-17') Clay and silt (see descriptions below).	263.5
					BG			(5-7') Silty clay. Moderate yellowish-brown to dark yellowish-orange in color and mottled with light olive gray-colored material. Slightly moist.	
					BG				
10			2	82	BG BG		CL ML	(7-16') Clayey silt. Moderate yellowish-brown to dark yellowish- orange in color mottled with light olive gray and some dark yellowish- orange material. Slightly moist.	
					BG				
15					BG			Moisture content increases near 16'. Sparse iron-manganese nodules are present near 16'.	252.5
			3	75	BG BG		ML	(16-17') Clayey silt moderate yellowish-brown to dark yellowish-orange in color and mottled with olive gray to light olive gray-colored material. Considerable iron staining. Contains iron-manganese nodules. Moist.	
20								(17-20') Silt, clayey, olive gray to light olive gray in color slightly mottled with dark yellowish-orange-colored material. Contains iron-manganese nodules, moist.	248.5
25								Terminated soil boring at 20'.	
30									
35									
40									

WELL DIAGRAM



SWMU 15

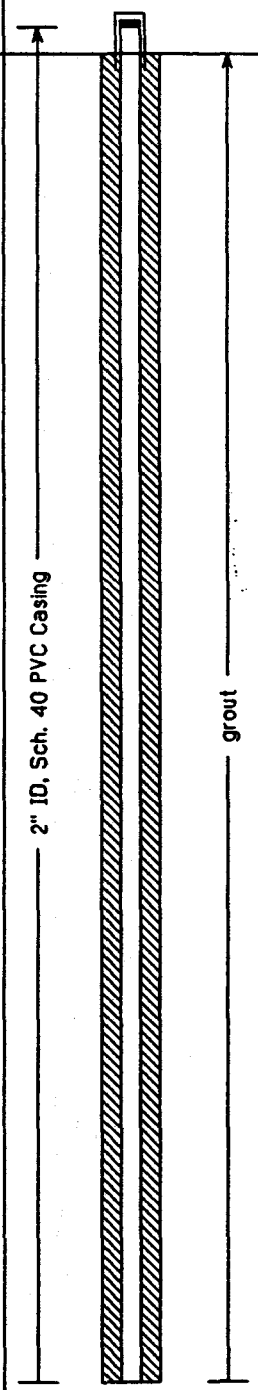
EnSafe/Allen & Hoshall

Monitoring Well 015G01LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *279.47 feet msl*
Started at *1225 on 3-13-96*	TOC Elevation: *281.90 feet msl*
Completed at *1545 on 3-13-96*	Depth to Groundwater: *26.55 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *255.35 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J. Kingsbury*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X		1	100	.5			(0'-2') Hand-augered. Silt, light brown to yellowish-brown in color.	
					1.7			(2'-15') Clayey silt, yellowish-brown to yellowish-gray in color mottled with dark yellowish-orange stained material.	
			2	75					
5					.5			(5'-10') Abundant organic material.	
					1.2				
					.7				
10									
			3	95	1.0				
					1.7		ML	(12'-16') Moist.	
15					2.2			Color change to olive gray/greenish-gray near 15'.	
					1.0			(16'-23') Silt, moist.	
					6.5				
20									
			4	95	15.4				
					182.7			Increasing clay fraction, less moist, color changes to brownish-gray at 23'.	
25					193.9				
									253.5
					40.2			(26'-32') Silt and clay, greenish-gray to brownish-gray in color. Iron-stained inclusions/nodules present.	
					24				
30							ML CL		
			5	120	12.6			(32'-35') Greenish-gray to light brown color.	
					17.7				
35					12.8				244.5
							SM	(35'-85') Fluvial Deposits.	243.5
					12.4		SW	(35'-36') Silty sand with some clay, fine to mdeium-grained, reddish-brown to dark yellowish-orange and gray in color.	
					17				
40									

WELL DIAGRAM



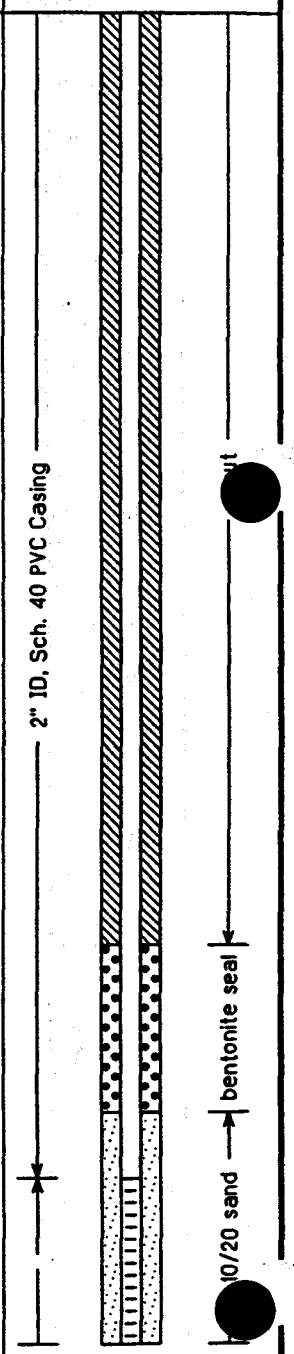
EnSafe/Allen & Hoshall

Monitoring Well 015G01LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *279.47 feet msl*
Started at *1225 on 3-13-96*	TOC Elevation: *281.90 feet msl*
Completed at *1545 on 3-13-96*	Depth to Groundwater: *26.55 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *255.35 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J. Kingsbury*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			6	110	18.4				
					37.1			(36'-38') Sand, fine to medium-grained, light brown to dark yellowish- orange color mottled with light gray-colored material. Color changes to dark yellowish-orange from 43' to 46'.	
45					59.4				
					48.3			(46'-53') Sand, medium to coarse-grained, with a trace of pea-size gravel dark yellowish-orange to pinkish-gray.	
					29.3				
50			7	100	8.6		SW		
					1.2			Color changes to very light gray/very light olive gray.	
55					1.0				
					1.0			Sand is fine to medium-grained and micaceous, very light gray to pinkish-gray.	
					0.5				
60									219.5
			8	110	0.5		SW/GW	(60'-62') Sand (fine to very coarse-grained) and gravel (up to 1" in longest dimemsion). Dusky yellow to yellowish-gray in color.	217.5
					0.5		SW	(62'-64') Sand lense present.	215.5
65					0.5		SW/GW	(64'-69') Sand, fine to very coarse-grained, and gravel (up to 1" in longest dimension). Becomes more dark yellowish-orange to dusky yellow color from 66' to 69'.	
					0.5		GW		212.5
								(67'-68') Gravel lens.	211.5
					0.5				
70			9	105	0.5			(68'-85') Sand, medium to very coarse-grained, and gravel, dusky yellow to yellowish-gray. (70'-76') Gravel fraction decreasing.	
					0.5		SW/GW		
75					0.5				
					0.5				
					0.5			(78'-85') Gravel fraction increasing, color changes to reddish- brown and dark yellowish-orange.	
80									

WELL DIAGRAM



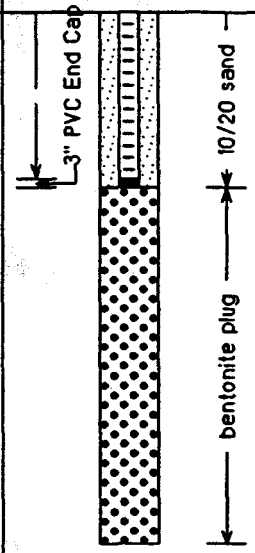
EnSafe/Allen & Hoshall

Monitoring Well 015G01LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *279.47 feet msl*
Started at *1225 on 3-13-96*	TOC Elevation: *281.90 feet msl*
Completed at *1545 on 3-13-96*	Depth to Groundwater: *26.55 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *255.35 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J. Kingsbury*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			10	100	0.5		SW GW		
					0.5				
85					0.5				194.5
					0.5		SP	(85'-96') Cockfield Formation: Sand, fine-grained, very light gray in color. Some clay streaks and yellowish-gray to light olive gray in color.	
					0.5				
90			11	80	0.5				
					0.5				
95					0.5				183.5
								Terminated soil boring at 96'.	
100									
105									
110									
115									
120									

WELL DIAGRAM



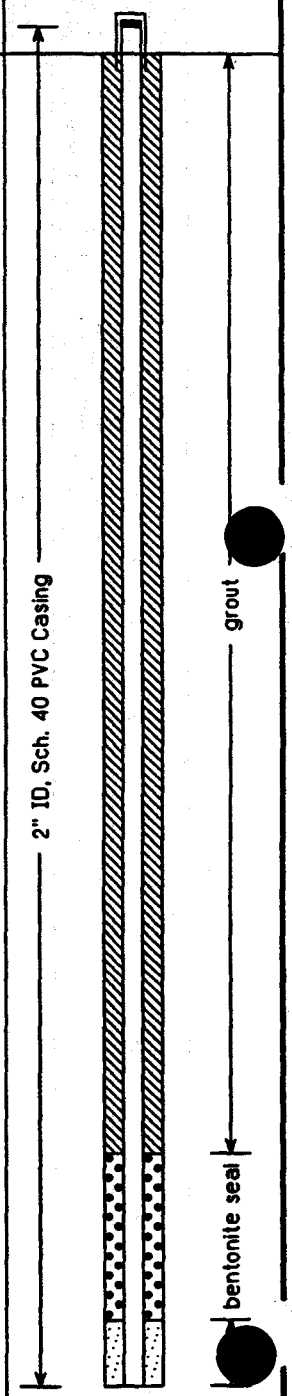
EnSafe/Allen & Hoshall

Monitoring Well 015G01UF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *279.63 feet msl*
Started at *0755 on 3-14-96*	TOC Elevation: *282.06 feet msl*
Completed at *0935 on 3-14-96*	Depth to Groundwater: *26.13 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *255.93 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *50.25 feet*
Geologist: *J. Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1					(0'-2') Hand-augered. Silt, light brown to yellowish-brown in color.	
								(2'-15') Clayey silt, yellowish-brown to yellowish-gray in color mottled with dark yellowish-orange stained material.	
5								(5'-10') Abundant organic material.	
		◢	2						
10									
							ML	(12'-16') Moist.	
15		◢	3					Color change to olive gray/greenish-gray near 15'.	
								(16'-23') Silt, moist.	
20									
								Increasing clay fraction, less moist, color changes to brownish-gray at 23'.	
25									253.6
								(26'-32') Silt and clay, greenish-gray to brownish-gray in color. Iron-stained inclusions/nodules present.	
30							ML CL	(32'-35') Greenish-gray to light brown color.	
35							SM	(35'-50') Fluvial Deposits.	244.6
							SW	(35'-36') Silty sand with some clay, fine to medium-grained, reddish-brown to dark yellowish-orange and gray in color.	243.6
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 015G01UF
Project: *NSA Memphis*	Location: *Millington, TN. . SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *279.63 feet msl*
Started at *0755 on 3-14-96*	TOC Elevation: *282.06 feet msl*
Completed at *0935 on 3-14-96*	Depth to Groundwater: *26.13 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *255.93 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *50.25 feet*
Geologist: *J. Kingsbury*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45							SW	(36'-38') Sand, fine to medium-grained, light brown to dark yellowish- orange color mottled with light gray-colored material. Color changes to dark yellowish-orange from 43' to 46'. (46'-50') Sand, medium to coarse-grained, with a trace of pea-size gravel, dark yellowish-orange to pinkish-gray.		0.01 Slot, PVC Screen 3" PVC End Cap 10/20 sand
50								Terminated soil boring at 50'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 015G01LF.	229.6	
55										
60										
65										
70										
75										
80										

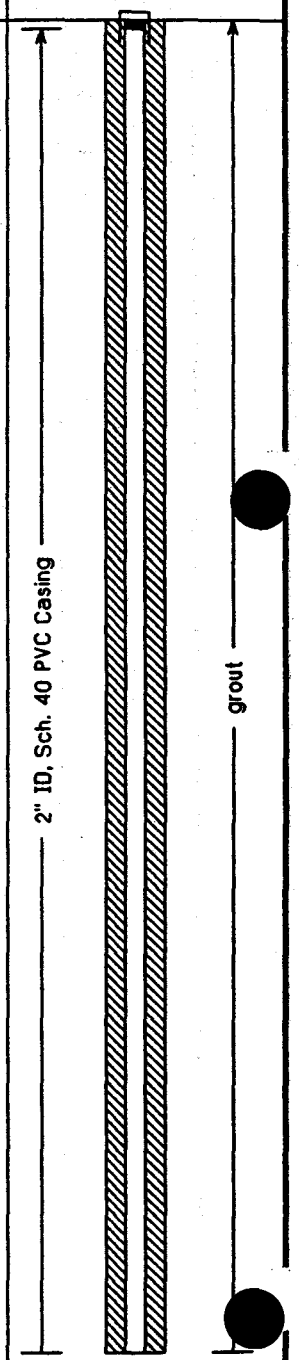
EnSafe/Allen & Hoshall

Monitoring Well 015G02LF

Project: *NSA Memphis*	Location: *Millington, TN* · *SWMU#15*
Project No.: *0094-08420*	Surface Elevation: *283.36 feet msl*
Started at *0819 on 3-6-96*	TOC Elevation: *282.85 feet msl*
Completed at *1011 on 3-6-96*	Depth to Groundwater: *26.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *256.39 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100				(0'-.5') Concrete.	
			2	100	BG		SW SC	(.5'-2') Hand-augered. Sand, gravel, and clay fill from 0.5' to 3.5'.	
					BG				279.9
			3	88			ML	(3.5'-6') Clayey silt, olive gray to moderate yellowish-brown in color. Mostly olive gray-colored near 3.5', locally stained dark yellowish-orange with some organic material.	
5					BG				277.4
					BG		ML	(6'-18') Silt, moderate yellowish-brown mottled with light olive-gray material.	
					BG				
10			4	65	BG			Moist below 11'.	
					BG				
15					BG			(16'-18') Very moist.	
					3.2				265.4
					31		ML	(18'-25') Clayey silt, dark yellowish-brown in color, becoming dark yellowish-brown to moderate yellowish-brown near 25'.	
20			5	90	BG				
					BG				
25					BG				258.4
					17		ML	(25'-30') Silt (see descriptions below) (25'-26') Dark yellowish-brown with dark yellowish-orange staining.	
					51			(26'-30') Moderate yellowish-brown mottled with light olive gray and dark yellowish-orange material.	
30							ML CL		253.4

WELL DIAGRAM



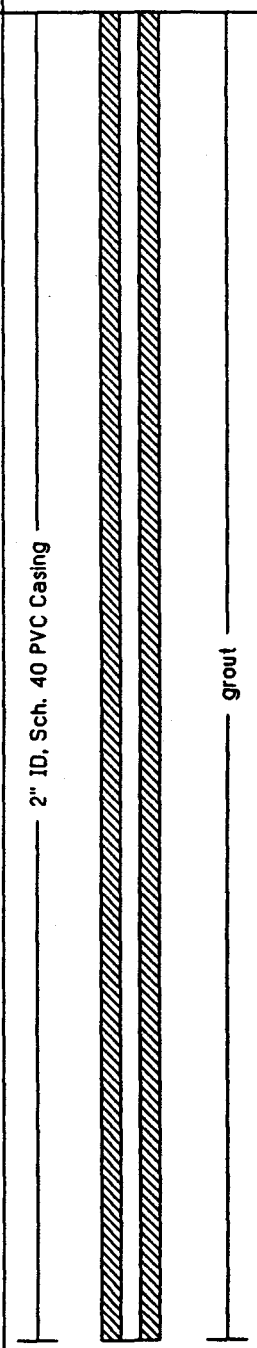
EnSafe/Allen & Hoshall

Monitoring Well 015G02LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU#15*
Project No.: *0094-08420*	Surface Elevation: *283.36 feet msl*
Started at *0819 on 3-6-96*	TOC Elevation: *282.85 feet msl*
Completed at *1011 on 3-6-96*	Depth to Groundwater: *26.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *256.39 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									253.4
			6	130	112		ML CL	(30'-33') Silt and clay, moderate yellowish-brown color mottled with sparse light olive-gray material. Progressively sandier near 33'.	
					131		SC SM	(33'-86.5') Fluvial Deposits.	250.4
35					17		SC	(33'-35') Silty and clayey sand, very fine to fine-grained, moderate yellowish-brown color mottled with sparse light olive gray material, contains iron-manganese nodules. Silt and clay content decrease near 35'.	248.4
					13		SP	(35'-36') Clayey sand, very fine to fine-grained, light brown to moderate reddish-brown color mottled with light olive gray material, contains iron concretions.	247.4
40			7	100	10		SP	(36'-39') Sand, fine-grained, light brown to moderate reddish-brown color mottled with yellowish-gray material, wet.	244.4
					2.2		SP	(39'-43') Sand, fine-grained olive gray mottled with sparse yellowish- gray material.	240.4
45					BG		SP	(43'-46') Sand, fine-grained, yellowish-gray in color, wet.	
					BG		SP	(46'-52') Sand, fine-grained with rare clay seams, light brown mottled with grayish-orange material, wet.	237.4
50			8	100	BG		SP		
					BG		SP	(52'-63') Sand, fine-grained, grayish-orange in color, wet. Rare piece of gravel at 54', and a light gray clay seam at 55'.	231.4
55					BG		SP		
					BG		SP		
60					BG		SP		

WELL DIAGRAM



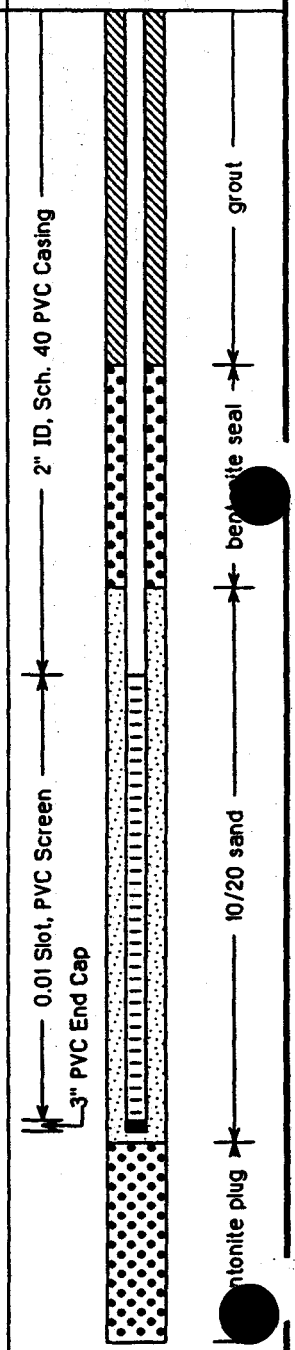
EnSafe/Allen & Hoshall

Monitoring Well 015G02LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU#15*
Project No.: *0094-08420*	Surface Elevation: *283.36 feet msl*
Started at *0819 on 3-6-96*	TOC Elevation: *282.85 feet msl*
Completed at *1011 on 3-6-96*	Depth to Groundwater: *26.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *256.39 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			9	80	BG		SP		
					BG			(63'-75.5') Sand and gravel (see descriptions below).	220.4
65					BG			(63'-66') Sand (fine to very coarse-grained) and gravel (up to 1" in longest dimension). Grayish-orange to dark yellowish-orange in color. Wet. Gravel is mostly composed of quartz and chert. Gravel is scattered near 63'.	
					BG				
					BG		SW GW	(66'-75.5') Sand, medium to very coarse-grained, and gravel (up to 1.5" in longest dimension). Gravel is angular to rounded quartz and chert. Dark yellowish-orange to grayish-orange in color. Wet.	
70			10	80	BG				
					BG			3" thick, fine-grained sand lense at 75', very little gravel content, and grayish-orange in color.	
75					BG				
							SP	(75.5'-76') Sand, fine-grained, grayish-orange, wet.	207.9 207.4
					BG			(76'-86.5') Sand (coarse to very coarse-grained) and gravel (up to 2" in longest dimension). Dark yellowish-orange to moderate yellowish- brown, mottled with finer-grained graysish-orange sand near 79', 80', 84', and 86'. Wet.	
80					BG				
			11	90	BG		SW GW		
					BG				
85					BG			(86'-86.5') Becoming clayey.	
					BG		SC	(86.5'-87') Cockfield Formation: Very clayey sand, fine-grained, yellowish-gray mottled with very light gray and dark yellowish-orange material.	196.9 196.4
					BG		SM SC		
90									

WELL DIAGRAM



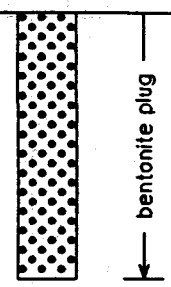
EnSafe/Allen & Hoshall

Monitoring Well 015G02LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU#15*
Project No.: *0094-08420*	Surface Elevation: *283.36 feet msl*
Started at *0819 on 3-6-96*	TOC Elevation: *282.85 feet msl*
Completed at *1011 on 3-6-96*	Depth to Groundwater: *26.46 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *256.39 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *75 to 85 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			12	100	BG		SM SC	(87'-93') Silty sand, fine-grained, with some light gray clay seams, yellowish-gray in color mottled with dark yellowish-orange material, very wet.	190.4
					BG		SP	(93'-96') Fine-grained sand with a few thin clay seams, yellowish-gray mottled with sparse dark yellowish-orange material, wet.	187.4
95					BG			Terminated soil boring at 96'.	
100									
105									
110									
115									
120									

WELL DIAGRAM



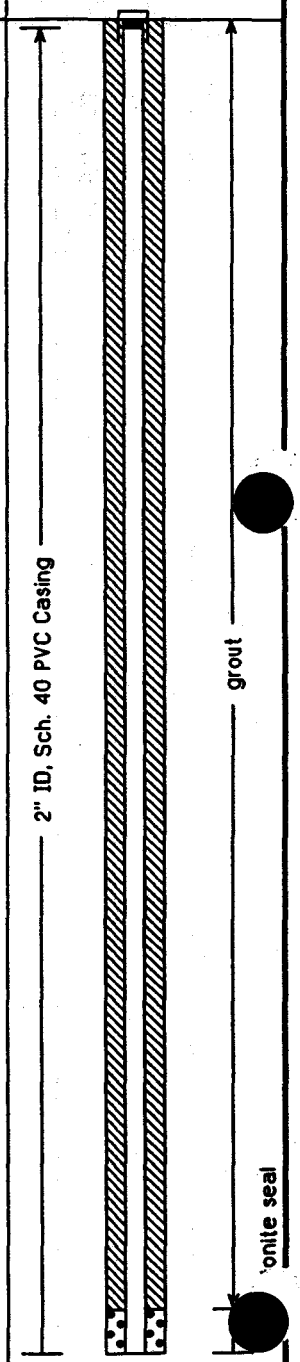
EnSafe/Allen & Hoshall

Monitoring Well 015G02UF

Project: *NSA Memphis*	Location: *Millington, TN.* *SWMU#15*
Project No.: *0094-08420*	Surface Elevation: *283.20 feet msl*
Started at *0800 on 3-11-96*	TOC Elevation: *283.00 feet msl*
Completed at *1000 on 3-11-96*	Depth to Groundwater: *25.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *257.13 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *46.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1				SW SC	(0'-.5') Concrete. (.5'-2') Hand-augered. Sand, gravel, and clay fill from .5' to 3.5'.	279.7
5							ML	(3.5'-6') Clayey silt, olive gray to moderate yellowish-brown in color. Mostly olive gray-colored near 3.5', locally stained dark yellowish-orange with some organic material.	277.2
		◢	2				ML	(6'-18') Silt, moderate yellowish-brown mottled with light olive-gray material. Moist below 11'.	
10									
15		◢	3					(16'-18') Very moist.	265.2
20							ML	(18'-25') Clayey silt, dark yellowish-brown in color. Becoming dark yellowish-brown to moderate yellowish-brown near 25'.	258.2
25							ML	(25'-30') Silt. Dark yellowish-brown with dark yellowish-orange staining from 25' to 26', becoming moderate yellowish-brown mottled with light olive gray and dark yellowish-orange material between 26' and 30'.	253.2
30							ML CL		

WELL DIAGRAM



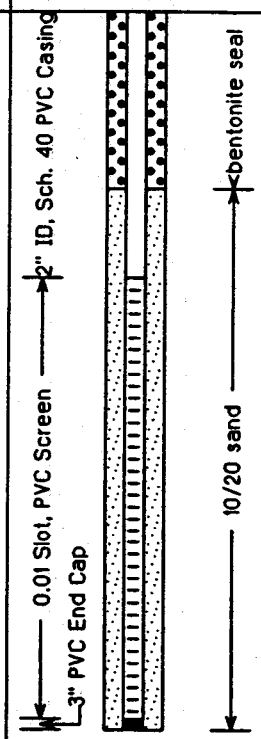
EnSafe/Allen & Hoshall

Monitoring Well 015G02UF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU#15*
Project No.: *0094-08420*	Surface Elevation: *283.20 feet msl*
Started at *0800 on 3-11-96*	TOC Elevation: *283.00 feet msl*
Completed at *1000 on 3-11-96*	Depth to Groundwater: *25.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *257.13 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *46.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML CL	(30'-33') Silt and clay, moderate yellowish-brown color mottled with sparse light olive-gray material. Progressively sandier near 33'.	253.2
							SC SM	(33'-46') Fluvial Deposits.	250.2
35							SC	(33'-35') Silty and clayey sand, very fine to fine-grained, moderate yellowish-brown color mottled with sparse light olive gray material, contains iron-manganese nodules. Silt and clay decrease near 35'.	248.2
							SP	(35'-36') Clayey sand, very fine to fine-grained, light brown to moderate reddish-brown color mottled with light olive gray material, contains iron concretions.	247.2
40			4				SP	(36'-39') Sand, fine-grained, light brown to moderate reddish-brown color mottled with yellowish-gray material, wet.	244.2
			5				SP	Sand, fine-grained olive gray mottled with sparse yellowish-gray material. (40'-42') Collected a Shelby tube sample.	240.2
45								(43'-46') Sand, fine-grained, yellowish-gray in color, wet.	237.2
50								Terminated soil boring at 46'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 015G02LF.	
55									
60									

WELL DIAGRAM



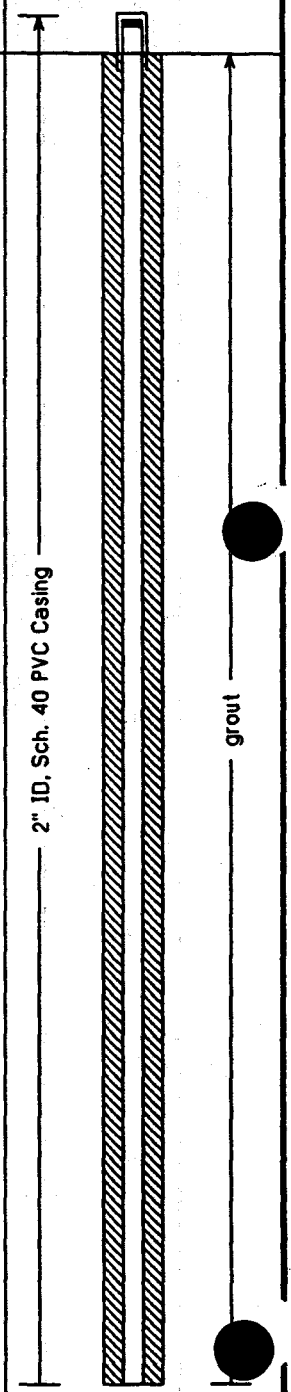
EnSafe/Allen & Hoshall

Monitoring Well 015G03LF

Project: *NSA Memphis*	Location: *Millington, TN.* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *280.29 feet msl*
Started at *1215 on 3-11-96*	TOC Elevation: *282.55 feet msl*
Completed at *1600 on 3-11-96*	Depth to Groundwater: *26.60 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *256.35 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J. Kingsbury*	Well Screen: *78 to 88 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					4.2		SW/GW	(0'-2') Sand and gravel (fill).	278.3
			1	83	3.1		ML	(2'-6') Silt, reddish-brown to olive gray in color, with some gravel (fill).	274.3
5					2				
					1.5		ML	(6'-16') Clayey silt, olive gray to yellowish-brown, organic material present.	
					1.1				
10			2	50	1.3				
					0.6				
15					0.4				264.3
					0.0		ML	(16'-24') Silt, yellowish-brown to yellowish-gray in color and mottled with dark yellowish-orange-colored material. Moist.	
					0.4				
20			3	100	0.4				
					0.4				
25					0.4			(24'-26') Color changes to olive gray to greenish-gray.	254.3
					0.4		ML	(26'-36') Clayey silt (see descriptions below). (26'-32') Greenish-gray to olive gray in color, organic material with iron staining present.	
					0.4				
30			4	80	0.4			(32'-36') Mottled light olive gray and light brown in color.	
					0.4				
35					0.4				244.3
					0.4		CL/ML	Clay, silt, and fine-grained sand, with a trace amount of gravel. Mottled reddish-brown to yellowish-brown/light olive gray in color, moist to wet. Fluvial deposits contact estimated at 42' based on geophysical log interpretation.	
40					0.4				

WELL DIAGRAM



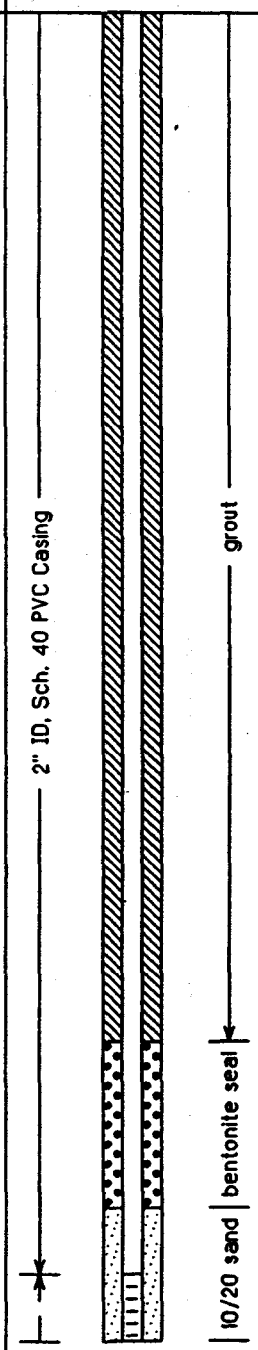
EnSafe/Allen & Hoshall

Monitoring Well 015G03LF

Project: *NSA Memphis*	Location: *Millington, TN.* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *280.29 feet msl*
Started at *1215 on 3-11-96*	TOC Elevation: *282.55 feet msl*
Completed at *1600 on 3-11-96*	Depth to Groundwater: *26.60 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *256.35 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J. Kingsbury*	Well Screen: *78 to 88 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	110	0.4		CL ML		
					0.4				
45					0.4				234.3
					0.4		SC	Clayey sand, fine to medium-grained, mottled olive gray to reddish- brown in color, dense, with some iron concretions near 50'.	
					0.4				
50			6	110	0.4				229.3
					0.4		SW	Sand, fine to coarse-grained, yellowish-brown to yellowish-gray in color. With gravel from 55' to 56'. Coarsening from 51'-56'.	
55					0.4				224.3
					0.4		SW GW	Sand and gravel, yellowish-gray in color.	222.3
					0.4		ML CL	Silt and clay, yellowish-brown in color.	221.3
60			7	110	0.4		SW	Sand, medium to coarse-grained, reddish-brown in color.	
					0.4				217.3
65					0.4			Sand and gravel; sand is medium to coarse-grained, reddish-brown. (66'-67') Reddish-brown to dark yellowish-orange in color.	
					0.4				
70			8	100	0.4		SW GW		
					0.4				
75					0.4				
					1.0				
80					0.8				

WELL DIAGRAM



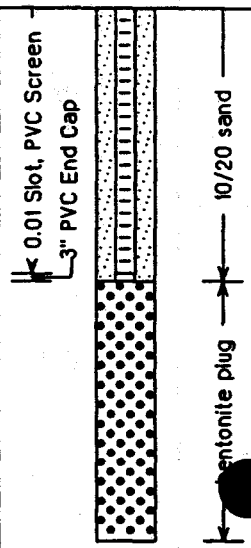
EnSafe/Allen & Hoshall

Monitoring Well 015G03LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *280.29 feet msl*
Started at *1215 on 3-11-96*	TOC Elevation: *282.55 feet msl*
Completed at *1600 on 3-11-96*	Depth to Groundwater: *26.60 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *256.35 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J. Kingsbury*	Well Screen: *78 to 88 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			9	100	1.1		SW/GW		
					1.1		SW	Estimated contact of sand and gravel unit with underlying sand unit is at 82'. Some fine-grained yellowish-gray to olive gray sand is present around 82'; however due to drilling/sampling problems; the lithology between 81' and 86' is somewhat uncertain. At 86', sand is fine to coarse-grained, with some gravel (up to 2" in longest dimension).	198.3
85					1.1				
					0.6				192.3
					0.4		SC	(88-96') Cockfield Formation: Clayey, fine-grained sand, dark yellowish-orange.	
90			10	100	0.4				189.3
					0.4		SP/SC	Sand, fine-grained, olive-gray to moderate gray, with some clay stringers, wet.	
95					0.4				184.3
								Terminated soil boring at 96'.	
100									
105									
110									
115									
120									

WELL DIAGRAM



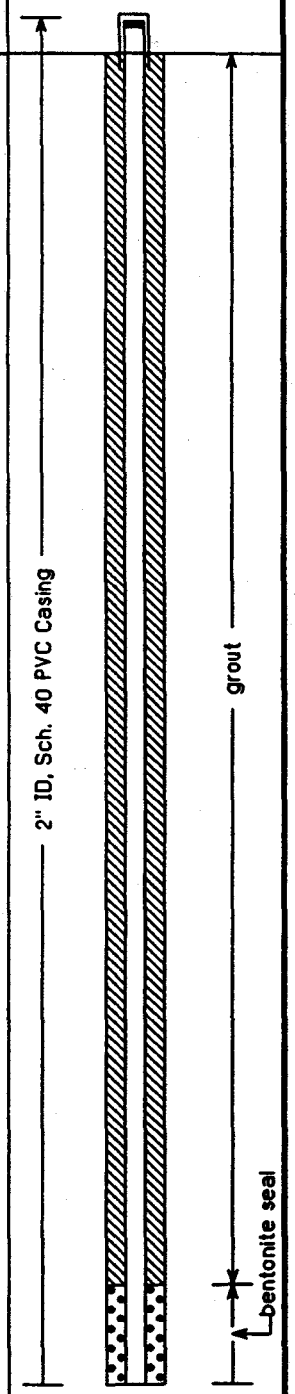
EnSafe/Allen & Hoshall

Monitoring Well 015G03UF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *280.10 feet msl*
Started at *0950 on 3-12-96*	TOC Elevation: *282.36 feet msl*
Completed at *1230 on 3-12-96*	Depth to Groundwater: *25.35 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *257.01 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55 feet*
Geologist: *J. Kingsbury*	Well Screen: *44 to 54 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1				SW GW	(0'-2') Sand and gravel (fill).	278.1
5							ML	(2'-6') Silt, reddish-brown to olive gray in color, with some gravel (fill).	274.1
		◢	2				ML	(6'-16') Clayey silt, olive gray to yellowish-brown, organic material present.	264.1
10									
15		◢	3				ML	(16'-24') Silt, yellowish-brown to yellowish-gray in color and mottled dark yellowish-orange-colored material. Moist.	254.1
20									
25								(24'-26') Olive gray to greenish-gray.	
30							ML	(26'-36') Clayey silt (see descriptions below). (26'-32') Greenish-gray to olive gray in color, organic material with iron staining present from 26' to 32'. (32'-36') Mottled light olive gray and light brown in color.	244.1
35									
40							CL ML	Clay, silt, and fine-grained sand with a trace amount of gravel. Mottled reddish-brown to yellowish-brown/light olive gray in color, moist to wet. Fluvial deposits contact estimated at 42' based on geophysical log interpretation.	

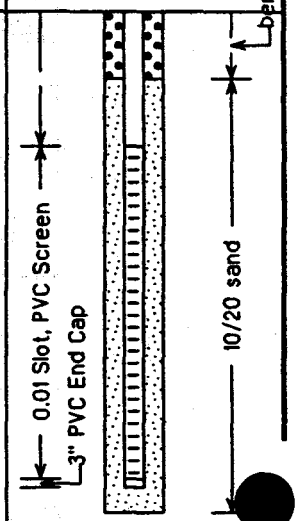
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 015G03UF
Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *280.10 feet msl*
Started at *0950 on 3-12-96*	TOC Elevation: *282.36 feet msl*
Completed at *1230 on 3-12-96*	Depth to Groundwater: *25.35 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *257.01 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *55 feet*
Geologist: *J. Kingsbury*	Well Screen: *44 to 54 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45							CL ML		
							SC	Clayey sand, fine to medium-grained, mottled olive gray to reddish- brown in color, dense, with some iron concretions near 50'.	234.1
50							SW	Sand, fine to coarse-grained, yellowish-brown to yellowish-gray in color.	229.1
55								Terminated soil boring at 55'. Note: No samples were collected for lithologic description. Descriptions were transferred from the log of adjacent monitoring well 015G03LF.	225.1
60									
65									
70									
75									
80									

WELL DIAGRAM



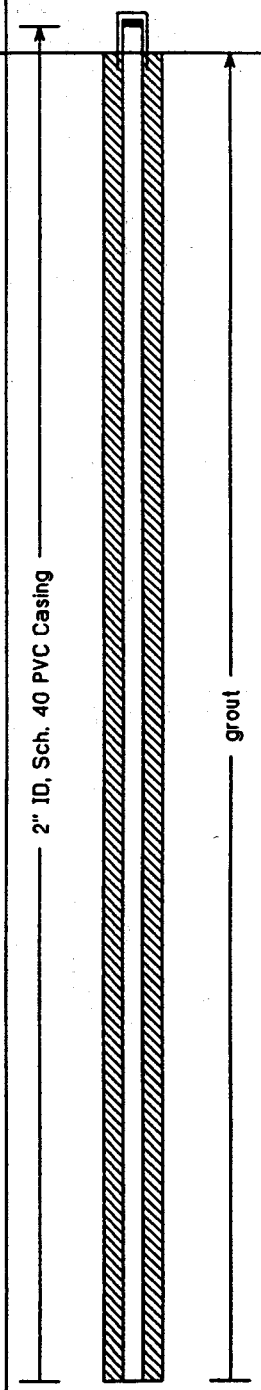
EnSafe/Allen & Hoshall

Monitoring Well 015G04LF

Project: *NSA Memphis*	Location: *Millington, TN SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *278.00 feet msl*
Started at *1330 on 3-12-96*	TOC Elevation: *280.41 feet msl*
Completed at *1640 on 3-12-96*	Depth to Groundwater: *25.58 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *254.83 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *106 feet*
Geologist: *J. Kingsbury*	Well Screen: *86 to 96 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100				(0'-4') Hand augered. Silt, moderate brown to reddish-brown in color.	
5					1.7			Slightly clayey silt, light brown to yellowish-brown in color and mottled with yellowish-gray clay, moist.	
					0.9				
					0.7				
10								(10'-16') Some organics and iron-staining.	
					0.4				
			2	125					
					0.7		ML		
15					0.7			(15'-16') Abundant iron-staining.	
								(16'-20') Reddish-brown to light brown in color.	
					0.7				
					0.4				
20			3	110	0.9			(20'-26') Silt, minor clay, yellowish-brown with some yellowish-gray and dark orangish-yellow mottling.	
					0.7				
25					0.7				
					0.2		ML SC	(26'-28') Silt, brown, with fine-grained sand and clay.	252
					1.2			(28'-96') Fluvial deposits: Sand, fine to medium-grained, with some silt and clay. Reddish-brown to light brown in color.	250
30			4	100	0.2		SM SC		
					0.9				245
35					1.2		SP	(33'-36') Sand, medium-grained. Yellowish-gray to dark yellowish- orange andpinkish-gray in color. Wet.	242
					0.7		SW	(36'-59') Sand, medium to coarse-grained, yellowish-gray to dark yellowish-orange and pinkish-gray in color.	
40					0.6				

WELL DIAGRAM



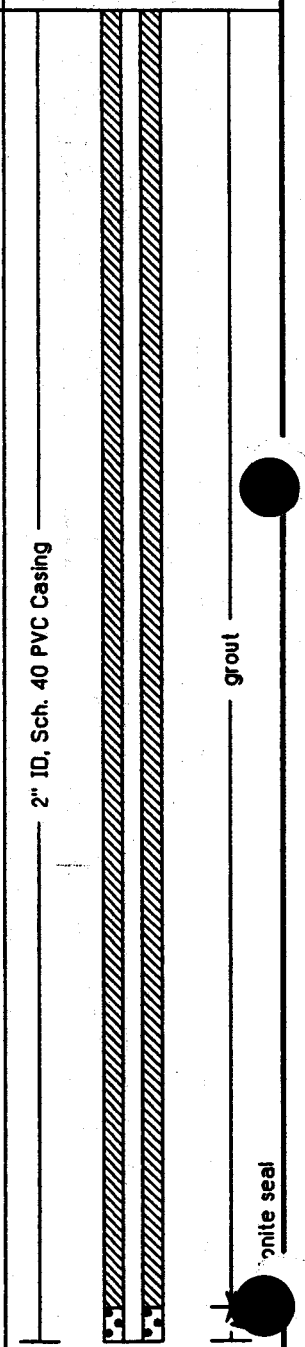
EnSafe/Allen & Hoshall

Monitoring Well 015G04LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *278.00 feet msl*
Started at *1330 on 3-12-96*	TOC Elevation: *280.41 feet msl*
Completed at *1640 on 3-12-96*	Depth to Groundwater: *25.58 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *254.83 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *106 feet*
Geologist: *J. Kingsbury*	Well Screen: *86 to 96 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			5	110	1.2				
					1.2				
45					1.4				
					1.4			(46'-48') Sand is pinkish-gray to orangish-yellow in color and fine to medium-grained. Micaceous.	
					3.8		SW	(48'-59') Yellowish-gray to light gray in color. Micaceous.	
50			6	110	5.3				
					4.9				
55					0.4				
					5.6				219
60			7	100			SW GW	(59'-66') Sand and gravel (pea-size to 1" in longest dimension). Yellowish-gray to brownish-gray in color.	
					3.1			(64'-66') Increase in gravel fraction.	
65									212
							SP	(66'-69') Very coarse sand with some pea-size gravel. Dusky yellow in color.	
					0.4				209
							CL	(69'-70') Clay. Very light yellowish-gray in color.	208
70			8	100			SW	(70'-73') Sand, fine to medium-grained, pinkish-gray to yellowish-gray in color.	205
					0.2			(73'-86') Sand (very coarse-grained) and gravel (up to 1" in longest dimension). Yellowish-gray to dusky yellow in color.	
75							SP GW		
					0.2				
80									

WELL DIAGRAM



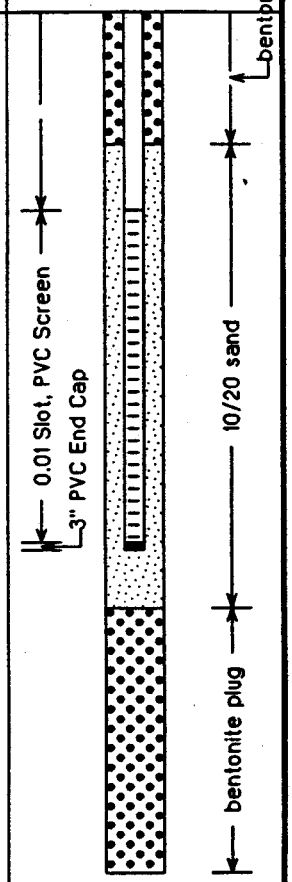
EnSafe/Allen & Hoshall

Monitoring Well 015G04LF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *278.00 feet msl*
Started at *1330 on 3-12-96*	TOC Elevation: *280.41 feet msl*
Completed at *1640 on 3-12-96*	Depth to Groundwater: *25.58 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *254.83 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *106 feet*
Geologist: *J. Kingsbury*	Well Screen: *86 to 96 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			9	70	0.2		SP GW		
85									192
					0.2			(86'-95') Sand, very coarse-grained, with some gravel, yellowish-gray to dusky yellow.	
90			10	100			SP		
					0.2			Sand becomes reddish-brown in color. Some gravel present. (94'-95') Iron-cemented sand.	
95									183
							SP GW	(95'-96') Sand and gravel.	182
					0.2			(96-106') Cockfield Formation: Fine-grained sand, with a few thin lenses of brown stiff clay from 96' to 105'. Moderate gray. Between 105'and 106', color changes to reddish-brown and yellowish-orange with some gravel present (possibly carried down from above).	
100			11	100			SP		
105									172
								Terminated soil boring at 106'.	
110									
115									
120									

WELL DIAGRAM



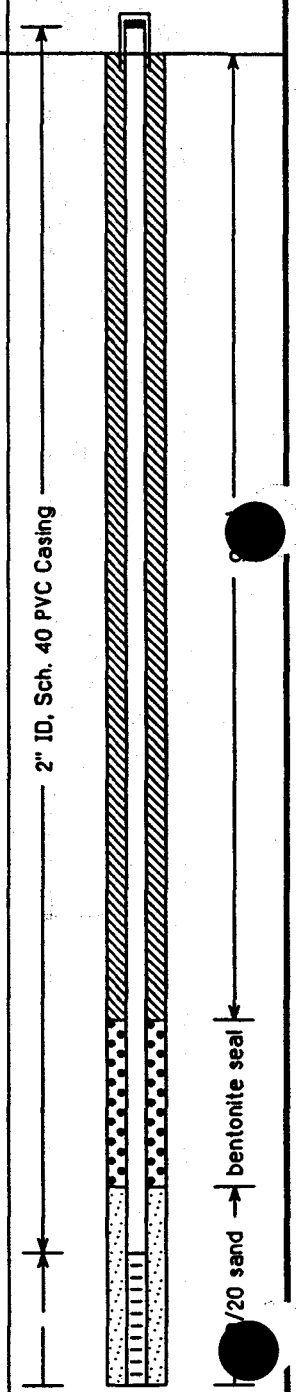
EnSafe/Allen & Hoshall

Monitoring Well 015G04UF

Project: *NSA Memphis*	Location: *Millington, TN* *SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *278.14 feet msl*
Started at *0930 on 3-13-96*	TOC Elevation: *280.55 feet msl*
Completed at *1115 on 3-13-96*	Depth to Groundwater: *24.64 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *255.91 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *46.25 feet*
Geologist: *J. Kingsbury*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1					(0'-4') Hand augered. Silt, moderate brown to reddish-brown in color.	
5								Slightly clayey silt, light brown to yellowish-brown in color and mottled with yellowish-gray clay, moist.	
		◢	2						
10								(10'-16') Some organics and iron-staining.	
							ML		
15								(15'-16') Abundant iron-staining.	
		◢	3					(16'-20') Reddish-brown to light brown in color.	
20								(20'-26') Silt, minor clay, yellowish-brown with some yellowish-gray and dark orangish-yellow mottling.	
25									252.1
							ML SC	(26'-28') Silt, brown, with fine-grained sand and clay.	250.1
								(28'-46') Fluvial Deposits.	
30							SM SC	(28'-33') Sand, fine to medium-grained, with some silt and clay.	
								(continued from previous page) Reddish-brown to light brown in color.	245.1
35							SP	(33'-36') Sand, medium-grained. Yellowish-gray to dark yellowish- orange and pinkish-gray in color. Wet.	242.1
							SW	(36'-46') Sand, medium to coarse-grained, yellowish-gray to dark yellowish-orange and pinkish-gray.	
40									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 015G04UF
Project: *NSA Memphis*	Location: *Millington, TN. SWMU #15*
Project No.: *0094-08420*	Surface Elevation: *278.14 feet msl*
Started at *0930 on 3-13-96*	TOC Elevation: *280.55 feet msl*
Completed at *1115 on 3-13-96*	Depth to Groundwater: *24.64 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing.*	Groundwater Elevation: *255.91 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *46.25 feet*
Geologist: *J. Kingsbury*	Well Screen: *36 to 46 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SW			3" PVC End Cap; 10/20 sand
45									232.1	
								Soil boring terminated at 46'. Note: No samples were collected for lithologic description. Descriptions were transferred from the log for adjacent monitoring well 015G04LF.		
50										
55										
60										
65										
70										
75										
80										

SWMU 18

ENSAFE

BORING LOG of 018G01LS

NSA MIDSOUTH
Millington, TN.

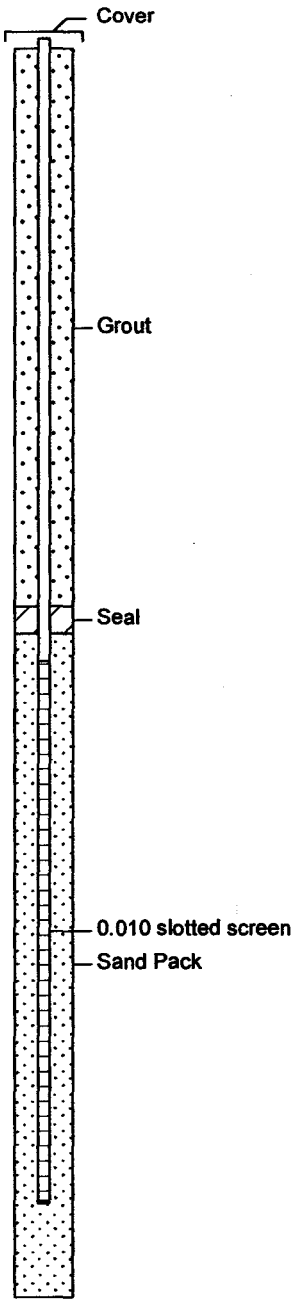
Location: SWMU 18

Project #: CTO 0094

Started	: 1400 4/12/99	Northing	: 391519.36
Finished	: 0900 4/13/99	Easting	: 814582.60
Drilling Method	: Rotosonic	TOC Elevation	: 289.07
Drilling Company	: Allinance	Total Depth	: 92.5 feet
Geologist	: C. Davis	Well Screen	: 46 to 86 feet

Depth in Feet	Surf. Elev. 289.31	SAMPLES	% Recovery	PID (ppm)	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
0	288	1	80			ML	(0-1) Concrete and fill material (1-7) Orangish brown silty clay, moist
5	283						
10	278	2	100			ML	(8-11) Orangish brown silt, moist (11-18) orangish brown silt w/ iron staining and concretions or nodules, moist
15	273						
20	268	3	100			SP	(18.5 - 20) Lt. orangish-brown fine sand, moist (20 - 24) Bright organgish-brown fine sand, moist
25	263					CL	(24-28) Pale orangish-brown to yellowish-gray slightly silty clay w/ minor portions of very fine sandy clay, moist
30	258	4	100			ML	(28 -32) Orangish-brown to yellowish-orange-gray very clayey silt w/ iron staining and concretions, moist (32 -34) Orangish-brown to yellowish-orange-gray, very fine sandy clayey silt, moist
35	253					MH	(34 -36) Pale orangish-brown, slightly silty, micaceous sand (very fine to fine), moist
40	248	5	100			ML ML	(36 - 38) Lt. gray, very fine to fine sand, very micaceous (muscovite), very moist
45	243					SW	(38 - 42) Lt. gray and pale orangish gray mottled silt w/ traces of very fine sand and iron staining, moist
50	238	6	100			SW	(42 - 43) Orangish brown fine sand layer 3" thick, then sandy clay layer 3" thick, then orangish gray clay layer 3" thick, then pale yellowish gray fine sand, moist (43 - 48) Pale orangish to pale yellowish gray fine to med. sand, very moist to wet
55	233						
60	228	7	100				(48 - 50.5) Pale orangish gray med. to coarse sand, wet (50.5 - 65.5) Pale yellowish gray to Lt. gray med. to coarse sand w/ trace of gravel (up to 1" dia.), few very coarse sand pieces, few clay nodules (up to 2 1/2"), wet
65	223					SC	(65.5 - 68) Lt. olive gray clay w/ lignitic bands and pale yellowish gray to Lt. gray med. to coarse sand w/ trace of gravel (up to 1" dia.), moist to wet
70	218	8	80			SW	(68 - 80) Pale yellowish gray to Lt. gray med. to coarse sand w/ trace of gravel (up to 1" dia.) and clay lenses (gravel and clay content increases with depth), wet (80 - 84) Pale yellowish gray med. to coarse sand w/ gravel (up to 2 1/2" dia.) and a Lt. gray clay nodule (2 1/2" wide), wet
75	213						
80	208	9	100			ML	(84 - 86) Orangish brown and Lt. gray mottled very fine sandy silt, wet
85	203						
90	198	10	100			CL	(86 - 93) Dark brown w/ gray banding silty clay to clayey silt, moist
95							

Geoprobe: 018G01LS
Elev.: 289.07



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09-23-1

SWMU 20

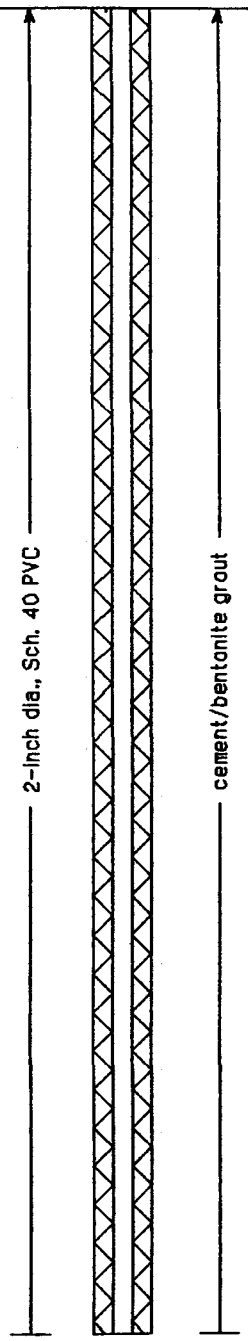
Environmental & Safety Designs, Inc.

Log of Monitoring Well 020G01LF

Project: *Assembly F - RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *268.23 feet msl*
Started at *0815 on 04-10-99*	TOC Elevation: *268.5 feet msl*
Completed at *1720 on 04-10-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *78 feet*
Geologist: *Carol Davis*	Well Screen: *48 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface Conditions: Asphalt. 020G01LF is located in the parking lot south of Building S-769.	
5									Loess. Silt,very dense. Light orange-brown.	
									No recovery.	
			1	38					Loess. Silt. Light orange-brown and gray mottled. Some slightly clayey silt in the upper 3 feet. Iron staining throughout slightly decreasing with depth. Light orange-brown with gray mottles.	
10										
15			2	80						
20								ML CL	Loess. Clayey silt. Abundant iron staining and concretions. More clay.	
25									Color change to light brown, olive gray at 24 feet.	
			3	100					Increased iron staining from 26 to 28 feet.	
30									Loess. Silt. Light olive gray. Color grades to pale orange-gray.	
			4	100					Collected Shelby tube sample	
35									Loess. Silt. Pale orange-gray. Color change to orange-brown.	
			5	100					Color change to light olive gray.	227.2
40								SM	Fluvial. Intermittent medium to coarse sand (orange-brown) and silt (light olive gray) Sand bands 2 to 3 inches thick.	

WELL DIAGRAM



EnSafe (SM)

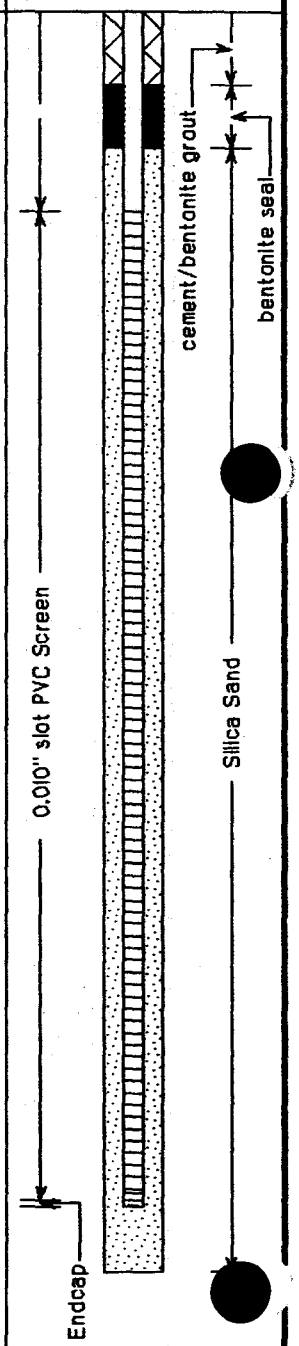
Environmental & Safety Designs, Inc.

Log of Monitoring Well 020G01LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *266.23 feet msl*
Started at *0815 on 04-10-99*	TOC Elevation: *268.5 feet msl*
Completed at *1720 on 04-10-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *78 feet*
Geologist: *Carol Davis*	Well Screen: *46 to 78 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								SM		
								SP SM	Fluvial. Gravelly sand. Sand coarse. Gravel up to 2 inches in diameter. Gravel increasing with depth. Light brownish gray.	224.2
45									Coarser sand. Color change to pale orange/yellow/brown.	
			6	100					Gravel layer at 47.25 feet. 3 inches thick.	
50									Sand and gravel. Gravel up to 3 inches in diameter.	215.7
									Fluvial. Sand, very fine to fine. Light gray. OUT OF GRAVEL.	
55										
									Fluvial. Clayey sand. Very fine to fine sand. Light gray to pale yellow-gray.	
			7	100						
60								SP	Fluvial. Sand, fine to medium grained. Light gray to pale, yellowish gray.	
									1.5-inch clay layer at 60 feet. Very light brown.	
65										
									Change to yellowish-gray fine sand at 67.5 to 68 feet.	
			8	100						
70								CL	Orange-brown grading to brownish gray fine to medium grained sand	197.2 / 196.2
								SP	Fluvial. Clay, with lignite layers. Dark to very dark brown.	
									Fluvial. Sand, fine to very fine grained. Brownish gray grading to olive gray.	191.7
75								SC	Fluvial. Sand, fine to very fine. Alternating layers of brown and olive gray.	190.2
								CL		
			9	100					Cockfield. Clay, with lignite. Dense. Dark olive brown.	188.2
80									TD of borehole at 78 feet bgs.	

WELL DIAGRAM



SWMU 21

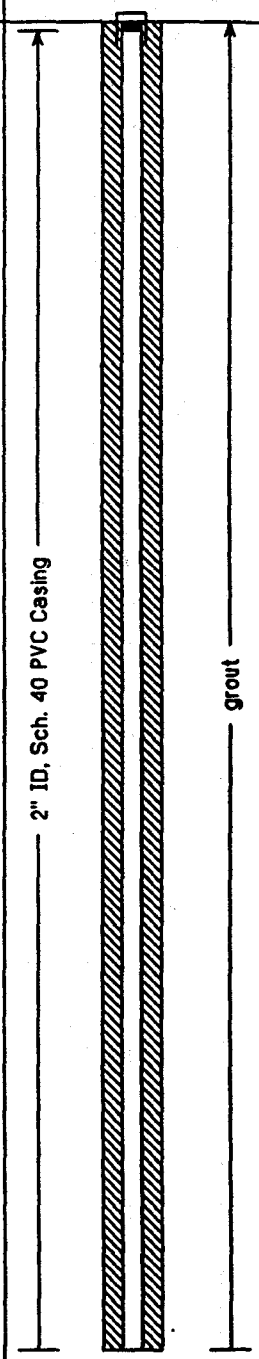
EnSafe/Allen & Hoshall

Monitoring Well 021G01LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *0730 on 2-20-96*	TOC Elevation: *293.42 feet msl*
Completed at *1405 on 2-20-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *80 to 90 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
5			1	0	BG			(0'-6') No recovery; concrete clogged core barrel.	287.8
10, 15			2	35	BG		ML	(6'-16') Clayey silt. Light brown to reddish-brown in color. (16'-18') Silt with some clay and sand, light brown.	275.8
							SP	(18'-20') Sand, medium-grained, light brown in color.	273.8
20, 25			3	80	BG		ML	(20'26') Silt, light brown to yellowish-brown in color. (24'-26') Reddish-brown to yellowish-brown in color with minor sand and clay.	267.8
30							CL	Clay, light olive gray to dark yellowish-orange. Rare scattered gravel throughout. Some thin sand lenses from 26' to 30'. Clay becomes silty from 30' to 35'. Fluvial deposits contact estimated at 34' based on geophysical log interpretation.	

WELL DIAGRAM



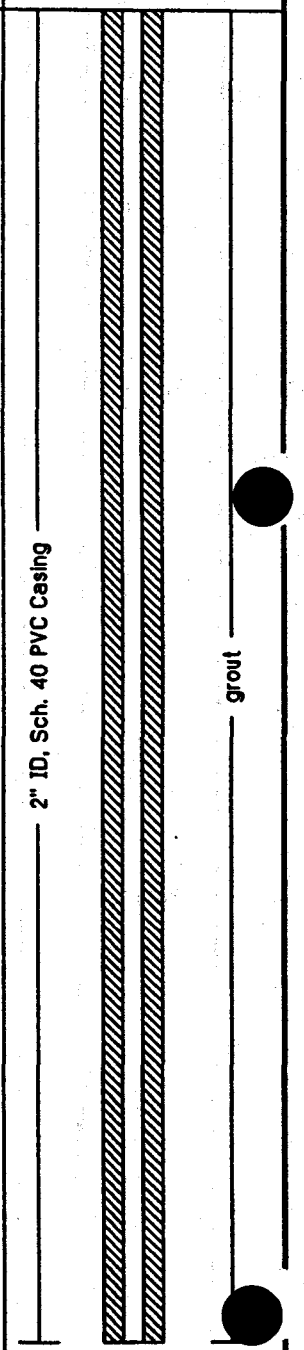
EnSafe/Allen & Hoshall

Monitoring Well 021G01LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *0730 on 2-20-96*	TOC Elevation: *293.42 feet msl*
Completed at *1405 on 2-20-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *80 to 90 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			4	120	BG		CL		
35							ML	(35'-36') Silt, light olive gray in color, some iron staining.	258.8
							ML SP	(36'-40') Silt and fine-grained sand with some clay. Light gray to light yellowish-gray.	257.8
40			5	80	BG		SW	Sand, fine to medium-grained, light yellowish-gray to yellowish- brown.	253.8
45							SW	Medium to coarse-grained, micaceous, yellowish-gray color.	
50			6	100	BG		SW		
55							SW		
							SP	(58'-60') Sand, coarse-grained, with some small gravel present, gray in color.	235.8
60							SC SM		233.8

WELL DIAGRAM



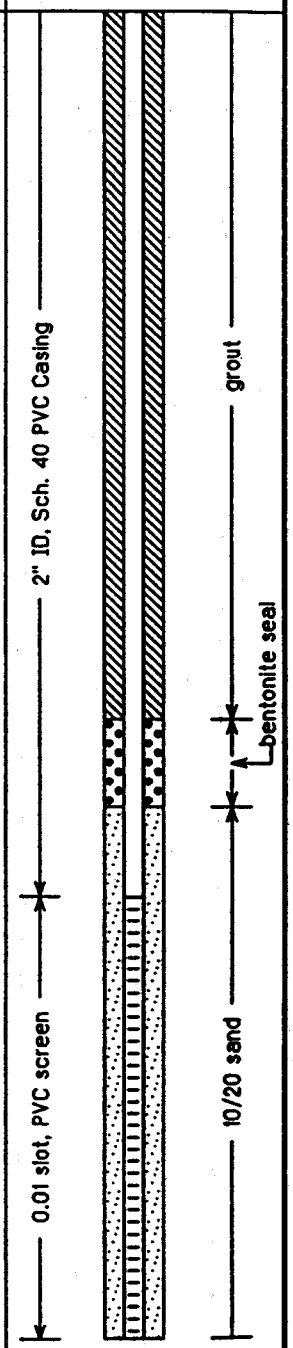
EnSafe/Allen & Hoshall

Monitoring Well 021G01LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *0730 on 2-20-96*	TOC Elevation: *293.42 feet msl*
Completed at *1405 on 2-20-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *80 to 90 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			7	100	BG		SC SM	(60'-66') Sand, fine-grained, with clay and silt stringers, yellowish- gray.	233.8
65									227.8
							CL ML	(66'-67') Silty and sandy clay. Yellowish-gray to yellowish-brown in color.	226.8
							SW SC	Sand, fine to medium-grained, yellowish-gray to very light yellowish- brown. Clay stringers between 67' and 70'.	
70			8	115	BG		SW	(70'-80') Sand fine to medium-grained, yellowish-gray to very light yellowish-brown in color.	223.8
75									
80			9	90	BG		SW SC	(80'-86') Sand, fine to medium-grained, with thin layers of clay and gravel (1" to 2" thick). Yellowish-gray to very light yellow- brown in color.	213.8
85									207.8
							SP	(86'-90') Sand, coarse-grained yellowish-gray in color. Contains some gravel from 88' to 89'. Color changes to reddish brown at 89' until 90'.	
90							ML CL		203.8

WELL DIAGRAM



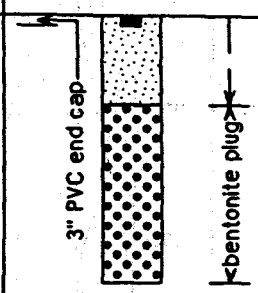
EnSafe/Allen & Hoshall

Monitoring Well 021G01LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *0730 on 2-20-96*	TOC Elevation: *293.42 feet msl*
Completed at *1405 on 2-20-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *J.A. Kingsbury*	Well Screen: *80 to 90 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			10	110	BG		ML CL	(90-96') Cockfield Formation: Silt and clay, yellowish-gray to reddish-brown in color.	203.8
							CL SP	Brown clay interstratified with fine sand.	201.8
95									197.8
								Soil boring terminated at 96'.	
100									
105									
110									
115									
120									

WELL DIAGRAM



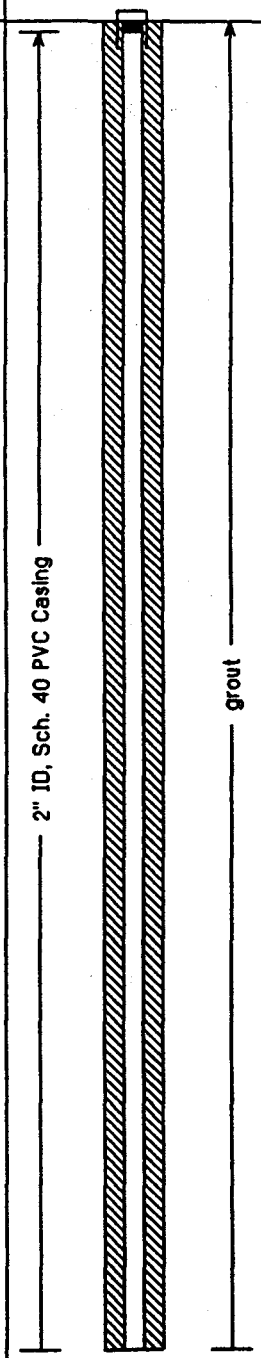
EnSafe/Allen & Hoshall

Monitoring Well 021G02LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *1235 on 2-26-96*	TOC Elevation: *293.42 feet msl*
Completed at *1635 on 2-26-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *77 to 87 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								(0'-3') Concrete and gravel.	
			1	100	BG				290.8
5							ML	(3'-9') Clayey silt. Dark yellowish-brown to moderate brown in color. (4'-6') Moist.	
									284.8
10							CL	(9'-11') Clay. Moderate brown in color, stained dark yellowish-orange and light brown. Very hard.	
			2	110	BG				282.8
15							ML	(11'-16') Sandy silt. Moderate yellowish-brown to moderate brown in color. Moist with iron-manganese nodules and very light gray sandy patches from 14' to 15', becoming more sandy near 16'.	
									277.8
							SM	(16'-16.5') Silty sand, fine to medium-grained, moderate brown to light brown color, moist.	277.3
							SC	(16.5'-18.5') Sand, fine to coarse-grained, with clay seams. Moderate yellowish-brown to dark yellowish-orange, becoming light brown near 18'.	275.3
20			3	105	BG		CL	(18.5'-26') Clay, slightly sandy. Moderate yellowish-brown to dark yellowish-orange color, mottled with light gray and moderate reddish-brown material. Reddish-brown iron concretions at 21'. Becoming more moderate reddish-brown overall and slightly sandier near 25'.	
25									

WELL DIAGRAM



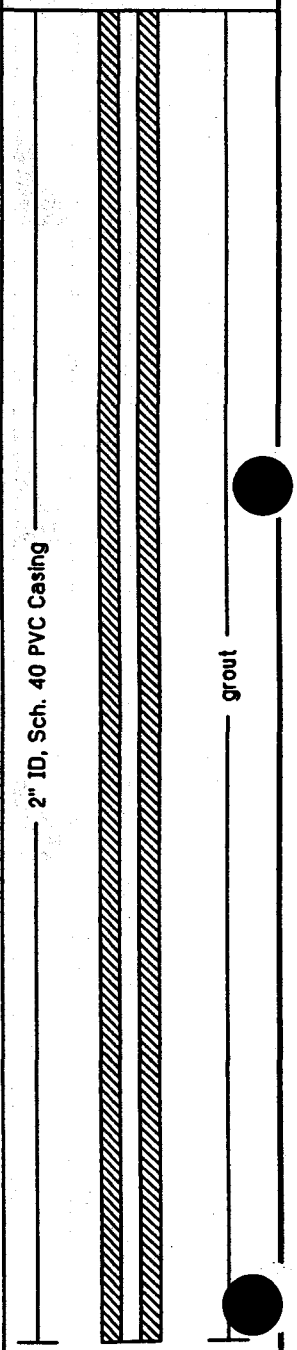
EnSafe/Allen & Hoshall

Monitoring Well 021G02LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *1235 on 2-26-96*	TOC Elevation: *293.42 feet msl*
Completed at *1635 on 2-26-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *77 to 87 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
30			4	100	BG		CL	(26'-34') Sandy clay, moderate yellowish-brown to dark yellowish- orange, mottled with light gray and moderate reddish-brown material. Contains considerable iron staining. Increase in moderate reddish-brown material near 28'. Dark iron concretions and a small piece of gravel near 28.5'.	
									259.8
35							CL SC	(34'-88') Fluvial Deposits (see descriptions below). (34'-39.5') Clay and sand, contains some sand seams, moist.	
									254.3
40			5	110	BG		SW	Pale red mottled with light gray and moderate yellowish-brown material. (39.5'-46') Sand, fine to coarse-grained, yellowish-gray, wet. Contains some slightly clayey seams. Yellowish-gray to grayish-yellow color from 39.5' to 40.5'.	
45								(46'-52') Sand, fine to coarse, yellowish-gray to grayish-yellow, slightly clayey from 46' to 48.5', with a moderate yellowish-brown clay seam at 47', wet.	
50									

WELL DIAGRAM



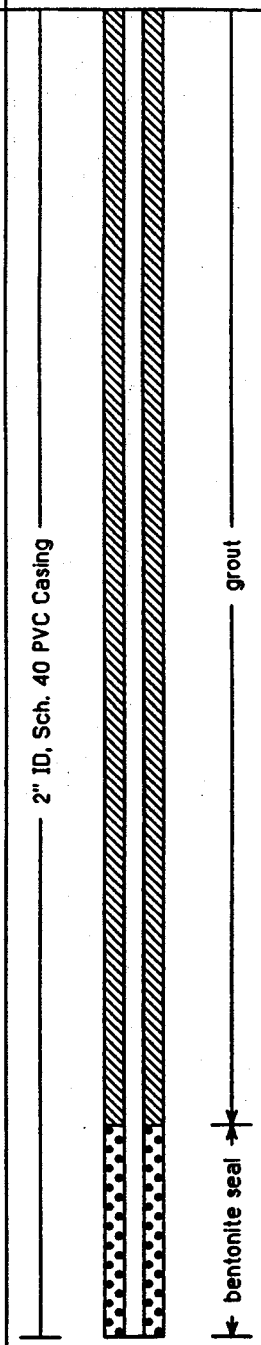
EnSafe/Allen & Hoshall

Monitoring Well 021G02LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *1235 on 2-26-96*	TOC Elevation: *293.42 feet msl*
Completed at *1635 on 2-26-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *77 to 87 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			6	95	BG		SW		
							SW	(52'-54.5') Sand, fine to coarse, with a few small clayey zones, light olive gray in color. Wet.	241.8
55							SW	(54.5'-56') Sand, fine to very coarse-grained, with some angular gravel (up to 0.75" in longest dimension). Sand is light olive gray to grayish-orange; gravel is moderate yellowish-brown. Wet.	239.3
60			7	160	BG		SW	(56'-62') Sand, fine to very coarse, with scattered angular to rounded gravel. Wet. Same color as above. From 56.5' to 58', sand becomes olive gray to moderate yellowish-brown. Gravel content increases.	
65							SC	(62'-86') Sand, fine to medium-grained, with clay seams. Sand is yellowish-gray, clay seams are yellowish-gray with some pale red material from 62' to 62.5' and 64' to 64.5'. Some reworked moderate yellowish-brown material at the top of the clay seam at 62'. With 3" thick clay seams at 67', 68', 69.5', 71', and 74'. Clay seams contain some dark yellowish-orange to moderate yellowish-brown material.	231.8
70			8	100	BG			Small piece of angular brown gravel at 73'.	
75									

WELL DIAGRAM



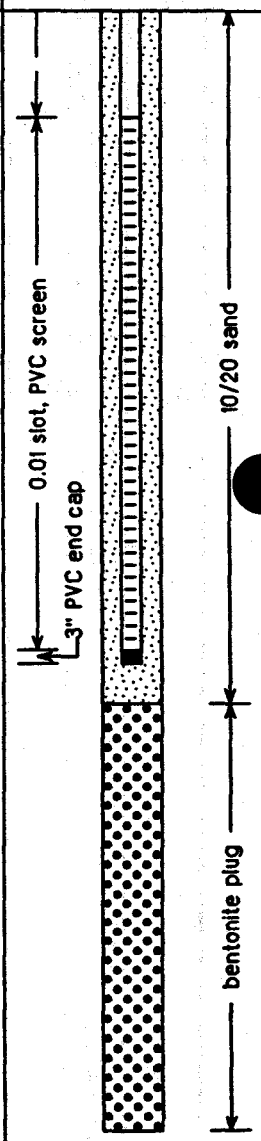
EnSafe/Allen & Hoshall

Monitoring Well 021G02LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *293.82 feet msl*
Started at *1235 on 2-26-96*	TOC Elevation: *293.42 feet msl*
Completed at *1635 on 2-26-96*	Depth to Groundwater: *34.87 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.55 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *77 to 87 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
80			9	110	BG		SC	Clay seams present at 78', 80', and 81', with some moderate yellowish-brown material above and below clay seams and some iron staining within the seams. Small gravel at 76' and 85.5'; rare small rounded gravel at 84'.	
85							SC GC SW GW	(86'-87') Very clayey sand and gravel. Sand is fine to very coarse- grained, and gravel (up to 1.5" in longest dimension) and is angular to rounded. Iron concretion near 87' (1"wide).	207.8 / 208.8 / 205.8
90			10	130	BG		CL SP	(87'-88') Sand and gravel. Sand is fine to very coarse-grained, and gravel is angular (up to 3.5" in longest dimension). Moderate yellowish-brown to dark yellowish-orange. Becomes a very fine-grained sand near 88', banded dark yellowish-orange and light gray in color.	
95								(88'-96') Cockfield Formation. Silty clay and very fine-grained sand. Dark yellowish-brown to dusky yellowish-brown in color. Laminations of light olive gray-colored fine sand are present. Marcasite is present near 95'.	197.8
100								Terminated soil boring at 96'.	

WELL DIAGRAM



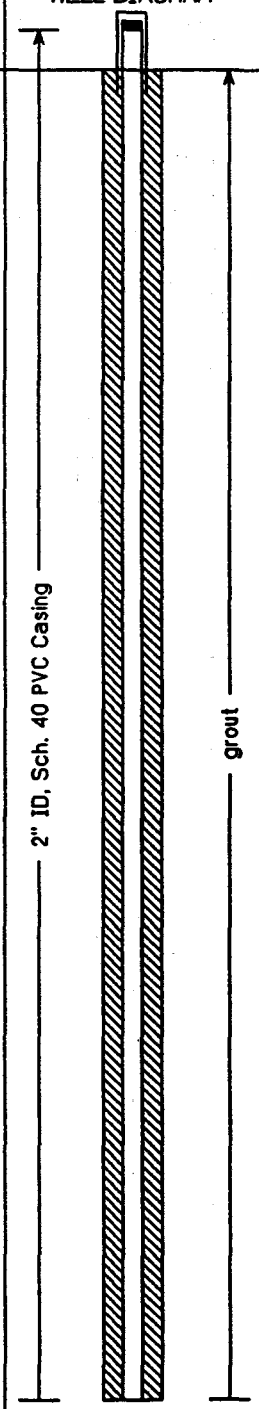
EnSafe/Allen & Hoshall

Monitoring Well 021G03LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *292.23 feet msl*
Started at *1440 on 2-27-96*	TOC Elevation: *294.43 feet msl*
Completed at *1015 on 2-28-96*	Depth to Groundwater: *35.71 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.72 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *78 to 88 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0'-2.5') Soil, roots/grass, organic material, and gravel.	289.7
			1	83	BG		ML	(2.5'-13') Silt, clayey (see descriptions below). (2.5'-8') Clayey silt. Moderate yellowish-brown to moderate brown in color.	
5									
								(8'-11') Silt, clayey, light brown in color, mottled with dark yellowish-orange material below 9' and light olive gray material below 10'.	
10			2	110	BG			(11'-13') Silt, clayey, moderate yellowish-brown to light brown in color. Rare lignitic material, becomes sandy near 13'.	279.2
							SM	(13'-15.5') Silty sand, fine-grained, moderate yellowish-brown to light brown in color. Wet, marked decrease in silt content from 14' to 15.5'.	276.7
15									
								(15.5'-25.5') Silty sand and sandy silt (see descriptions below). (15.5'-16') Silty and clayey fine-grained sand. Light brown in color, mottled with light olive gray material.	
20			3	95	BG		SM SC	(16'-21') Sandy silt. Dark yellowish-orange in color, mottled with moderate reddish-brown material and iron concretions of the same color. Very hard. (21'-24') Silty sand, very fine-grained, dark yellowish-orange mottled with moderate reddish-brown and light gray material.	
25							SC	(24'-25.5') Sandy silt. Dark yellowish-orange in color, mottled with moderate reddish-brown, light gray, and some pale red material.	268.7
							ML	(25.5'-26.5') Sand. Dark yellowish-orange in color, mottled with light gray and pale red material. With clay at 26'.	265.7
30									

WELL DIAGRAM



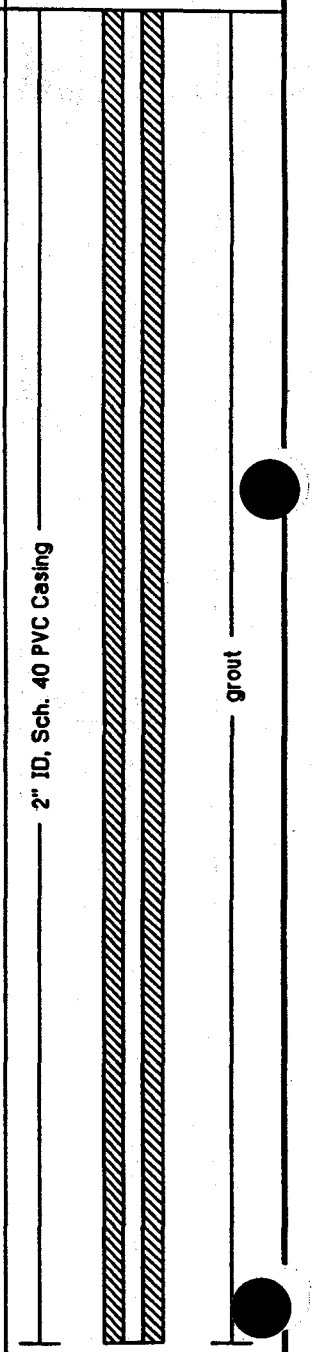
EnSafe/Allen & Hoshall

Monitoring Well 021G03LF

Project: *NSA Memphis*	Location: *Millington, TN SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *292.23 feet msl*
Started at *1440 on 2-27-96*	TOC Elevation: *294.43 feet msl*
Completed at *1015 on 2-28-96*	Depth to Groundwater: *35.71 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.72 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *78 to 88 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			4	90	BG		ML	(26.5'-34.5') Clayey and sandy silt. Dark yellowish-orange in color, mottled with light gray, moderate reddish-orange, and pale red material. Fluvial deposits contact estimated at 34'.	257.7
35							SP		254.7
40			5	100	BG		SP	(34.5'-87.5') Sand with clay seams and some gravel (see descriptions below). (34.5'-36') Fine-grained sand, dark yellowish-orange mottled with pale red and very light gray material. Clay seams present at 35' and 36' are pale red in color mottled with very light gray to yellowish-gray material.	
45								(36'-39') Fine-grained sand, yellowish-gray mottled with pale red material; clayey from 36' to 37.5', very wet from 37.5 to 38', wet below. Contains some lignitic material.	
50			6	80	BG			(39'-46') Sand, fine, mostly yellowish-gray in color with some patches of pinkish-gray material. Wet. (46'- 55') Sand, fine, yellowish-gray to very pale orange in color and mottled with some dark yellowish-orange material to 50'.	
55								Yellowish-gray clay seams at 48' and 53.5'. The clay seam at 53.5' contains some lignitic material. Rare gravel is present at 54'.	
60								(55'-56') Fine-grained sand, light olive gray in color.	

WELL DIAGRAM



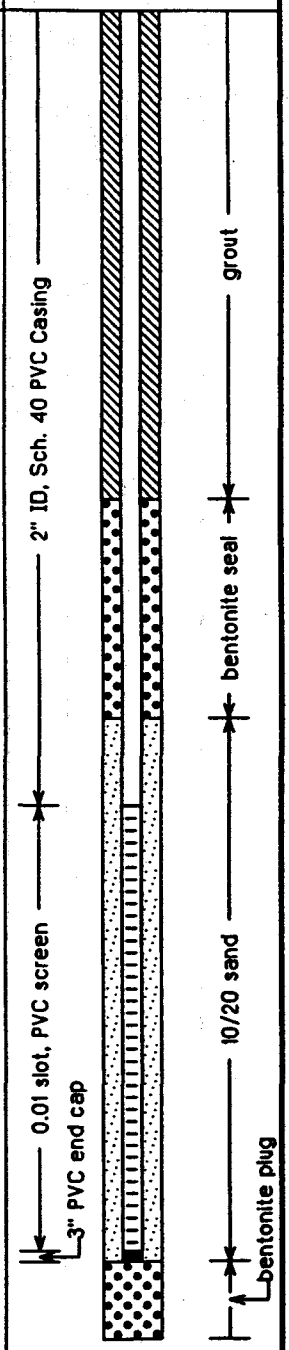
EnSafe/Allen & Hoshall

Monitoring Well 021G03LF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *292.23 feet msl*
Started at *1440 on 2-27-96*	TOC Elevation: *294.43 feet msl*
Completed at *1015 on 2-28-96*	Depth to Groundwater: *35.71 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.72 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *78 to 88 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			7	100	BG			(56'-66') Sand, fine, yellowish-gray to dark yellowish-orange, changing to mostly very pale orange below 62'. Sand is slightly micaceous with rare quartz and chert gravel, which decreases in content below 62'. Thin grayish-orange clay seams are present at 57' and 59', and thicker clay seams (3" to 4") are present at 63' and 66' with dark yellowish-orange material above and below the clay seams.	
65								(66'-76') Fine-grained sand, mostly very pale orange in color with very pale orange clay seams scattered throughout. 4" thick clay seams containing dark yellowish-orange material and iron-manganese nodules are present at 68', 71', and 75.5'.	
70			8	100	BG			Color changes from very pale orange to dark yellowish orange between 71' and 73', then becomes yellowish-gray from 73' to 76'. Lignitic material present. Rare gravel at 75'.	
							SP		
75									
80			9	75	BG			Fine-grained sand, very pale orange to grayish-orange, clayey and wet from 76' to 77', with 3" to 4" thick clay seams at 81' and 84'. Clay seams are very pale orange with dark yellowish-orange material. Contains gravel from 79' to 81', and composed mostly of very pale orange sand below 82'.	
85								Rare gravel at 85'.	
								(86'-87.5') Fine-grained, yellowish-gray sand with gravel (up to 1" in longest dimension), wet.	204.7
							SP GW	(87.5'-88.5') Sand and gravel, gravel is (up to 2" in longest dimension), dark yellowish-orange.	203.7
90							CL	(88.5'-96') Cockfield Formation: Clay with some sand seams.	

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 021G03LF
Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground Waste Tank)*
Project No.: *0094-08420*	Surface Elevation: *292.23 feet msl*
Started at *1440 on 2-27-96*	TOC Elevation: *294.43 feet msl*
Completed at *1015 on 2-28-96*	Depth to Groundwater: *35.71 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.72 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *96 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *78 to 88 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
95	X		10	120	BG		CL	Clay is dark yellowish-brown to dusky yellowish-brown in color; sand seams are very fine-grained and light olive gray color. The top 2" of clay is dark yellowish-orange, mottled with light brown and light olive gray material.		bentonite plug
								Soil boring terminated at 96'.	196.2	
100										
105										
110										
115										
120										

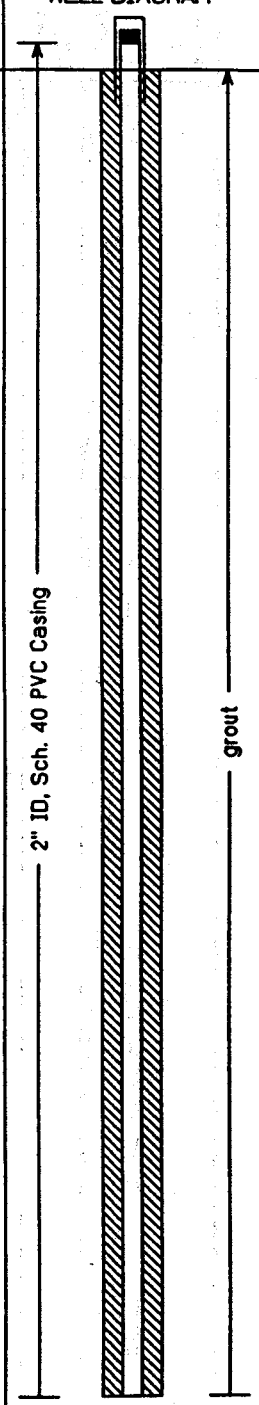
EnSafe/Allen & Hoshall

Monitoring Well 021G04UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground waste tank)*
Project No.: *0094-22133*	Surface Elevation: *293.66 feet msl*
Started at *1040 on 2-27-96*	TOC Elevation: *295.71 feet msl*
Completed at *1348 on 2-27-96*	Depth to Groundwater: *37.03 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.68 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *50.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100	BG		SW GW	(0'-6.5') Sand and gravel (backfill after underground waste tank was removed) is between 0' and 6.5'. Moderate yellowish-brown to dark yellowish-orange color.	
5								(6'-6.5') Gravel increases in size, and clay content increases.	287.2
							CL ML	(6.5'-14.5') Clay and silt, becoming sandy near bottom (see descriptions below).	
								(6.5'-10') Silty clay. Moderate brown to moderate yellowish- brown in color, mottled with dark yellowish-orange and dark yellowish-brown material.	
10			2	85	BG			(10.5'-14.5') Clayey silt, moderate brown to moderate yellowish- brown in color mottled with dark yellowish-orange and light olive gray material.	
								(12'-14.5') Sand content increase, along with an increasing amount of dark yellowish-brown material. Moist from 12' to 14'.	
									279.2
15							SC SM	(14.5'-18.5') Silty and clayey sand (see descriptions below).	
								(14.5'-16') Silty and clayey sand, very fine to fine-grained, moderate yellowish-brown to moderate brown color, very moist. Contains some lignitic material near 15'.	
								(16.5'-18.5') Becoming more clay-rich and moderate brown in color near 18.5'.	
									275.2
20							CL	(18.5'-25') Silty clay with some very fine sand. Moderate yellowish- brown in color, mottled with some dark yellowish-orange material.	

WELL DIAGRAM



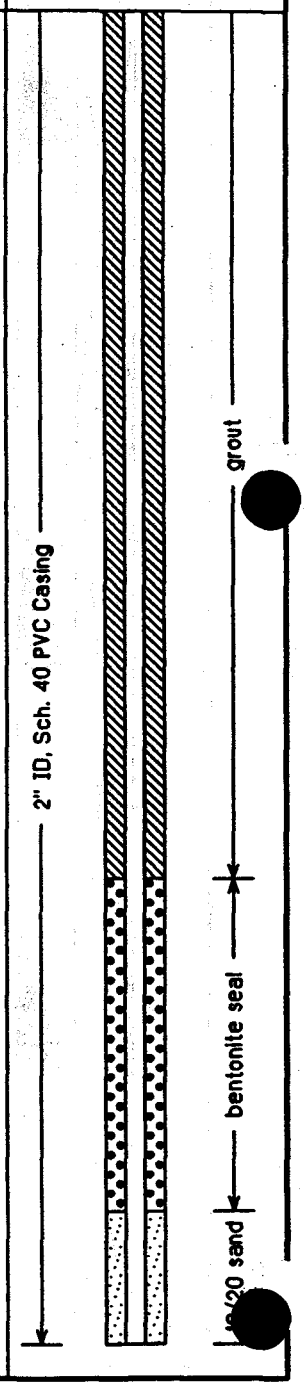
EnSafe/Allen & Hoshall

Monitoring Well 021G04UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground waste tank)*
Project No.: *0094-22133*	Surface Elevation: *293.66 feet msl*
Started at *1040 on 2-27-96*	TOC Elevation: *295.71 feet msl*
Completed at *1348 on 2-27-96*	Depth to Groundwater: *37.03 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.68 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *50.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			3	105	BG		CL	Below 21', the silt content increases, and the sample is very hard. Sample is mottled with moderate reddish-brown and light gray to light olive gray material. Slightly micaceous. Sand content increases near 25'.	
25							SC SM	(25'-26.5') Silty and clayey sand, very fine to fine-grained, moderate brown to dark yellowish-orange color mottled with dark yellowish- orange and light gray material.	268.7
							ML	(26.5'-27.5') Sandy silt. Yellowish-gray and mottled with pale red and a small amount of dark yellowish-orange material, slightly micaceous. Reddish-brown iron concretions are present.	267.2
							SP	(27.5'-28.5') Sand, very fine to fine-grained, dark yellowish-orange color mottled with some pale red material, slightly micaceous.	266.2
30			4	121	BG		ML	(28.5'-34') Silt. Dark yellowish-orange to moderate yellowish- brown, mottled with very light gray and some dark yellowish-orange material, stiff. Some of the very light gray material is clayey.	265.2
35							ML	(34'-35.5') Silt with very fine sand, pale red mottled with dark yellowish-orange to moderate reddish-brown material. Slightly micaceous.	259.7
			5	94	BG		SP	Fluvial deposits contact estimated near 36'. (35.5'-40') Silty fine-grained sand. Clayey near 35.5', yellowish- gray color mottled with pale red and dark yellowish-orange material between 35.5' and 37'. Becomes wet and mostly yellowish-gray in color between 37' and 40'.	258.2
40									253.7

WELL DIAGRAM



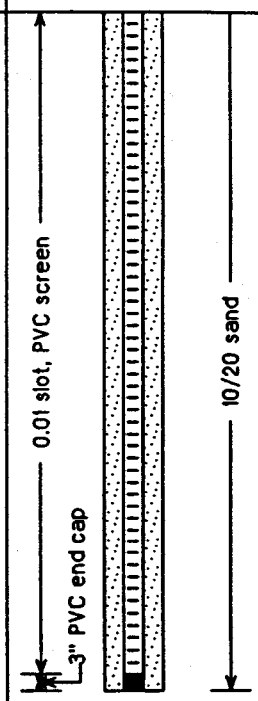
EnSafe/Allen & Hoshall

Monitoring Well 021G04UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU#21 (Underground waste tank)*
Project No.: *0094-22133*	Surface Elevation: *293.66 feet msl*
Started at *1040 on 2-27-96*	TOC Elevation: *295.71 feet msl*
Completed at *1348 on 2-27-96*	Depth to Groundwater: *37.03 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" core barrel inside 6" casing*	Groundwater Elevation: *258.68 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *50.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *40 to 50 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			6	0	BG			No sample description available; attempted to collect a Shelby tube sample between 40' and 43', but no sample was recovered.	253.7
			7	30	BG			No sample description available; collected a Shelby tube sample from 43' to 46'.	250.7
45									
			8	100	BG		SM/SC	(46'-50') Silty fine-grained sand, yellowish-gray, wet. Contains a 3.5" clay seam at 47.5' which is yellowish-gray in color, mottled with dark yellowish-orange to moderate yellowish-brown and very light gray with some pale red material. Mostly saturated.	247.7
50								Soil boring terminated at 50'.	243.7
55									
60									

WELL DIAGRAM



SWMU 39

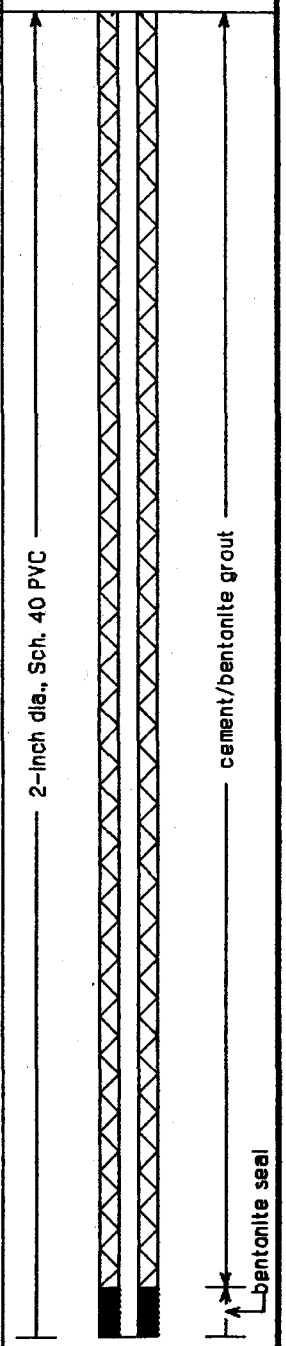
EnSafe (SM)
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G01LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *261.44 feet msl*
Started at *0930 on 03-23-99*	TOC Elevation: *261.13 feet msl*
Completed at *1700 on 03-23-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *78 feet*
Geologist: *G. Pierce*	Well Screen: *44 to 74 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface Conditions: Grass. 039G01LF is located in the grassy field, east of Building S-7, and Kittyhawk Avenue. Hand augered from ground surface to 5 feet bgs to clear for utilities.	
5			1						Loess. Clayey silt, brown, stiff.	
			2							
10								ML CL	Loess. Clayey silt, loose to soft, light brown.	
15										
20										239.4
			3					NR	No Recovery	238.4
25								ML CL	Loess. Clayey silt, more stiff, light brown with gray mottling.	
30										
35									Fluvial. Silty clay, loose, light brown, grading to silty fine sand, gray. Sand content increases the 31.5- to 36-foot section of core.	225.4
								SM	Fluvial. Fine sand with silt. Light orange-brown.	223.4
			4					SP SM	Fluvial. Sand with poorly sorted gravel. Some silt. Gravel ranges from less than 0.25- to 1-inch in diameter. Light orange-brown.	
40									Fluvial. Sand with poorly sorted gravel. Gray, grading back to light orange brown	

WELL DIAGRAM



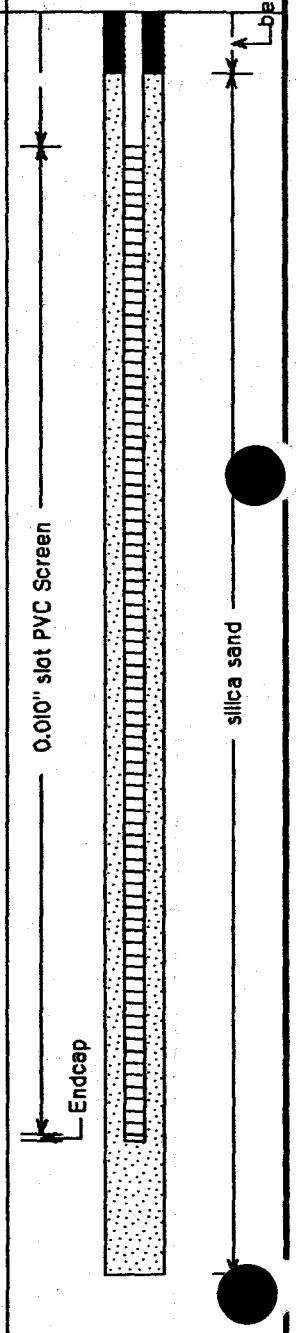
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G01LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *261.44 feet msl*
Started at *0930 on 03-23-99*	TOC Elevation: *261.13 feet msl*
Completed at *1700 on 03-23-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *78 feet*
Geologist: *G. Pierce*	Well Screen: *44 to 74 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45									Fluvial. Fine sand with trace gravel. Light orange-brown. Gravel increases with depth within the 44- to 48-foot length of core.	
			5						Fluvial. Fine sand and gravel. Gravel ranges from less than 0.25- to 2-inches in diameter. Varying amounts of sand and gravel throughtout. Light orange brown.	
50										
55								SP SM		
			6							
60										
65										
			7							
70										190.9
									Transition to Cockfield. Silt, firm/stiff, some very fine sand.	
								CL	Cockfield. Silty clay with some very fine grained sand. Dark gray.	
75										
			8						TD boring at 78 feet.	183.4
80										

WELL DIAGRAM



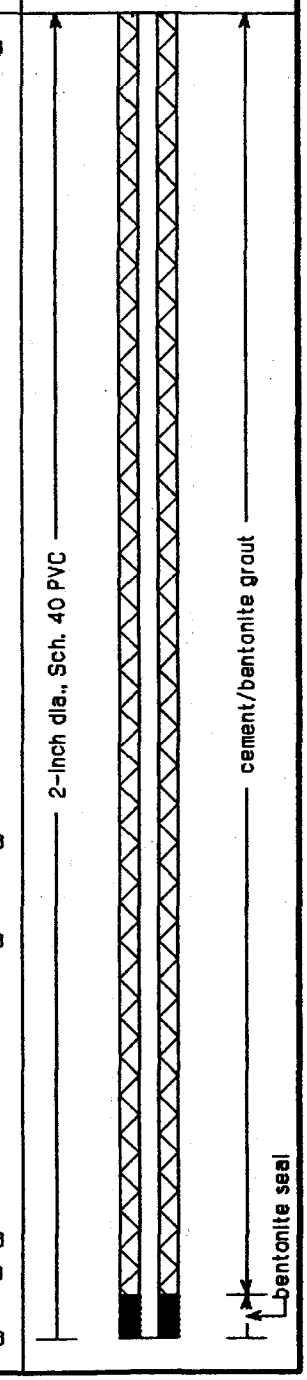
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G02LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.64 feet msl*
Started at *0930 on 03-24-99*	TOC Elevation: *263.47 feet msl*
Completed at *1815 on 03-24-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *108 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill	Surface Conditions: Asphalt. East side of Building S-203.	262.6
									Loess. Clayey silt, gray/brown	
5										
			1						Loess. Clayey silt, brown, soft.	
10								ML CL		
15									Loess. Clayey silt, gray.	
			2							
20										
			3						Increasing stiffness and lighter gray color with depth.	238.6
25								NR	No Recovery	
									Loess. Clayey silt, medium stiff, light gray and brown mottled.	235.6
30								ML CL		
35									Quickly grades to silt with sand from 37- to 38-feet bgs.	228.6
			4					NR	No revcovery	225.6
								SP SM	Fluvial. Silty fine sand, some small gravel (<0.25-inch), dark gray.	
40								ML CL		223.6

WELL DIAGRAM



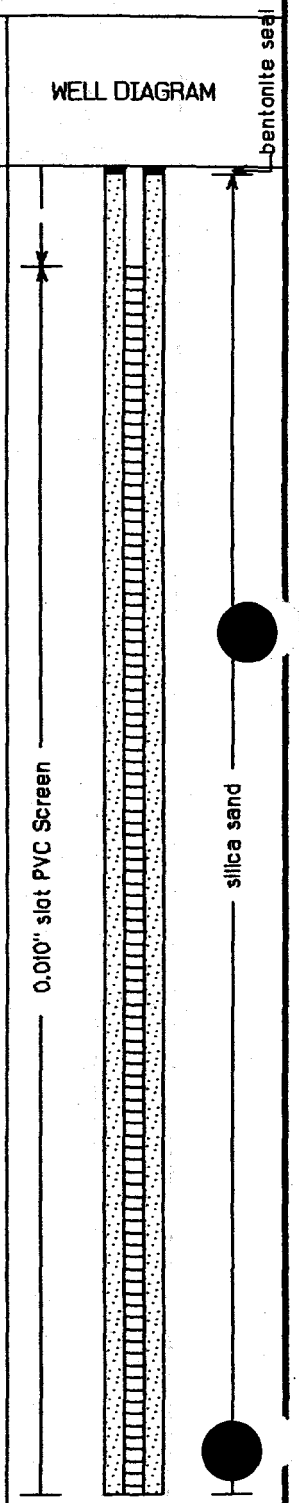
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G02LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-148*	Surface Elevation: *263.64 feet msl*
Started at *0930 on 03-24-99*	TOC Elevation: *263.47 feet msl*
Completed at *1815 on 03-24-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *108 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML CL	Fluvial. Silty clay with fine sand. Increasing sand and gravel with depth in the 40- to 44-foot section of core.	223.6
45			5					SP SM	Fluvial. Sand and gravel with silt. Poorly sorted, very fine to medium grained, gravel up to 2 inches in diameter. Light gray.	219.6
50										
55									Fluvial. Sand and gravel with silt, sand coarsens and gravel larger with depth. Color grades to brown.	205.6
			6					NR	No Recovery	204.6
60								SP SM	Fluvial. Sand and gravel, poorly sorted. Gravel from 0.25- to 2.5-inch diameter. Brown grading to orange-brown at 65 feet.	
65			7							
70									Increasing silt	190.6
75								SM	Fluvial. Silty fine sand grades from light brown to light gray. Grain size decreases with depth. OUT OF GRAVEL AT 74 FEET	
80			8						Color change to light orange-brown.	

WELL DIAGRAM



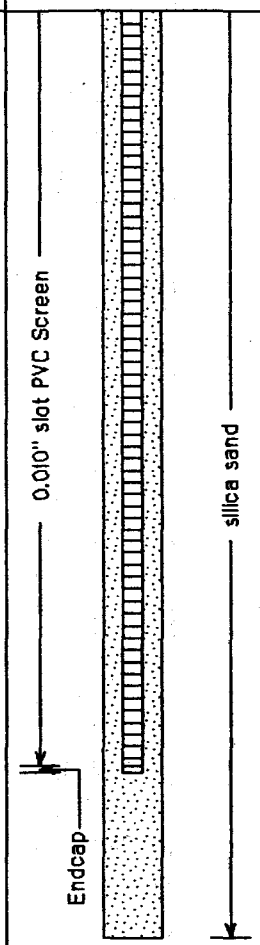
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G02LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.64 feet msl*
Started at *0930 on 03-24-99*	TOC Elevation: *263.47 feet msl*
Completed at *1815 on 03-24-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *108 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85										
			9					SM		
90										
95										
										165.6
								NR	No Recovery	
100			10							163.6
								SM	Fluvial. Silty fine sand, light orange-brown.	
										161.6
								CL	Cockfield. Clayey silt, very stiff, very dense, dark gray to black.	
105										
			11						TD Borehole at 108 feet bgs.	155.6
110										
115										
120										

WELL DIAGRAM



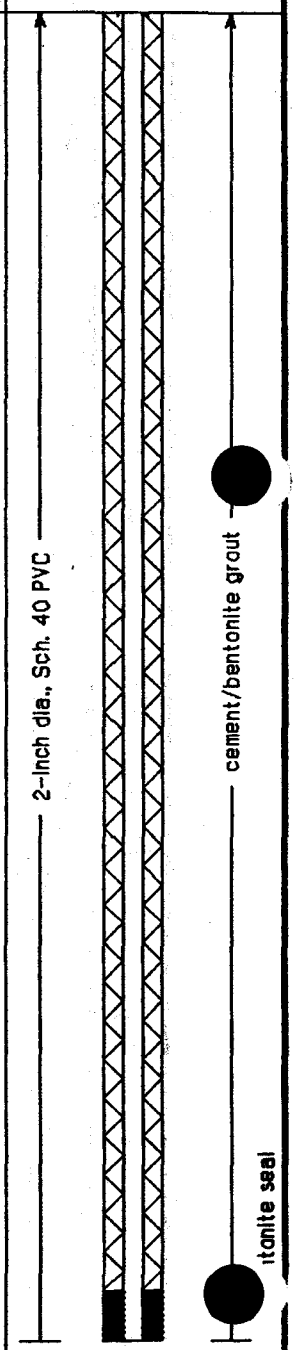
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G03LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.74 feet msl*
Started at *0945 on 03-23-99*	TOC Elevation: *262.33 feet msl*
Completed at *1755 on 03-23-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *108 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface Conditions: Grass. 039G03LF is located in the grassy field, east of Building S-1470, and south of Intrepid Avenue.	
5									Hand augered from ground surface to 5 feet bgs to clear for utilities.	
			1	100					Loess. Clayey silt, brown, medium stiff	
10										
									Gray mottling at 13 feet	
15								ML CL	Grades to gray at 18 feet.	
			2	100						
20										
									Grades to increased silt at 24 feet.	
25									Gray and brown mottled.	
			3	100					Grades to orange-brown.	
30										
									Loess grading to fluvial. Sandy silt, increasing sand with depth in the 32- to 36 foot section of core. Orange-brown.	230.7
35								SP SM	Fluvial. Silty sand with gravel.	
			4	100					Fluvial. Silty clay/clayey silt with sand and gravel. Gravel ranges in size from 0.25- to 0.75-inch.	
40										

WELL DIAGRAM



Increased sand content.

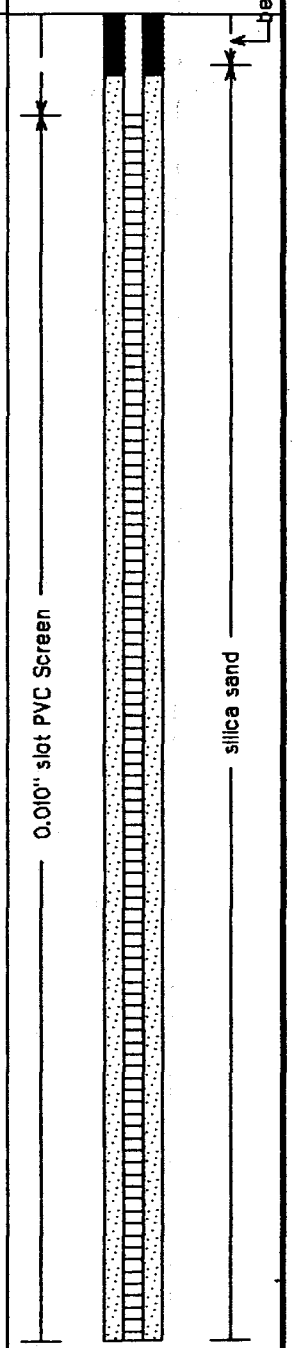
EnSafe (SM)
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G03LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.74 feet msl*
Started at *0945 on 03-23-99*	TOC Elevation: *262.33 feet msl*
Completed at *1755 on 03-23-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *108 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
45			5	100					Fluvial. Poorly sorted fine to coarse silty sand with gravel. Gravel up to 2 inches in diameter. Light gray.	
50										
55								SP SM	Fluvial. Sand with gravel, poorly sorted medium to coarse grained. Gravel from less than 0.25- to 1.5-inches in diameter. Light brown grading to light orange brown.	
60			6	100						
65										
70			7	100						
75								GP GM	Fluvial. Gravel, poorly sorted with sand. Light orange-brown.	189.7 / 187.7
			8	80				SM	Fluvial. Sand, very fine grained with silt. OUT OF GRAVEL 74 FEET	
80										

WELL DIAGRAM



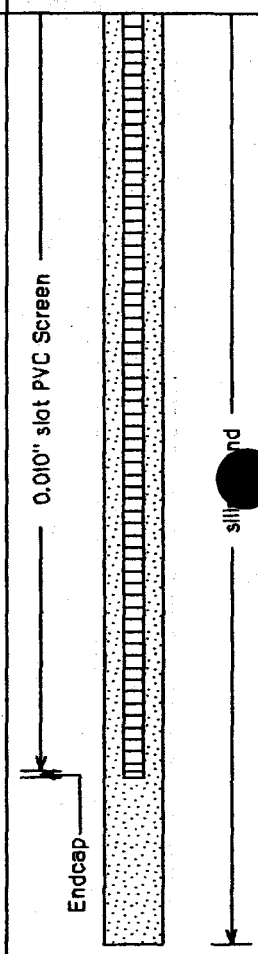
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G03LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.74 feet msl*
Started at *0945 on 03-23-99*	TOC Elevation: *262.33 feet msl*
Completed at *1755 on 03-23-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *108 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Light orange brown, grading to gray at 80 feet then back to light orange brown at 82 feet.	
85			9	100				SM		
90										
95			10	100						
100									Cockfield. Clay, silty and sandy, very fine grained sand. Dense, very stiff. Dark gray to black.	162.7
105								CL		
			11	100					TD boring at 108 feet bgs.	154.7
110										
115										
120										

WELL DIAGRAM



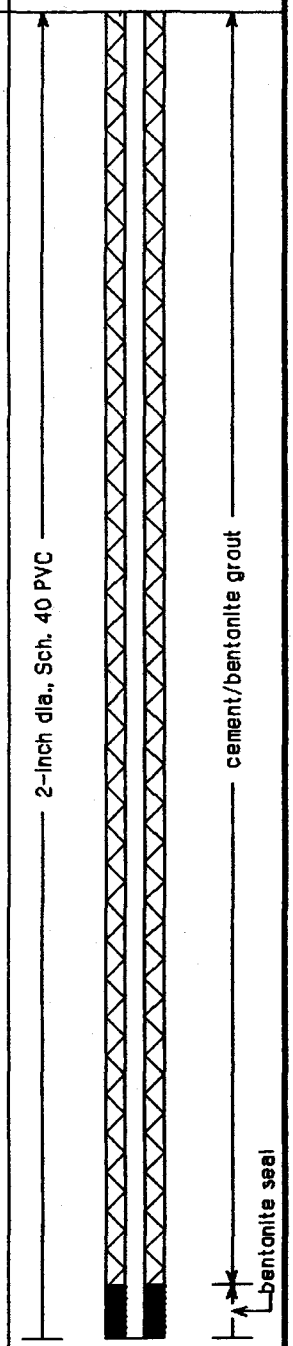
EnSafe (SM)
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G04LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.40 feet msl*
Started at *1030 on 03-26-99*	TOC Elevation: *263.17 feet msl*
Completed at *1755 on 03-26-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *103 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML CL	Surface Conditions: Grass. 039G04LF is located in the grassy field, at the southeast corner of Building S-203.	
									Loess. Clayey silt, brown, medium stiff	259.4
5								NR	No Recovery	
			1	50						255.4
10									Loess. Clayey silt, light brown.	
15									Grades to dark gray at 15 feet.	
20			2	100						
25								ML CL		
			3	100					Loess. Clayey silt with some very fine grained sand.	
30										
35									Gray mottling at 36 feet.	
			4	100						
40										

WELL DIAGRAM



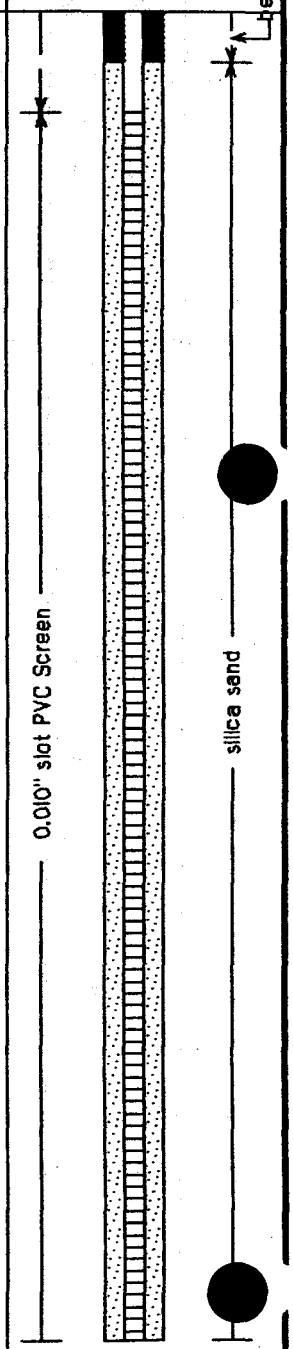
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G04LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-148*	Surface Elevation: *263.40 feet msl*
Started at *1030 on 03-26-99*	TOC Elevation: *263.17 feet msl*
Completed at *1755 on 03-26-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *103 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML CL	Fluvial. Silty sand with gravel. Fine to medium sand. Dark gray.	221.9
45			5	100					Fluvial. Silty sand with gravel. Gravel poorly sorted, ranges in size from 0.25 to 2.0 inches in diameter. Light brownish gray.	
50									Fluvial. Sand with gravel. Sand fine grained with silt, poorly sorted. Gravel less than 0.25-inch.	
55									Fluvial. Silty sand with gravel. Gravel poorly sorted ranging in size from 0.25 to 2 inches in diameter. Light brownish gray.	
60			6	100				SP SM	Fluvial. Silty sand with gravel. Poorly sorted medium to coarse sand.	
65									Color change to orange brown.	
70			7	100						
75										187.9
80			8	100				SM	Fluvial. Silty sand, very fine grained. Orange brown to 76.5, changes to light gray. OUT OF GRAVEL AT 75.5 FEET	

WELL DIAGRAM



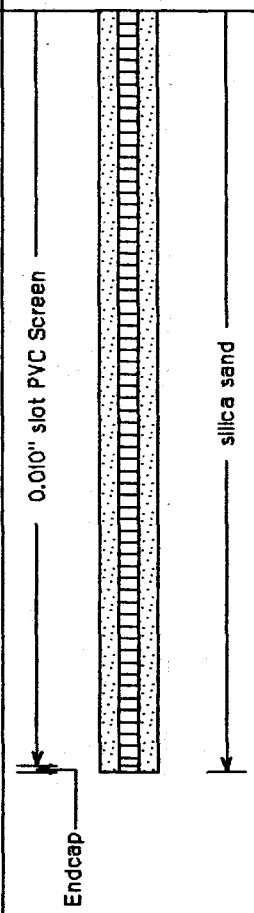
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G04LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.40 feet msl*
Started at *1030 on 03-26-99*	TOC Elevation: *263.17 feet msl*
Completed at *1755 on 03-26-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *103 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 103 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85			9	100						
90								SM		
95			10	100						
100										162.4
			11	100				CL	Cockfield. Clay, silty and sandy, very fine grained sand. Dense, very stiff. Dark gray to black.	160.4
105									TD boring at 103 feet bgs.	
110										
115										
120										

WELL DIAGRAM



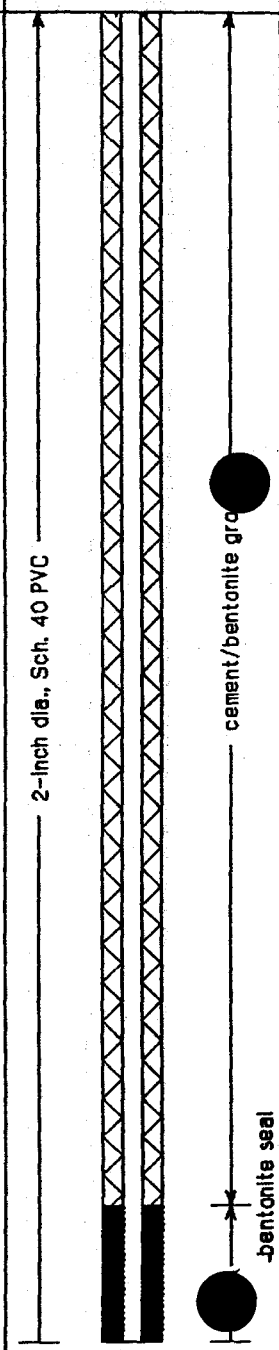
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G05LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.70 feet msl*
Started at *0930 on 03-27-99*	TOC Elevation: *262.43 feet msl*
Completed at *1715 on 03-27-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface Conditions: Grass. 039G05LF is located in the grassy area south of the Building S-74 slab.	
5									Loess. Clayey silt, brown	
10									Brown and gray mottled.	
15									Gray.	
20			1	100				ML CL		
25			2	100						
30			3	100						
35									Collected Shelby tube from 33 to 35 feet bgs.	
									Loess. Clayey silt with some very fine grained sand. Gray with brown mottling. Greenish gray from 37 to 38. No odor.	
40								SP SM	Loess grading to Fluvial. Silt with clay and very fine grained sand. Dark gray.	222.7

WELL DIAGRAM



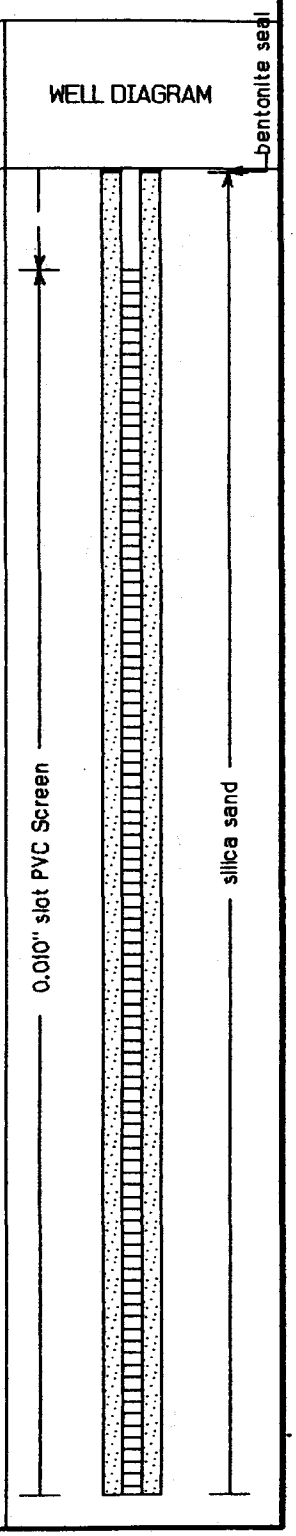
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G05LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.70 feet msl*
Started at *0930 on 03-27-99*	TOC Elevation: *262.43 feet msl*
Completed at *1715 on 03-27-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Fluvial. Silty sand, medium to coarse grained with small gravel. Dark gray.	222.7
									Fluvial. Sand and gravel, poorly sorted medium to coarse grained. Brown.	
45										
			4	100					Fluvial. Sand, very fine grained, with silt and trace gravel. Light gray.	
50									Fluvial. Sand, poorly sorted fine to medium grained with gravel. Gravel 0.25 to 1.5 inches in diameter. Light brown.	
55								SP SM		
			5	100						
60									Gray and brown from 60 to 65 feet.	
65									Light brown from 65 to 68.	
			6	100					Orange brown from 68 to 73.	
70										
75									Fluvial. Silty sand, very fine grained, gravel, some clay stringers. Orange brown, grades out of gravel at 74 feet.	188.7
								SM	Fluvial. Very fine silty sand OUT OF GRAVEL AT 74 FEET	
			7	100					Clay seam (0.5 to 1 inch thick) at 77.5 feet bgs.	
80									Light gray	

WELL DIAGRAM



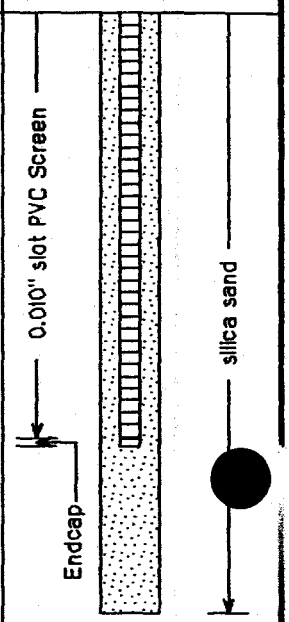
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G05LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.70 feet msl*
Started at *0930 on 03-27-99*	TOC Elevation: *262.43 feet msl*
Completed at *1715 on 03-27-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85			8	100				SM	Light brown Light gray Light brown	
90									Fluvial. Silty sand, very fine grained, with some clay stringers. Orange brown.	170.7
95			7	100				CL	Cockfield. Silty clay with some very fine grained sand. Very dark gray. Less silt with depth TD boring at 98 feet.	164.7
100										
105										
110										
115										
120										

WELL DIAGRAM

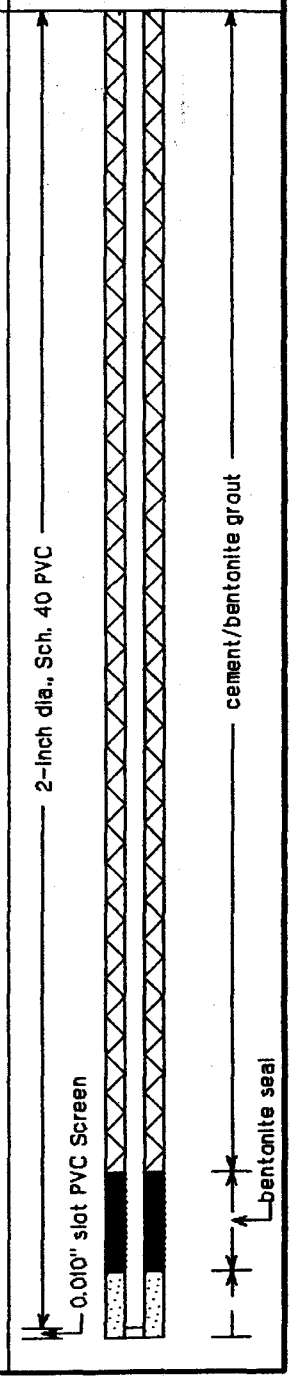


Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G06LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *261.25 feet msl*
Started at *0950 on 03-28-99*	TOC Elevation: *260.98 feet msl*
Completed at *1645 on 03-29-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *78 feet*
Geologist: *G. Pierce*	Well Screen: *40 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface Conditions: Grass. 039G06LF is in a grassy area along the western property boundary fence, just south of Intrepid Ave.	
5									Loess. Clayey silt, brown	
			1	100						
10										
15										
			2	100				ML CL	Brown and gray mottled.	
20									Grades to gray brown.	
25										
			3	100					Loess. Clayey silt, grades to sandy clayey silt. Sand is very fine grained. Light brown with some gray mottles.	
30										
			4	100						
35									Loess grading to Fluvial. Sand increases toward bottom of 38-foot core. Grades to gray.	
								SM	Fluvial. Silty sand, poorly sorted fine to coarse. Gray brown.	224.2
40								ML CL	Fluvial. Clayey silt, gray.	222.2



EnSafe (SM)

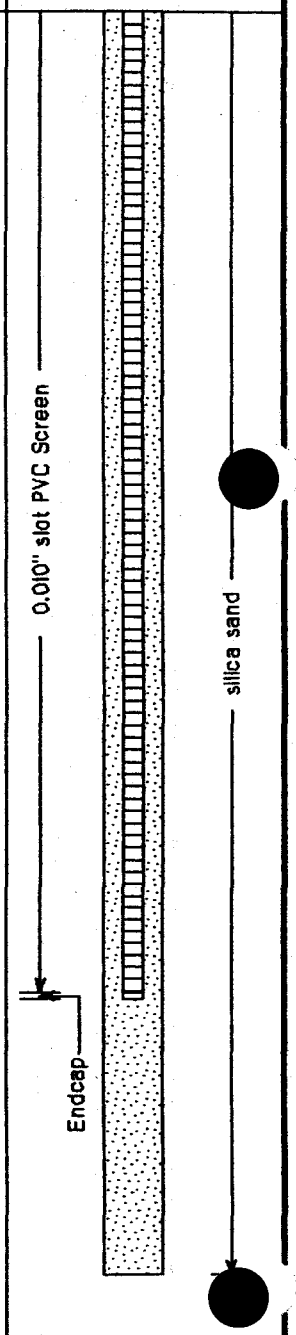
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G06LF

Project: *Assembly F - RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *261.25 feet msl*
Started at *0950 on 03-28-99*	TOC Elevation: *260.96 feet msl*
Completed at *1845 on 03-29-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *78 feet*
Geologist: *G. Pierce*	Well Screen: *40 to 70 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML CL	Fluvial. Sand, very fine grained, some small gravel. Orange-brown.	220.7
45								SP SM	Fluvial. Sandy gravel. Sand, fine to coarse, silty. Gravel ranges from 0.25- to 1.5-inch. Orange-brown.	
			5	100					Fluvial. Sand, fine grained. Orange-brown. OUT OF GRAVEL AT 47.5 FEET	213.7
50									Fluvial. Silty sand, very fine grained, with trace gravel. Orange- brown.	
55								SM		
			6	100						
60									Fluvial. Sand with some small gravel. Sand poorly sorted fine to coarse grained. Light brown.	
65								SP SM	Fluvial. Sandy gravel. Sand coarse with some fine. Light brown.	198.7 / 196.2
								SM	Fluvial. Sand, very fine grained with some gravel. Light brown.	194.2
			7	100				SP SM	Fluvial. Sand, very fine grained. No gravel. Light brown.	191.7
70									Fluvial. Gravelly sand. Sand is fine grained. Gravel up to 1.5 inches Light brown	
75								CL	Cockfield. Silty clay. Dark gray.	
			8	100					TD Boring at 78 feet bgs.	183.2
80										

WELL DIAGRAM



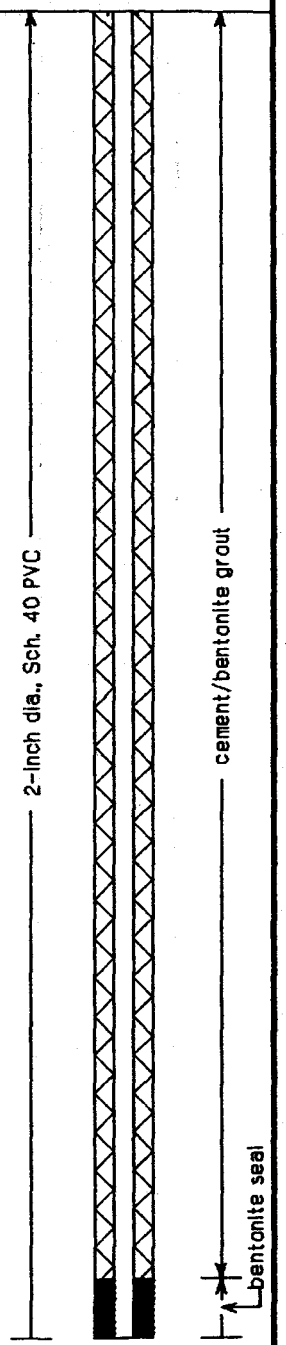
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G07LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.14 feet msl*
Started at *1015 on 03-30-99*	TOC Elevation: *262.79 feet msl*
Completed at *1845 on 03-30-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									Surface Conditions: Grass. 039G07LF is located in a grassy area east of the wester property boundary fence, west of Building S-75.	
5									Loess. Clayey silt, brown	
			1	100						
10										
15										
			2	60				ML CL	Brown and gray mottled grading to gray.	
20									Loess. Silty clay. Sticky. Gray	
25									Increased clay around 24 to 25.	
			3	90						
30									Loess. Clayey silt. Increasing silt with depth. Gray.	
35										
			4	100				SM	Loess grading to Fluvial. Clayey silt with fine grained sand. Trace gravel. Gray.	228.1
40										

WELL DIAGRAM



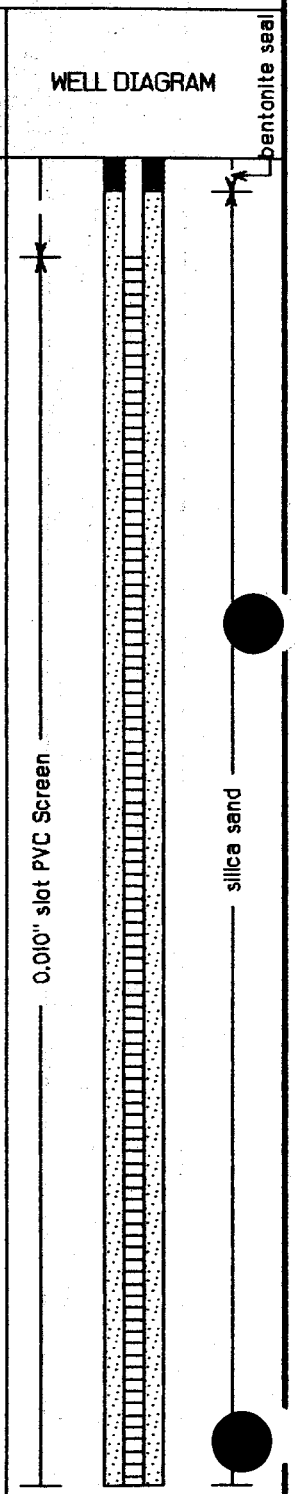
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G07LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.14 feet msl*
Started at *1015 on 03-30-99*	TOC Elevation: *262.79 feet msl*
Completed at *1845 on 03-30-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								SM	Fluvial. Silty sand, Medium grained. Orange brown.	222.1
									Fluvial. Silty sand, gravelly.	
45									Fluvial. Sand,medium grained,with silt, trace gravel. Orange brown.	
									Fluvial. Gravel with sand. Sand, fine to coarse. Orange brown.	
			5	100					Fluvial. Sand and gravel. Sand poorly sorted, fine to coarse. Gravel ranges from 0.25 to 1 inch in diameter.	
50										
55								SP SM		
			6	100					Smaller gravel 58 to 68.	
									One inch layer of fine grained silty sand. Gray.	
60										
65										
			7	100						
70										
								ML CL	Fluvial. Clayey silt. Orange brown, and gray mottled.	191.1 / 190.1
75								NR	No recovery. Lost core from 73 to 78 feet.	
			8	100						185.1
80								SM	Fluvial. Silty sand, very fine grained. Orange-brown. OUT OF GRAVEL AT 73 FEET?	

WELL DIAGRAM



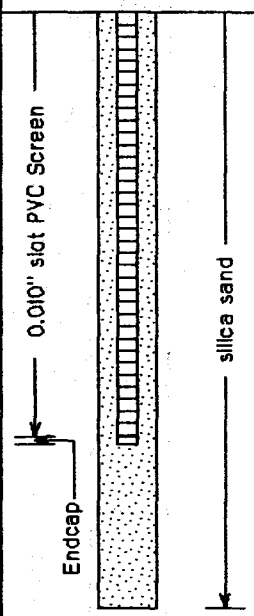
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G07LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.14 feet msl*
Started at *1015 on 03-30-99*	TOC Elevation: *262.79 feet msl*
Completed at *1845 on 03-30-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85								SM	Fluvial. Silty clay. Dark gray.	
			9	100					Fluvial. Silty sand, very fine grained. Dark gray.	
90									Fluvial. Silty sand, very fine grained. Orange-brown.	174.6
									Fluvial. Silty sand, very fine grained. Dark gray.	
95								CL	Cockfield. Silty clay. Medium gray.	
			10	100					TD Borehole at 98 feet.	165.1
100										
105										
110										
115										
120										

WELL DIAGRAM



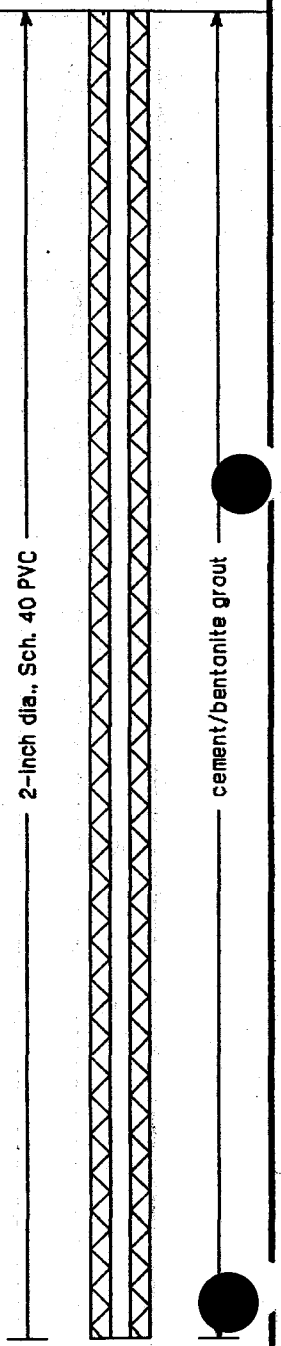
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G08LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.84 feet msl*
Started at *0900 on 04-06-99*	TOC Elevation: *262.40 feet msl*
Completed at *1640 on 04-06-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *45 to 95 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML CL	Surface Conditions: Asphalt. 039G08LF is located in the middle of the road that borders the western property boundary of the base.	259.8
5								NR	Loess. Clayey silt, gray No recovery from 3 to 8 feet.	
			1	38						254.8
10								ML CL	Loess. Clayey silt. Brown with some orange and gray mottling from 16 to 17 feet.	
15										245.8
			2	90				NR	No recovery.	244.8
20									Loess. Clay with silt. Dark gray.	
25										
			3	90				ML CL	Silt content increases with depth. Color grading to a light gray.	
30									Graded to silty clay. Light gray.	
35									Loess grading to Fluvial. Silty clay, grading into silty clay with very fine grained sand.	
			4	90						
40								SP		222.8

WELL DIAGRAM



EnSafe (SM)

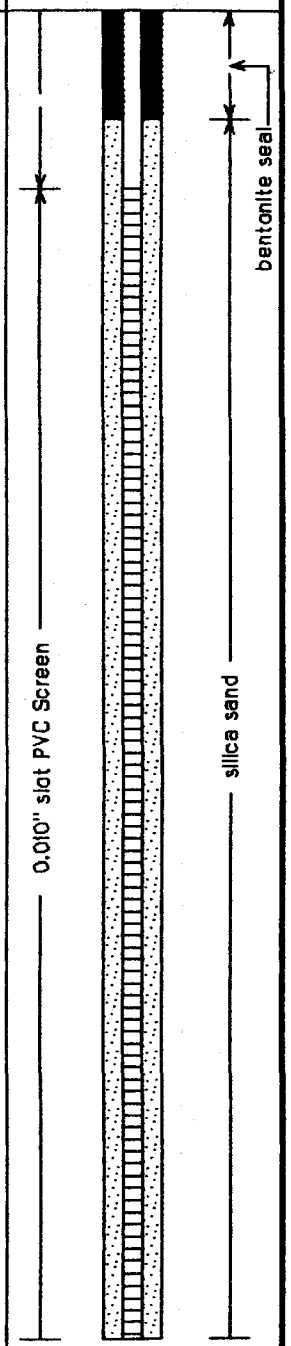
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G08LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *262.84 feet msl*
Started at *0900 on 04-06-99*	TOC Elevation: *262.40 feet msl*
Completed at *1640 on 04-06-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *45 to 95 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								SP	Fluvial. Sand, coarse grained. Gray.	222.8
								ML CL	Fluvial. Silty clay, with large gravel. Gray.	221.8
								SP SM	Fluvial. Sand and gravel. Sand coarse grained. Gray.	220.3
45									Fluvial. Sand and gravel. Sand, coarse grained. Last 0.5 feet sandy gravel (0.25- to 1.5-inch).	216.8
								NR	No recovery.	214.8
			5	80						
50								SP SM	Fluvial. Gravel and sand. Sand coarse grained. Gravel up to 2 inches in diameter. Orange-brown.	
									Fluvial. Gravelly sand. Less and smaller gravel than above. Sand is poorly sorted fine to coarse with silt. Light brown.	208.3
55								SM	Fluvial. Silty sand, poorly sorted, fine to coarse grained. Trace gravel. Orange brown.	
			6	100						204.8
60									Fluvial. Silty sand, poorly sorted, fine to coarse grained. No gravel. Orange-brown.	
									Fluvial. Sand, fine to very coarse grained. Gravel througout (less than 0.25- to 2-inch). Orange-brown.	
65								SP SM		
			7	100						
70										
75										188.3
								SM	Fluvial. Silty sand, very fine grained. Light orange-brown with gray and red laminae. Trace clay stringers, light gray. OUT OF GRAVEL AT 75 FEET	
			8	100						
80										

WELL DIAGRAM



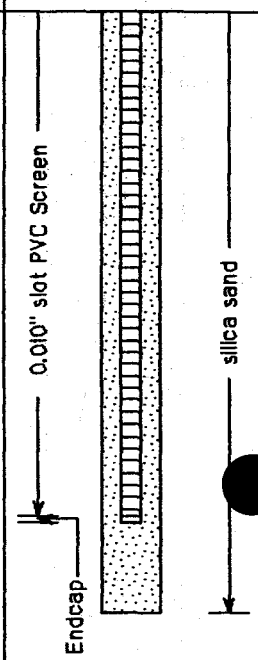
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G08LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-148*	Surface Elevation: *262.84 feet msl*
Started at *0900 on 04-06-99*	TOC Elevation: *262.40 feet msl*
Completed at *1640 on 04-06-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *45 to 95 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85								SM		
			9	100					Fluvial. Silty sand, very fine grained. Trace lignite. Dark gray to black.	
90										169.8
95								CL	Cockfield. Clay with silt, some lignite. Very stiff. Dark gray to black.	
			10	100					TD of borehole at 98 feet.	164.8
100										
105										
110										
115										
120										

WELL DIAGRAM



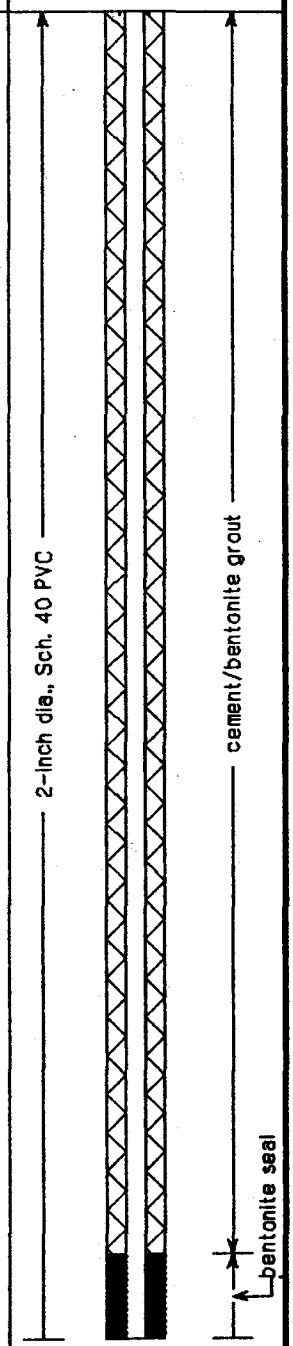
EnSafe (SM)
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G09LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-148*	Surface Elevation: *263.04 feet msl*
Started at *1336 on 04-07-99*	TOC Elevation: *262.85 feet msl*
Completed at *1900 on 04-07-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43.5 to 93.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML CL	Surface Conditions: Grass. 039G09LF is located near the eastern boundary of the City of Millington's park, just west of the Navy's property line.	
										260
5								NR	Loess. Clayey silt, Medium gray to light brown.	
									No recovery.	
			1	38						255
10									Loess. Clayey silt. Medium to light brown with gray and dark brown mottles.	
								ML CL	Loess. Silt. Gray with black inclusions (Fe).	
15										
										246
			2	90				NR	No recovery.	245
20									Loess. Silt. Gray with black inclusions and iron staining.	
									More mottling.	
25										
			3	100				ML CL		
30										
35									No mottling.	
			4	100				SP	Loess grading to Fluvial. Silt intermingled with find grained sand. Sand increases with depth. Gray.	225
40								ML CL	Fluvial. Sand, very fine to fine. Gray changing to light brownish gray at 38.5 feet.	223.5
									Fluvial. Sand and gravel. Sand fine to	

WELL DIAGRAM



EnSafe (SM)

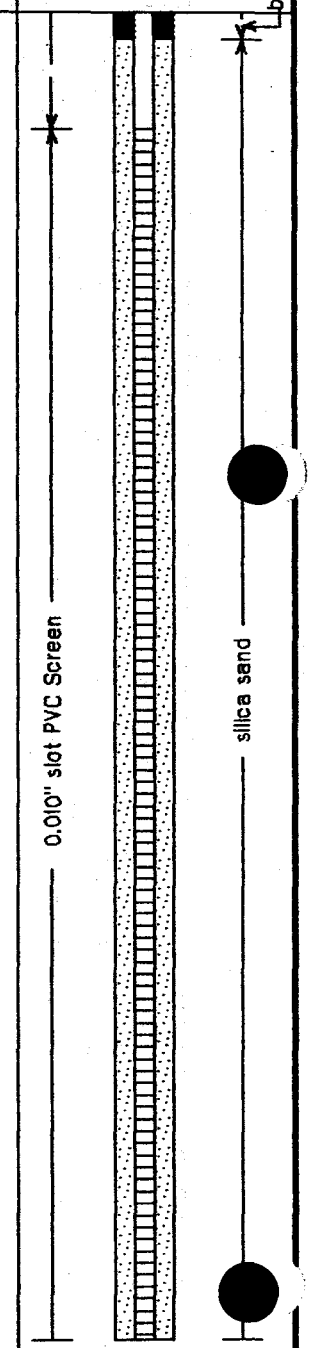
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G09LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.04 feet msl*
Started at *1338 on 04-07-99*	TOC Elevation: *262.85 feet msl*
Completed at *1900 on 04-07-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43.5 to 93.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								ML CL		
45								GW	Fluvial. Gravel. Well sorted, approximately 1.5-inch.	217 / 216
			5	100					Fluvial. Sand and gravel. Sand, coarse grained. Small gravel. Orange-brown.	
50									Fluvial. Sand and Gravel. Sand coarse grained. Gravel up to 2 inches in diameter. Light gray.	
55									Decreasing size and frequency of gravel from 52 to 55.5 feet.	
									Sparse gravel (0.5-inch diameter) from 55.5 to 58 feet.	
			6	100				SP SM		
60									Increasing size and frequency of gravel (up to 1-inch diameter) from 58 to 61.5 feet. Size and frequency consistent to 68 feet.	
65										
			7	100					Fluvial. Sand, poorly sorted fine to coarse. Some gravel. Orange- brown.	
70										191
									Fluvial. Sandy silt. with lenses of clayey silt. Orange-brown and light gray to gray mottling.	
75								SM	OUT OF GRAVEL AT 72 FEET	
			8	100					Fluvial. Sand, very fine grained. Sandy clay lenses. Gray to medium dark gray. Some lignite layers up to 2 inches thick from 78 to 79.5 feet.	
80										

WELL DIAGRAM



Fluvial. Silty sand, very fine grained. Orange-brown and light gray mottled. Some clay stringers. Light gray.

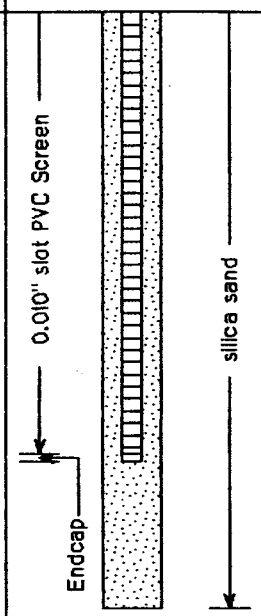
Environmental & Safety Designs, Inc.

Log of Monitoring Well 039G09LF

Project: *Assembly F – RFI*	Location: *NSA Mid-South, Millington, Tennessee*
Project No.: *CTO-146*	Surface Elevation: *263.04 feet msl*
Started at *1336 on 04-07-99*	TOC Elevation: *262.85 feet msl*
Completed at *1900 on 04-07-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance Environmental Inc.*	Total Depth: *98 feet*
Geologist: *G. Pierce*	Well Screen: *43.5 to 93.5 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	BLOWS/FT	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85								SM	Fluvial. Silty sand, very fine grained. Gray to dark gray. With 0.25 inch bands of clay. Very dark gray.	
			9	100						
90									Fluvial. Sand, very fine to fine. Orange-brown. 2- to 3-inch clay layer at 91.5 feet.	
									Cockfield. Clay with silt, some lignite. Very stiff. Dark gray to black.	170
95								CL		
			10	100					TD of borehole at 98 feet.	165
100										
105										
110										
115										
120										

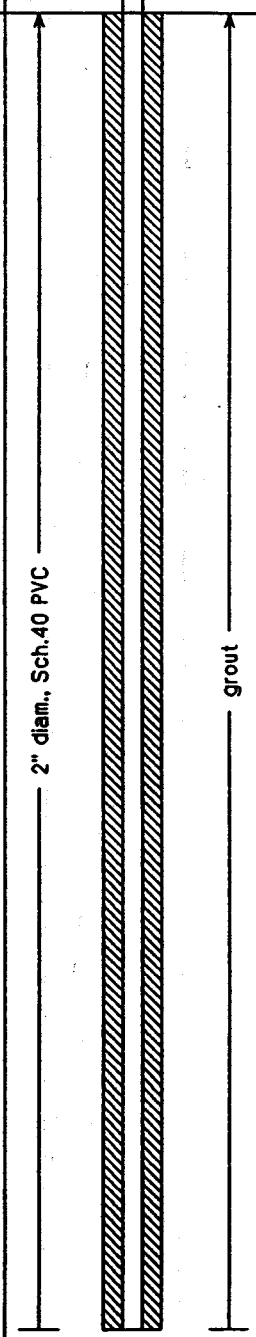
WELL DIAGRAM



SWMU 41

EnSafe/Allen & Hoshall	Monitoring Well 041G01DA
Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1144 on 4-8-99*	TOC Elevation: *feet msl*
Completed at *1615 on 4-8-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46 to 86 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								Loess consisting of brown to orange brown and greenish-gray silt and clayey silt, moist. Some gravel 0 to 1.5'.		
5										
			1	25						
10								Lignitic specs from 0 to 17'		
							ML			
15								Intermittant tree matter from 13 to 17'.		
			2	100						
20										
25										



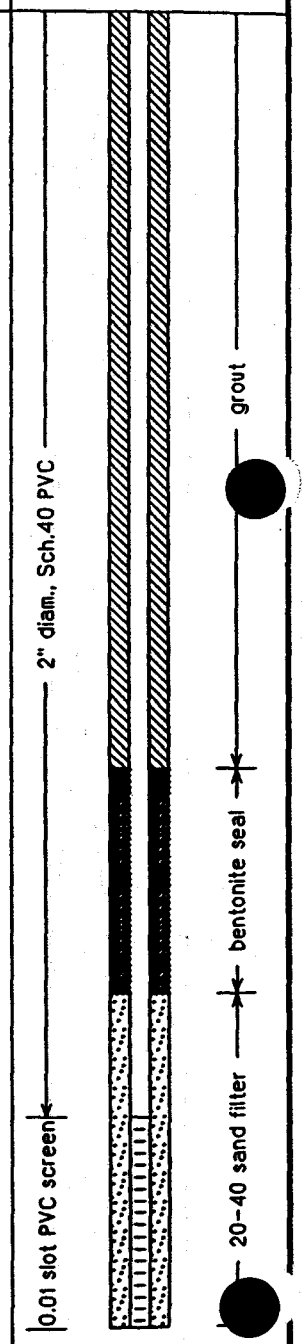
EnSafe/Allen & Hoshall

Monitoring Well 041G01DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1144 on 4-8-99*	TOC Elevation: *feet msl*
Completed at *1615 on 4-8-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46 to 86 feet*

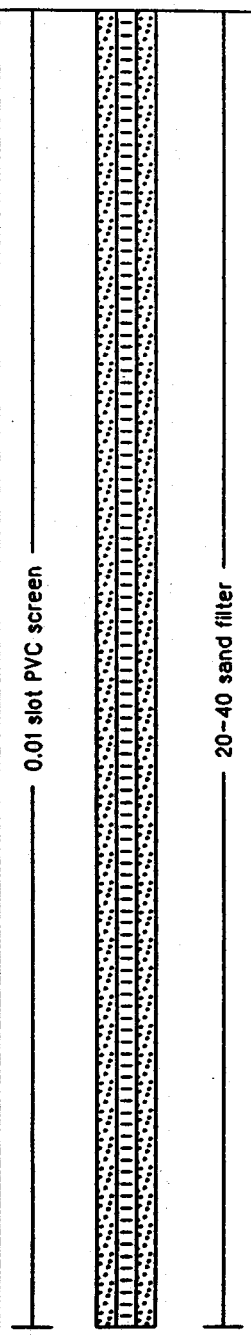
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			3	90			ML	Lignitic specs from 25 to 27'.	
30									
35			4	90					
40							ML	Gray, clayey silt to very fine sandy silt, moist. Base of Loess.	
							SW	Very fine to coarse silty sand with half-inch gravel. Top of Alluvium.	
							CL	6" Gravelly clay layer.	
45							SW	Lt. brownish-gray, very fine to fine sand with half-inch gravel. Coarsens to very fine to coarse sand.	
			5	100			ML	Lt. brownish-gray, fine sandy silt.	
50							SP	Lt. Gray, fine to coarse sand.	

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 041G01DA
Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1144 on 4-8-99*	TOC Elevation: *feet msl*
Completed at *1615 on 4-8-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46 to 86 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SP			
								Lt. gray to lt. brownish-gray, very fine to coarse sand, with some gravel to 58'.		
55										
			6	100						
								Lt. gray, medium to very coarse sand, with some gravel to 68'.		
60							SW			
65										
			7	100						
								Lt. gray, fine to very coarse sand, with some gravel to 70'.		
70										
								Lt. gray, fine sand with lignite from 74 to 75'. No gravel.		
							SP			
75							OL			



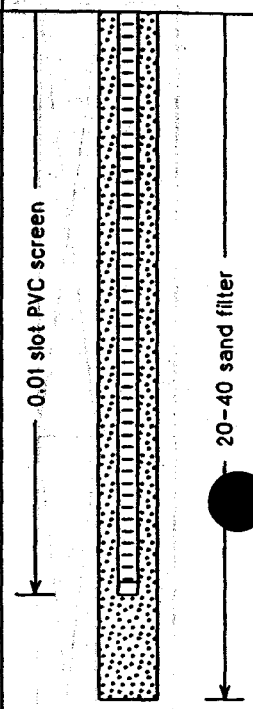
EnSafe/Allen & Hoshall

Monitoring Well 041G01DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1144 on 4-8-99*	TOC Elevation: *feet msl*
Completed at *1615 on 4-8-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46 to 86 feet*

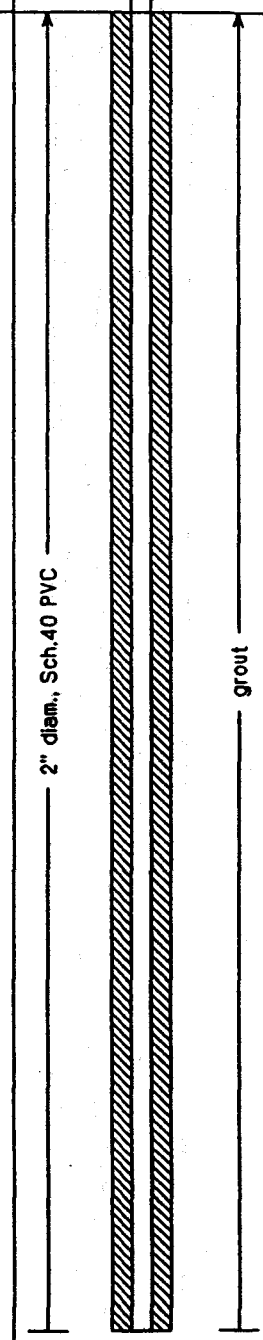
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	Black-brown, lignitic clay layer, moist to dry.	
							CL	Dk. olive-brown clay, moist.	
			8	100			SW	Gray to dk. gray, very fine to fine sand, moist.	
80							SC	Olive-gray, fine sand with some silt and clay, moist. Base of Alluvium.	
85							CL	Olive-gray clay mottled with lignite specs. Top of Cockfield.	
			9	100				***End of boring @ 88' bgs.***	
90									
95									
100									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 041G02DA
Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0839 on 4-9-99*	TOC Elevation: *feet msl*
Completed at *1202 on 4-9-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46.3 to 81.3 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								Loess consisting of brown to orange brown and greenish-gray silt and clayey silt, moist. Sporadic iron staining. Some gravel .5 to 1'. Lignitic specs from 1 to 3'.		
5										
			1	50						
10										
							ML			
15								No recovery 12 to 18'.		
			2	60						
20										
25										



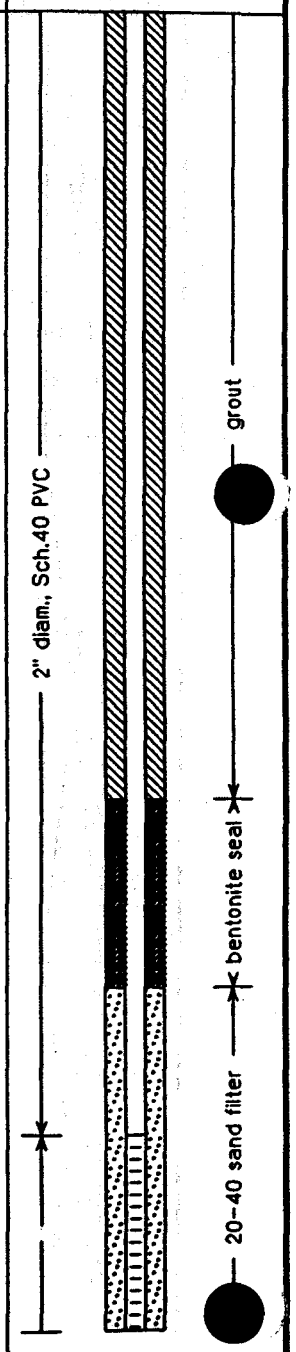
EnSafe/Allen & Hoshall

Monitoring Well 041G02DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0839 on 4-9-99*	TOC Elevation: *feet msl*
Completed at *1202 on 4-9-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46.3 to 81.3 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X		3	90			ML	No recovery 27 to 28'.	
30									
							ML	Lt. olive brownish gray, fine sandy silt, moist.	
35							SP	Lt. olive brownish gray, silty fine sand, moist.	
							SW	Lt brownish gray medium to coarse sand, moist to wet. Grades to medium to very coarse sand.	
			4	90			ML	Lt. olive gray, slightly clayey silt. Base of Loess.	
40							SW	Lt. brownish gray, medium to very coarse sand with gravel. About 2/3 sand and 1/3 gravel. Top of Alluvium.	
							ML	Brownish gray, slightly sandy (very fine) silt. 2.5" silty gravel zone in center.	
							SW	Brownish gray, medium to very coarse sand with gravel. Gravel content increases with depth.	
45							GW	Gravel (1/8 to 1 1/2") with medium to very coarse sand.	
							SW	Orange brown grading to pale yellow gray, medium to very coarse sand to 48.5'.	
	X		5	100				Lt. gray, fine to medium sand to 53'.	
50									

WELL DIAGRAM



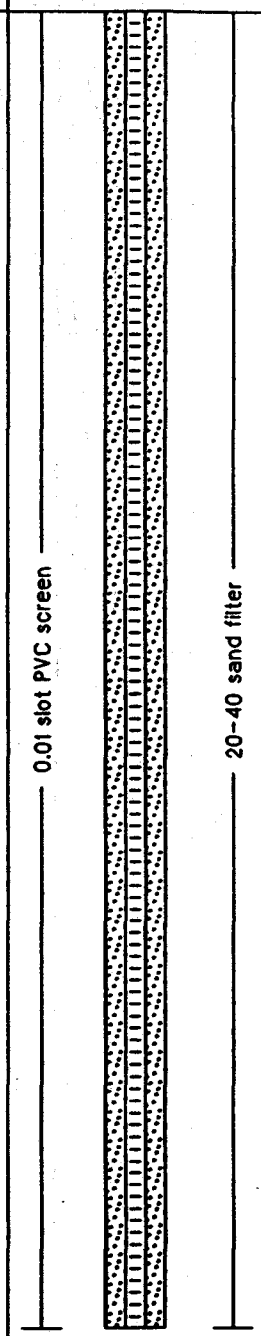
EnSafe/Allen & Hoshall

Monitoring Well 041G02DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0839 on 4-9-99*	TOC Elevation: *feet msl*
Completed at *1202 on 4-9-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46.3 to 81.3 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
55							SW	Yellowish gray and orange brown, medium to coarse sand, with gravel intermittantly, to 65'.	
			6	100					
60									
65								Orange brown, fine to medium sand, with some lenses of yellowish fine to medium sand.	
			7	100					
70							SP	Lt. gray grading to orange brown, medium sand, with some small lignite patches.	
							OL	Lignite with some very dark brown, very dense, clayey silt. Clayey silt content increases with depth. More silt than lignite at depth.	
							OL ML		
							CL SC	Gray to olive gray, fine sandy clay to clayey sand. Some minor lignite patches.	
75							CL SP		

WELL DIAGRAM



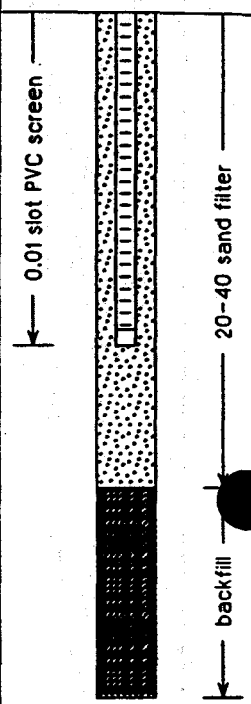
EnSafe/Allen & Hoshall

Monitoring Well 041G02DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0839 on 4-9-99*	TOC Elevation: *feet msl*
Completed at *1202 on 4-9-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *46.3 to 81.3 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							CL SP	Olive gray clay with lignitic bands. Intermittant olive gray sand layers 2 to 3" apart.	
			8	100			CL	Lt. olive gray clay with some lignitic banding.	
							SP	2" band of lt. olive gray very fine sand. Base of Alluvium.	
							CL	Olive gray, slightly silty clay. Top of Cockfield.	
80								Olive-gray to olive brown clay, wtih some lignitic specs.	
85							CL		
			9	100				***End of boring @ 88' bgs.***	
90									
95									
100									

WELL DIAGRAM



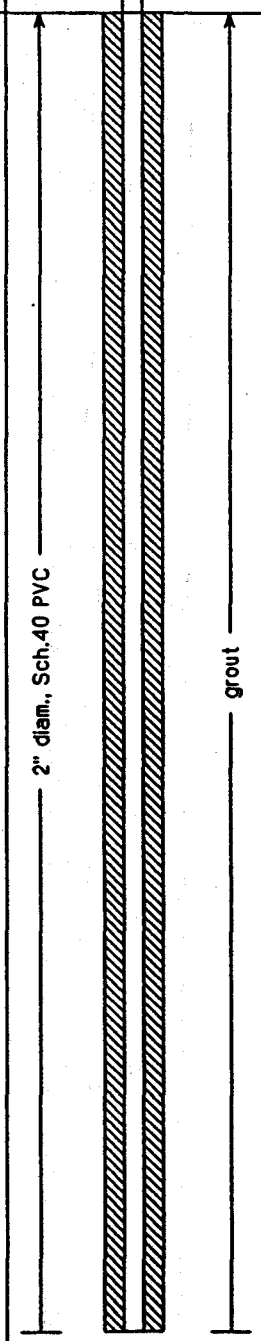
EnSafe/Allen & Hoshall

Monitoring Well 041G03DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0715 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *1001 on 4-11-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *83 feet*
Geologist: *Carol Davis*	Well Screen: *44 to 79 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Loess consisting of brown to orange brown and olive gray silt and clayey silt, moist.	
								No recovery 4 to 8'.	
5									
			1	50				Occasional iron staining and concretions 8.5 to 13'.	
10							ML		
								No recovery 13 to 18'.	
15									
			2	50				Shell fragments and iron concretions 18 to 24'.	
20									
25									

WELL DIAGRAM



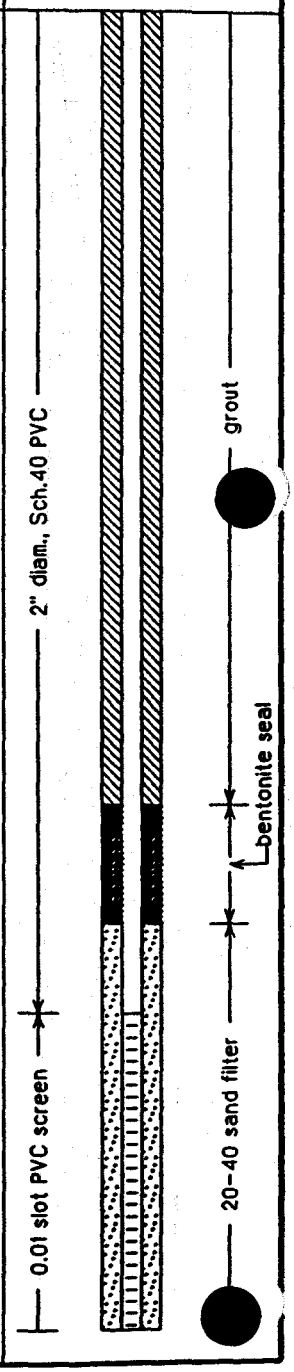
EnSafe/Allen & Hoshall

Monitoring Well 041G03DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0715 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *1001 on 4-11-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *83 feet*
Geologist: *Carol Davis*	Well Screen: *44 to 79 feet*

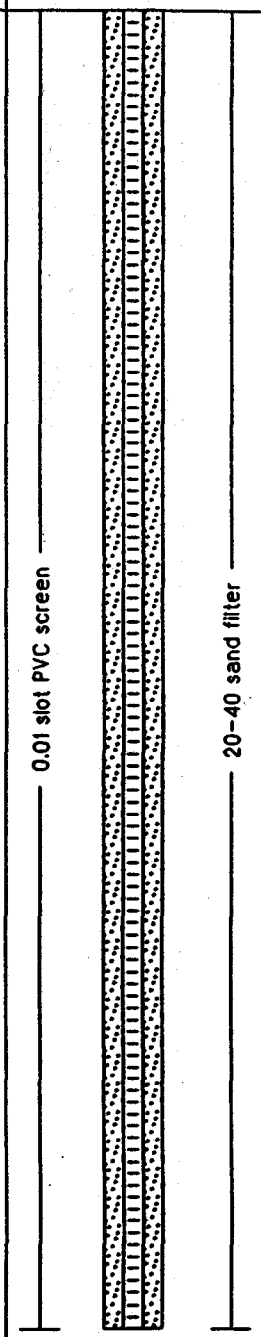
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			3	100			ML	Swanpy odor 28 to 36'.	
30									
35									
			4	90			ML	Olive brownish gray, silt, with minor amounts of very fine grading to fine, sand. 3" very sandy silt @ 37'. 1" sand layer at base, wet. Base of Loess.	
40							ML GM	Olive brownish gray, sandy silt and sandy silty gravel, wet. Top of Alluvium.	
							SW	Pale yellowish gray, medium to very coarse sand and fine to coarse gravel. 6" gravel layer @ 47'.	
45									
			5	100			SC	Lt. gray, clayey, very fine to fine sand.	
							SW	Lt. gray, fine to very coarse sand, with occassional gravel to 50'.	
50									

WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 041G03DA
Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0715 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *1001 on 4-11-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *83 feet*
Geologist: *Carol Davis*	Well Screen: *44 to 79 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								2" clay lense at 50'.		
55							SW	Pale yellowish gray, medium to very coarse sand, with gravel to 63.5'. Color changes to orangish brown at 59', and gravel gets larger, up t 3".		
			6	100						
60										
65							SP	Lt. gray to lt. orangish brown, fine sand. Sporadic lignitic bands present.		
			7	100						
70							ML	Very dark brown, clayey silt, with lots of lignitic lenses and tree fragments, dense.		
75							ML	Gray to dark brown, fine sandy silt. About 2/3 silt and 1/3 sand.		

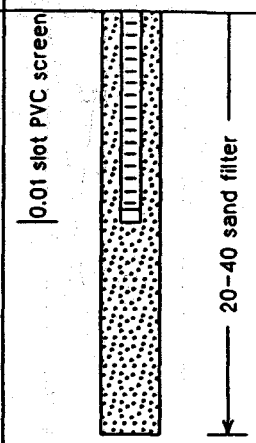


EnSafe/Allen & Hoshall

Monitoring Well 041G03DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *0715 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *1001 on 4-11-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *83 feet*
Geologist: *Carol Davis*	Well Screen: *44 to 79 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							ML			
							CL	Dk. grayish brown, silty clay, with minor very fine sand.		
							SC			
			8	100			CL	Dk. brown, silty, clayey fine sand. Base of Alluvium.		
80							CL	Olive brown to dk. olive gray, silty clay with lignitic banding. More like clayey silt in some places. Top of Cockfield.		
								Grayish olive brown, silty to very silty clay.		
			9	100				***End of boring @ 83' bgs.***		
85										
90										
95										
100										



EnSafe/Allen & Hoshall

Monitoring Well 041G04DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1515 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *0910 on 4-12-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *44.6 to 79.6 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								Loess consisting of brown to orange brown and olive gray silt and clayey silt, moist. Sporadic iron staining and concretions.		
5								No recovery 5 to 8'.		
			1	63						
10							ML			2" diam., Sch.40 PVC; grout
15								No recovery 16 to 18'.		
			2	80						
20										
25										

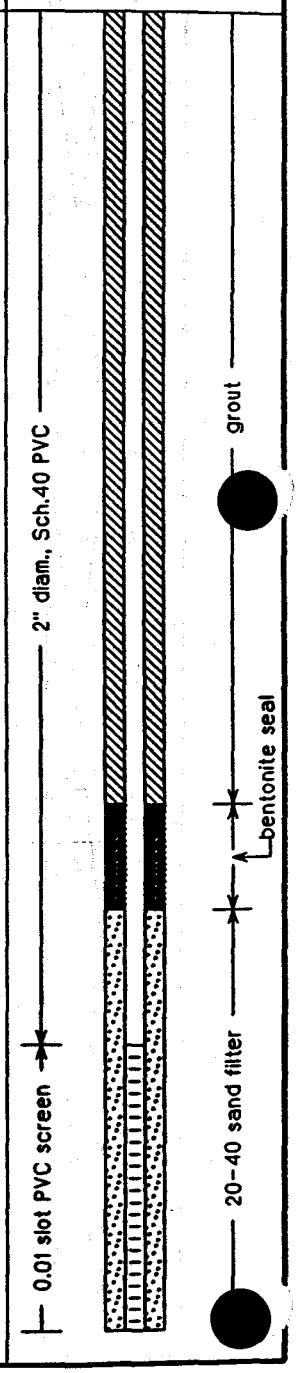
EnSafe/Allen & Hoshall

Monitoring Well 041G04DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1515 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *0910 on 4-12-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *44.6 to 79.6 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			3	100			ML		
30									
							ML	Lt. olive gray to olive gray, very fine to fine sandy silt. Sand content increases with depth. Very moist. Last 1" is mostly fine to medium sand. Base of Loess	
35									
			4	100			SW	Lt. brownish gray, fine to very coarse sand, with some very fine to fine gravel, wet. Top of Alluvium.	
40							ML	Lt. olive gray, silt.	
							SW/GW	Lt. brownish gray, grading to pale yellowish gray, medium to very coarse sand, with intermittant fine to medium gravel layers. Some coarse gravel.	
45									
			5	100			SP	Yellowish gray, medium sand. Color changes to pale yellowish gray with depth.	
50							SW		

WELL DIAGRAM



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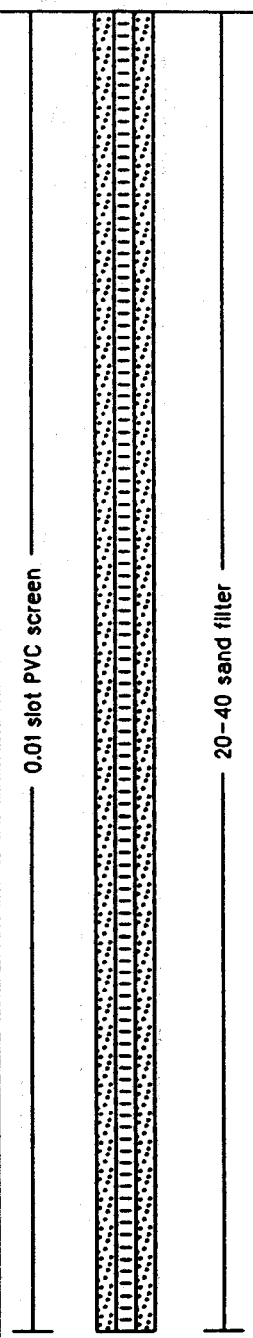
Monitoring Well 041G04DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1515 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *0910 on 4-12-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *44.6 to 79.6 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
55							SW	Lt. gray, medium to coarse sand with occassional fine gravel. Gravel increases last 1'.	
			6	100			SW/GW	Very coarse sand to fine gravel.	
60							SW	Very coarse sand, with some fine gravel.	
							GW	Brown, fine to medium gravel, with some medium sand.	
							SW	Yellowish brownish gray, fine to medium sand, with some fine gravel.	
65							SP	Lt. gray and yellowish gray fine sand.	
			7	100					
70							SP	Lt. to dk. gray, medium sand. Very lignitic, with dk. gray to very dk. gray, sandy, woody, lignitic layers.	
							ML	Very dark brown, clayey silt with lignitic streaks and specks.	
75							SC		

WELL DIAGRAM



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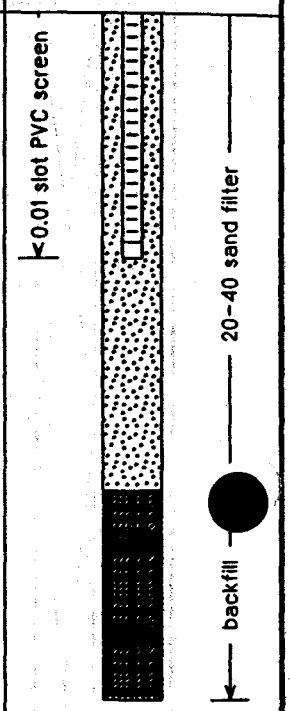
Monitoring Well 041G04DA

Project: *NSA-Midsouth SWMU 41*	Location: *NSA Mid-south, Millington, TN*
Project No.: *0146*	Surface Elevation: *feet msl*
Started at *1515 on 4-11-99*	TOC Elevation: *feet msl*
Completed at *0910 on 4-12-99*	Depth to Groundwater: *feet* Measured:
Drilling Method: *Rotasonic; 4" barrel through 6" casing*	Groundwater Elevation: *feet msl*
Drilling Company: *Alliance*	Total Depth: *88 feet*
Geologist: *Carol Davis*	Well Screen: *44.6 to 79.6 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SC	Olive gray, very fine to fine, very clayey sand. Base of Alluvium.	
			8	100			ML	Olive grayish brown, very clayey silt.	
80							CL	Olive grayish brown, clay, dense.	
85							ML	Very dk. brown, lignitic, clayey silt.	
			9	100			CL	Very dk., slightly reddish brown, silty clay, dense.	
90								***End of boring @ 88' bgs.***	
95									
100									

WELL DIAGRAM



SWMU 59

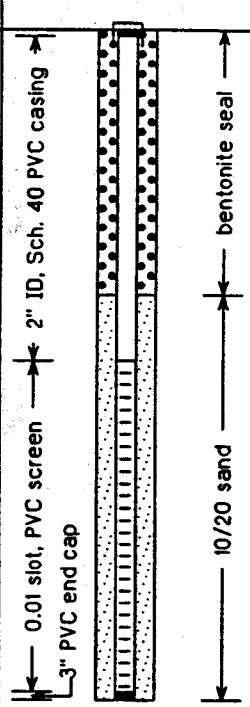
EnSafe/Allen & Hoshall

Monitoring Well 059G01LS

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #59 (Old Pesticide Shop)*
Project No.: *0106-08420*	Surface Elevation: *263.40 feet msl*
Started at *1000 on 3-4-96*	TOC Elevation: *263.24 feet msl*
Completed at *1046 on 3-4-96*	Depth to Groundwater: *7.55 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *255.69 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100			GW	(0-1') Asphalt and gravel fill.	262.4
			2	100			OL GW	(1-2') Soil and gravel fill.	261.4
			3	100			ML	(2-7') Clayey silt, olive gray in color, moist, with a trace of organic material.	
5					1.6				
			4	83	1.8		CL	(7-11') Silty clay, olive gray in color. Contains organic material. Iron-staining from 9' to 11'.	256.4
					2.4				
10					2.0		CL	(11-20') Clay, olive gray to light olive gray in color with dark yellowish-orange iron-staining. Contains abundant iron-manganese nodules.	252.4
					1.6				
15			5	120	1.6			Less dark yellowish-orange iron-staining from 16' to 17'.	
					1.8				
					2.0				
20								Terminated soil boring at 20'.	243.4
25									
30									
35									
40									

WELL DIAGRAM



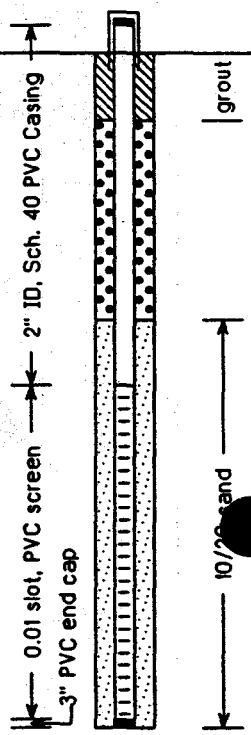
EnSafe/Allen & Hoshall

Monitoring Well 059G02LS

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #59 (Old Pesticide Shop)*
Project No.: *0106-08420*	Surface Elevation: *263.16 feet msl*
Started at *0822 on 3-2-96*	TOC Elevation: *265.18 feet msl*
Completed at *0900 on 3-2-96*	Depth to Groundwater: *10.14 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *255.04 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *D. Ladd, C. Ivey*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							OL	(0-2') Soil, moderate yellowish-brown in color with roots.	261.2
							ML	(2-4.5') Silt, moderate yellowish-brown mottled with olive gray material, predominantly near 4.5'.	258.7
5			1	65			ML	(4.5-9') Clayey silt, olive gray in color. Contains iron-manganese nodules. Mottled with moderate yellowish-brown colored material near 9'.	
								Moist from 5' to 6'.	254.2
10								Dry and crumbly from 7' to 8'.	
								(9-18.5') Silt and silty caly (see descriptions below).	
							ML CL	(9-10') Silt. Moderate yellowish-brown in color mottled with olive gray-colored material. Very common iron-manganese nodules.	
15			2	75				(10-18') Silty clay. Olive gray in color and mottled with moderate yellowish-brown-colored material, mostly moderate yellowish-brown near 10' and again at 18'. Very common iron-manganese nodules.	244.7
20							CL		243.2
								(18-18.5') Silt. Moderate yellowish-brown in color mottled with olive gray-colored material. Dry. Contains common iron-manganese nodules.	
25								(18.5-20') Clay, olive gray in color, moist.	
								Terminated soil boring at 20'. Note: Due to the potential for significant contamination in this soil boring, no samples were field screened for organic vapors so that the well could be completed in minimal time.	
30									
35									
40									

WELL DIAGRAM



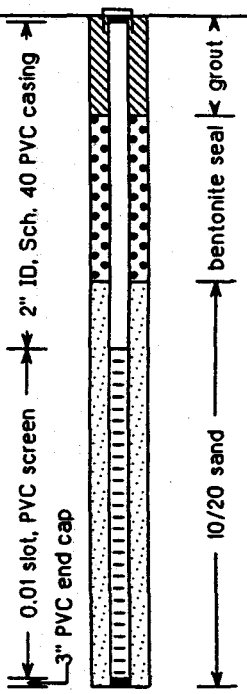
EnSafe/Allen & Hoshall

Monitoring Well 059G03LS

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #59 (Old Pesticide Shop)*
Project No.: *0106-08420*	Surface Elevation: *263.54 feet msl*
Started at *1237 on 3-4-96*	TOC Elevation: *263.35 feet msl*
Completed at *1330 on 3-4-96*	Depth to Groundwater: *9.50 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *253.85 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *10 to 10 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1				OL GW	(0-1') Asphalt, soil, and gravel fill.	262.5
5			2				ML	(1-12') Silt. Moderate yellowish-brown in color mottled with light olive gray material. Organic material and less light olive gray material from 2' to 12'. Moist from 7' to 10'.	
10			3					Very moist from 10' to 12'.	251.5
								No description available; collected a Shelby tube sample from 12' to 15'.	248.5
15							ML	(15-16') Silt, moderate yellowish-brown in color mottled with light olive gray material.	247.5
							ML	(16-20') Silt, light olive gray in color, mottled with a light moderate yellowish-brown material.	243.5
20								Terminated soil boring at 20'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log for adjacent monitoring well 059G03UF.	
25									
30									
35									
40									

WELL DIAGRAM



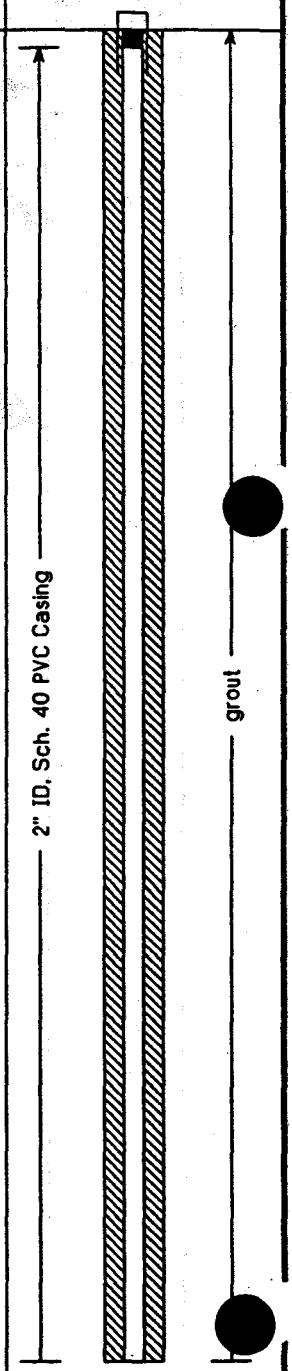
EnSafe/Allen & Hoshall

Monitoring Well 059G03UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #59 (Old Pesticide Shop)*
Project No.: *0106-08420*	Surface Elevation: *263.51 feet msl*
Started at *1337 on 3-4-96*	TOC Elevation: *263.32 feet msl*
Completed at *1457 on 3-4-96*	Depth to Groundwater: *14.63 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - "4 inner core barrel/6" OD casing*	Groundwater Elevation: *248.69 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *44 to 54 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X		1	100			OL GW	(0-1') Asphalt, soil, and gravel fill.	
	X				.8				262.5
	X		2	100				(1-12') Silt, moderate yellowish-brown in color mottled with light olive gray-colored material. Contains organic and less light olive gray material from 2' to 12'.	
					1.0				
5					1.0				
							ML		
			3	95	2.2			Moist from 7' to 10'.	
					1.0				
10								Very moist from 10' to 12'.	
					1.2				
									251.5
			4	83				No description available; collected Shelby tube sample from 12' to 15'.	
15					.6		ML		248.5

WELL DIAGRAM



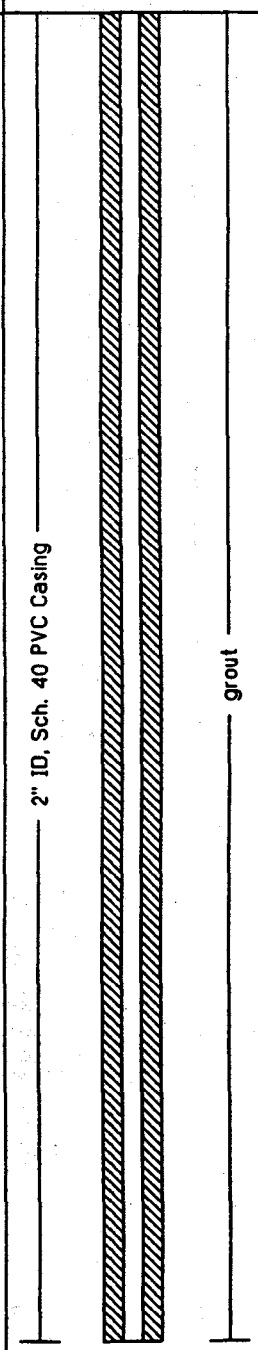
EnSafe/Allen & Hoshall

Monitoring Well 059G03UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #59 (Old Pesticide Shop)*
Project No.: *0106-08420*	Surface Elevation: *263.51 feet msl*
Started at *1337 on 3-4-96*	TOC Elevation: *263.32 feet msl*
Completed at *1457 on 3-4-96*	Depth to Groundwater: *14.63 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - "4 inner core barrel/6" OD casing*	Groundwater Elevation: *248.69 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *44 to 54 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	(15-16') Silt, moderate yellowish-brown in color mottled with light olive gray-colored material.	248.5
					1.4		ML	(16-22') Silt, light olive gray in color, mottled with a light moderate yellowish-brown-colored material from 16' to around 20'.	247.5
					1.6				
20			5	82	2.0				
					1.4		ML	(22-26') Silt, moderate yellowish-brown to dusky yellow in color. Contains iron-staining and iron-manganese nodules.	241.5
25					0.8				
					1.2		ML	(26-31') Silt, moderate yellowish-brown to dark yellowish-orange in color mottled with dark yellowish-brown-colored material.	237.5
					1.4				
30									

WELL DIAGRAM



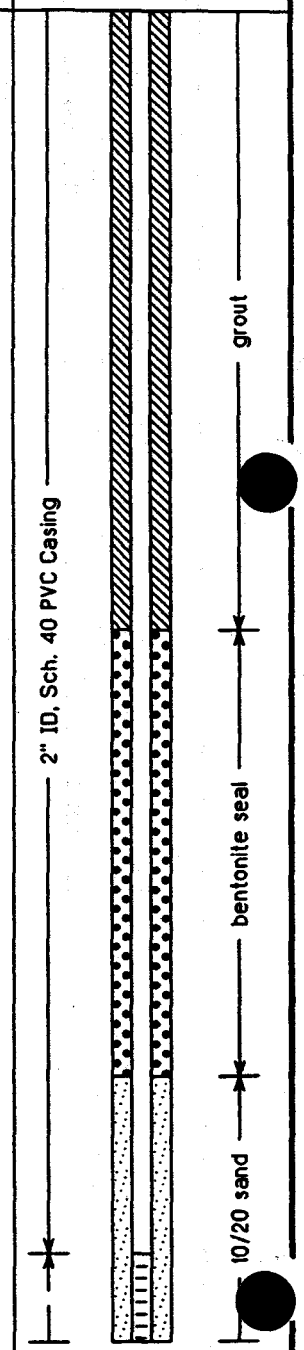
EnSafe/Allen & Hoshall

Monitoring Well 059G03UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #59 (Old Pesticide Shop)*
Project No.: *0106-08420*	Surface Elevation: *263.51 feet msl*
Started at *1337 on 3-4-96*	TOC Elevation: *263.32 feet msl*
Completed at *1457 on 3-4-96*	Depth to Groundwater: *14.63 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic – "4 inner core barrel/6" OD casing*	Groundwater Elevation: *248.69 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *44 to 54 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML		
			6	100	1.4				232.5
								(31-35') Silt, moderate yellowish-brown in color mottled with very fine, very light gray colored sand. Dark yellowish-orange staining and iron-manganese nodules are present near 35'.	
					1.4		ML		
35					1.4				228.5
							SW	(35-36.5') Sand, very fine-grained, very light gray in color mottled with dark yellowish-orange material. Wet.	
								Contains some coarse dark yellowish-orange sand from 36' to 36.5'.	227
					2.4		SW GW		226.5
								(36.5-37') Sand (medium to very coarse-grained) and gravel. Moderate yellowish-brown to dark yellowish-orange in color.	
			7	100			CL		
					2.6			(37-39') Sandy clay, moderate yellowish-brown to dark yellowish- orange in color mottled with very light gray-colored material. Becomes mostly pale yellowish-brown in color near 39'.	224.5
							SM		
40								Top of Fluvial Deposits estimated at 39'.	223.5
								(39-40') Silty sand, medium to coarse-grained, with scattered gravel. Moderate yellowish-brown to dark yellowish-orange. Wet.	
			8	100				No description available; collected a Shelby tube sample from 40' to 43'.	
					1.4				220.5
							SW GW	(43-44.5') Sand, fine to very coarse-grained, moderate yellowish-brown to dark yellowish-orange, and gravel, up to .75" in longest dimension, angular to rounded, composed of quartz and chert, wet.	
			9	125					219
45					1.2		SW GW		

WELL DIAGRAM



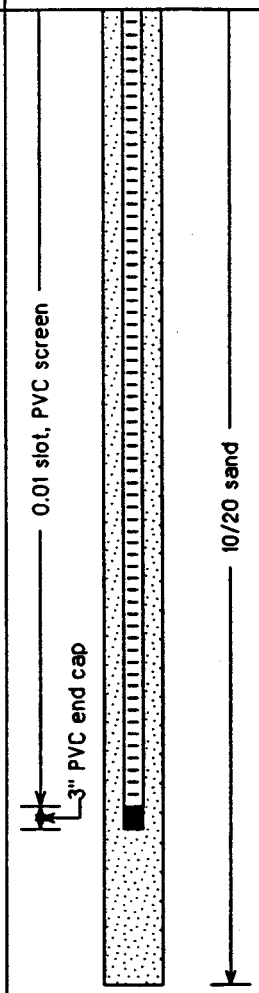
EnSafe/Allen & Hoshall

Monitoring Well 059G03UF

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #59 (Old Pesticide Shop)*
Project No.: *0106-08420*	Surface Elevation: *263.51 feet msl*
Started at *1337 on 3-4-96*	TOC Elevation: *263.32 feet msl*
Completed at *1457 on 3-4-96*	Depth to Groundwater: *14.63 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - "4 inner core barrel/6" OD casing*	Groundwater Elevation: *248.69 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *56 feet*
Geologist: *D. Ladd, W. Parks*	Well Screen: *44 to 54 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					1.2		SW GW	(44.5-47.5') Sand, coarse to very coarse-grained, moderate yellowish- brown to dark yellowish-orange, and gravel, up to 2.5" in longest dimension, composed mostly of angular chert, wet.	216
							SW GW	(47.5-48') Sand, fine to coarse-grained, very light gray and mottled with dark yellowish-orange, and gravel, up to 1.5" in longest dimension, composed mostly of angular to rounded quartz and chert, wet.	215.5
					1.0		SW		214.5
50							SW GW	(48-49') Sand, fine to medium-grained, with rare quartz gravel. Yellowish-gray in color mottled with dark yellowish-orange material, slightly micaceous, wet.	
			10	130	1.6			(49-51.5') Sand (fine to coarse-grained) and gravel (mostly quartz and chert); dark yellowish-orange in color mottled with yellowish-gray material; micaceous; wet.	212
					1.6		SW GW	(51.5-53.5') Sand, fine to very coarse-grained, and gravel (quartz and chert) is up to .75" in longest dimension; yellowish-gray and wet.	210
55					0.8		SW	(53.5-56') Sand, fine to medium-grained, with rare gravel. Yellowish- gray color, micacous, wet.	207.5
60								Terminated soil boring at 56'.	

WELL DIAGRAM



SWMU 60

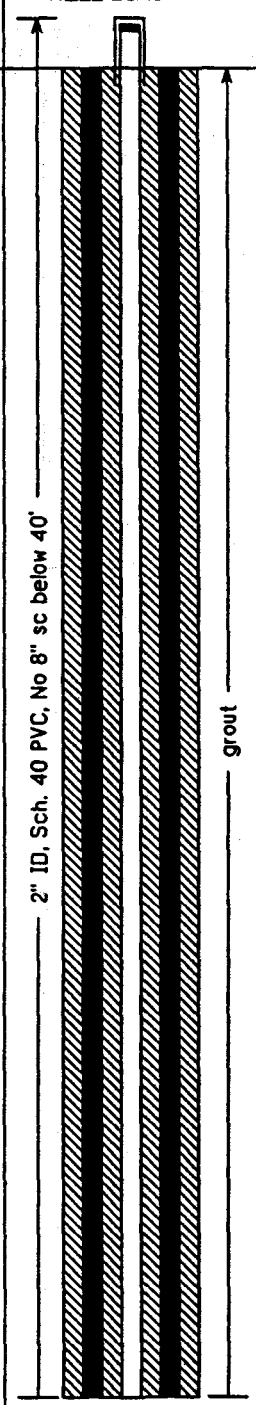
EnSafe/Allen & Hoshall

Monitoring Well 60MW01LF

Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 North Landfill*
Project No.: *N0094*	Surface Elevation: *269.19 feet msl*
Started at *0700 on 1-31-95*	TOC Elevation: *271.44 feet msl*
Completed at *0845 on 2-02-95*	Depth to Groundwater: *20.49 feet* Measured: *03/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *250.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *75.0 feet*
Geologist: *David Ladd (40'-75'), Joe Matthews (0'-40')*	Well Screen: *65 to 75 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, pale olive with heavy black staining at 0'-1' and 5'-7'.	
5			1	80	468				
10			2	60	313			Silt, dark yellowish orange to moderate yellowish brown, has light olive gray silt inclusions and iron streaking.	
15			3	100	3.4			Silt, olive gray to medium dark gray with moderate yellowish brown silt inclusions from 15'-20'. Black staining present at 15'-17'. No staining present from 20'-25'.	
20					30.8		ML		
25								Silt, light olive gray to greenish gray, iron staining present (25'-30.5').	
30								Silt, moderate yellowish brown and dry (30.5'-40'). Some light gray silt from 38'-40', but mostly moderate yellowish brown.	
35			4	85	BG				
40			5	100	BG				

WELL DIAGRAM



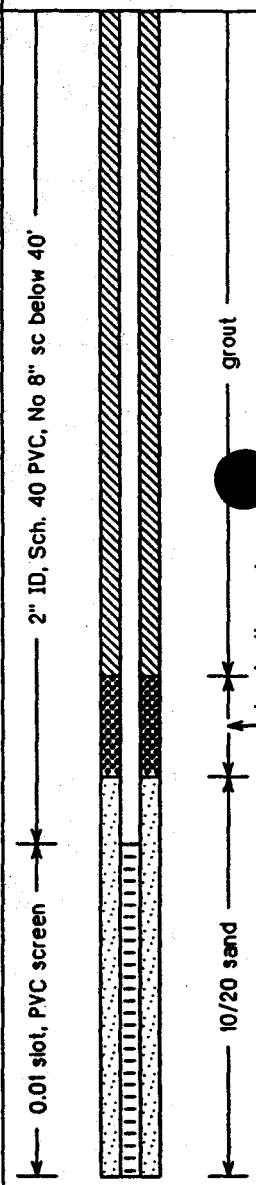
EnSafe/Allen & Hoshall

Monitoring Well 60MW01LF

Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 North Landfill*
Project No.: *N0094*	Surface Elevation: *269.19 feet msl*
Started at *0700 on 1-31-95*	TOC Elevation: *271.44 feet msl*
Completed at *0845 on 2-02-95*	Depth to Groundwater: *20.49 feet* Measured: *03/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *250.95 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *75.0 feet*
Geologist: *David Ladd (40'-75'), Joe Matthews (0'-40')*	Well Screen: *65 to 75 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML	Silt, dark yellowish brown.	228.7
45							GP	Gravel and sand, poorly sorted and silty, yellowish gray to dark yellowish orange. Gravel is chert and quartz with chert pebbles up to 2.5" LD.	219.7
50							SP	Sand, fine to coarse grained, yellowish gray to dark yellowish orange, contains some scattered gravel.	212.2
55			6	90	BG				
60							SP	Sand and gravel, poorly sorted and silty, yellowish gray to dark yellowish orange. Gravel is chert and quartz.	204.2
65			7	90	BG		GP	Gravel and sand, dark yellowish orange to moderate brown, chert and quartz gravel up to 2.5" LD.	201.7
70							SP	Sand and gravel, dark yellowish orange to yellowish orange. Gravel content increasing from 72'-74.5'.	194.7
75			8	110	BG		CL	Clay, moderate gray to brownish gray, waxy, contains some very fine sand.	194.2
80								End of Boring. Boring terminated at 75'. BG = Background	

WELL DIAGRAM



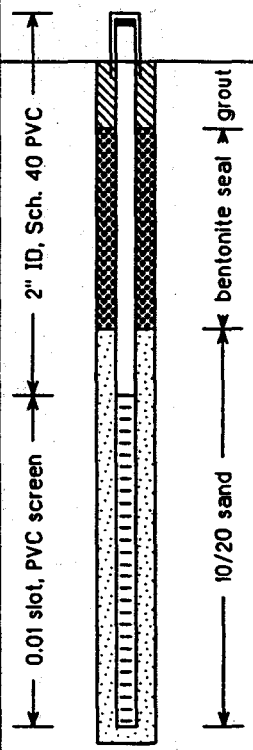
EnSafe/Allen & Hoshall

Monitoring Well 60MW01LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU 60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *269.25 feet msl*
Started at *on 1-31-95*	TOC Elevation: *271.87 feet msl*
Completed at *on 1-31-95*	Depth to Groundwater: *3.30 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *268.57 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ryan Lister*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, pale olive with heavy black staining at 0'-1' and 5'-7'.	
5			1	80	46.8				
10			2	60	313		ML	Silt, dark yellowish orange to moderate yellowish brown, has light olive gray silt inclusions and iron streaking.	
15			3	100	3.4			Silt, olive gray to medium dark gray with moderate yellowish brown silt inclusions from 15'-20'. Black staining present at 15'-17'. No staining present from 17'-20'.	
20			4	85	30.8			Geologic description and collected analytical samples are taken from paired well MW-01-LF.	249.2
25									
30									
35									
40									

WELL DIAGRAM



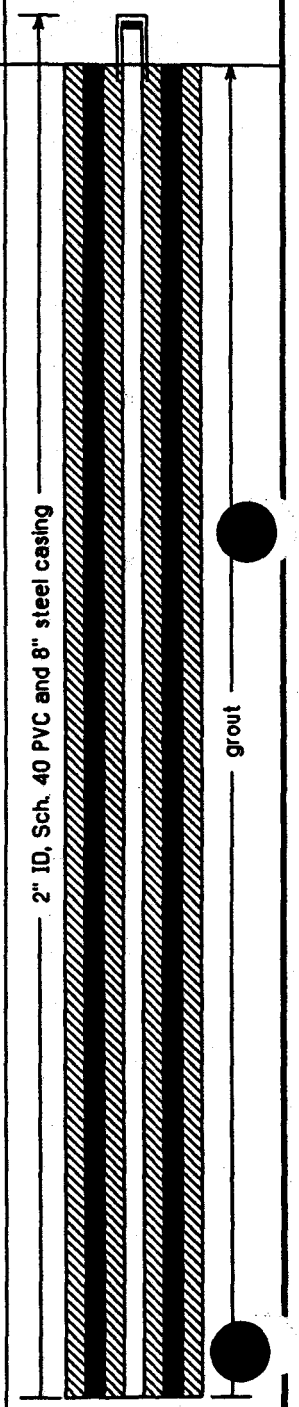
EnSafe/Allen & Hoshall

Monitoring Well 60MW02LF

Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *268.43 feet msl*
Started at *1120 on 2-01-95*	TOC Elevation: *270.90 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *20.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *250.90 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *95.0 feet*
Geologist: *Joe M. (0'-42'), David L. and Jack C. (42'-95')*	Well Screen: *83 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, moderate yellowish brown with organics. Roots occuring at .5' and 4'. 1" gravel section at 1' stained black.	
5			1	70	BG				
10			2	90	BG			Silt, moderate yellowish brown , with a greenish gray to light olive gray silt swirled throughout. Fe staining at 9.5'.	
15			3	100	BG			Silt, olive gray with iron nodules to one quarter of an inch.	
20							ML		
25			4	65	BG			Silt, olive gray to medium light gray, iron nodules present 25'-30'.	
30								Silt, dark yellowish orange with a light olive gray to light gray silt swirled througout.	
35									
40							GP	Silt, light gray, but making a transition to olive gray at 39.5'-40'.	228.4

WELL DIAGRAM



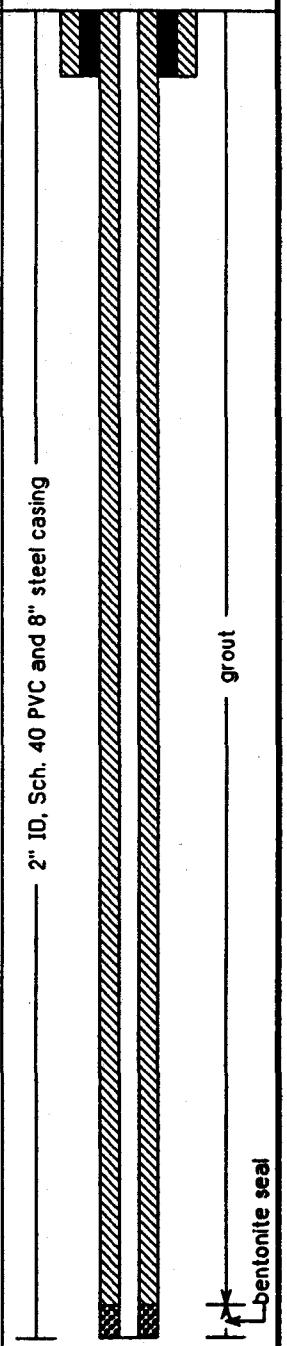
EnSafe/Allen & Hoshall

Monitoring Well 60MW02LF

Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *268.43 feet msl*
Started at *1120 on 2-01-95*	TOC Elevation: *270.90 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *20.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *250.90 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *95.0 feet*
Geologist: *Joe M. (0'-42'), David L. and Jack C. (42'-95')*	Well Screen: *83 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Lost core from 40'-43'.	228.4
45	X		5	93	BG		GP	Gravel, sandy but relatively clean, yellowish brown. Chert and quartz gravels up to 2.5" LD.	221.9
							SP	Sand and gravel, yellowish gray to yellowish brown, stained yellowish orange near 49'. Sand is fine to very coarse grained, silty.	219.4
50							SP	Sand with some gravel, yellowish gray, fine to very coarse grained, relatively clean.	214.4
55			6	100	BG		SP	Sand and gravel, yellowish gray to yellowish brown, locally stained yellowish orange. Gravel is chert and quartz, sand is fine to very coarse grained.	204.4
60									
65			7	90	BG		SP	Sand with some gravel, dark yellowish orange, fine to coarse grained.	194.4
70									
75			8	90	BG		GP	Gravel and sand, dark yellowish orange to yellowish brown, gravel up to 2.5" LD.	191.4
							SP	Sand with some gravel, dark yellowish orange, fine to coarse grained.	
80									

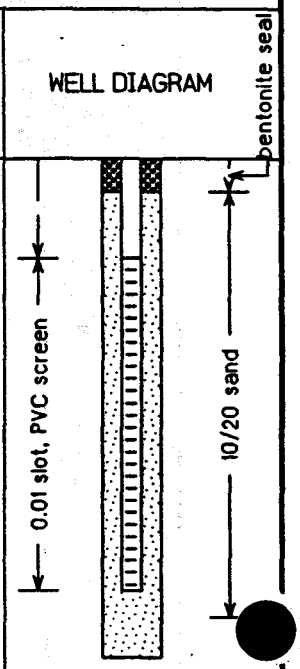
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 60MW02LF
Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *268.43 feet msl*
Started at *1120 on 2-01-95*	TOC Elevation: *270.90 feet msl*
Completed at *on 2-07-95*	Depth to Groundwater: *20.00 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *250.90 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *95.0 feet*
Geologist: *Joe M. (0'-42'), David L. and Jack C. (42'-95')*	Well Screen: *83 to 93 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							SP		
							GP	Gravel and sand, dark yellowish orange to yellowish brown.	186.4
85			9	90	BG		GW	Gravel ("fairly clean"), sandy, dark yellowish orange to yellowish brown.	183.4
							SP	Sand coarse with gravel, grayish brown to dark yellowish orange.	181.4
90									
							ML	Silt, clayey, grayish brown, laminated (1/8" to 1/16"), stiff, finely micaceous, dry.	175.4
95			10	100	BG			End of boring. Boring terminated at 95', but bottom of well will be set at 93'.	173.4
								BG = Background	
100									
105									
110									
115									
120									

WELL DIAGRAM



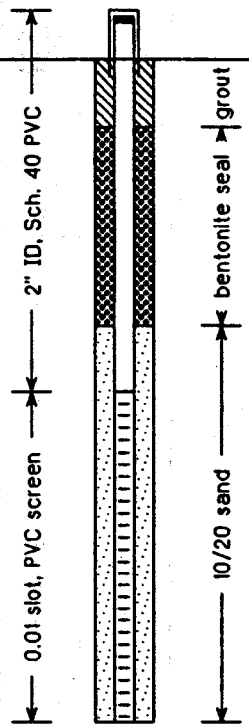
EnSafe/Allen & Hoshall

Monitoring Well 60MW02LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#60 - North Landfill*
Project No.: *N0094*	Surface Elevation: *268.85 feet msl*
Started at *0830 on 2-01-95*	TOC Elevation: *270.84 feet msl*
Completed at *1015 on 2-01-95*	Depth to Groundwater: *3.860 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *266.98 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ryan Lister*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
5	X		1	70	BG		ML	Silt, moserate yellowish brown with organics. Roots occuring at .5' and 4'. 1" gravel section at 1' stained black.	
10	X		2	90	BG			Silt, moderate yellowish brown , with a greenish gray to light olive gray silt swirled throughout. Staining also at 9.5'.	
15	X		3	100	BG			Silt, olive gray with iron nodules to one quarter of an inch.	
20	X		4	85	BG			End of boring. Total depth of boring at 20'. Analytical and geologic description taken from paired well MW-02-LF. BG = Background	248.9
25									
30									
35									
40									

WELL DIAGRAM



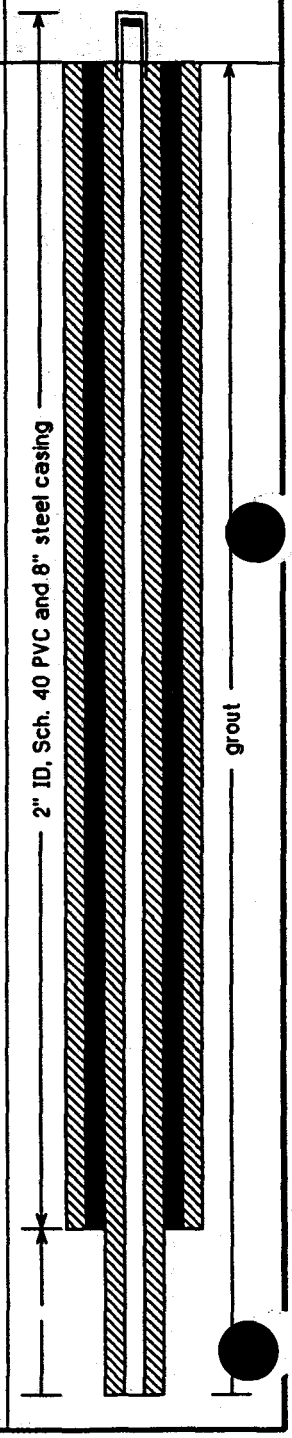
EnSafe/Allen & Hoshall

Monitoring Well 60MW03LF

Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *268.90 feet msl*
Started at *1330 on 2-01-95*	TOC Elevation: *271.52 feet msl*
Completed at *1630 on 2-07-95*	Depth to Groundwater: *20.02 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *251.50 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *95.0 feet*
Geologist: *Joe Matthews (0'-35'), Jack Carmichael (35'-95')*	Well Screen: *77 to 87 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, moderate yellowish brown with organics, very dry.	
5			1	100	BG				
10			2	80	BG				
								Silt, greenish gray to light gray.	
15			3	100	BG				
20			4		BG		ML		
25			5	80	BG				
								Silt, clayey, greenish gray.	
30			6		BG				
								Silt, calyey, greenish gray, iron staining and light gray silt swirling.	
								Silt, dark yellowish orange with a light olive gray to light gray silt swirled througout.	
35			7		BG				
								Silt, light olive gray.	
40			8	93	BG		GM		228.9

WELL DIAGRAM



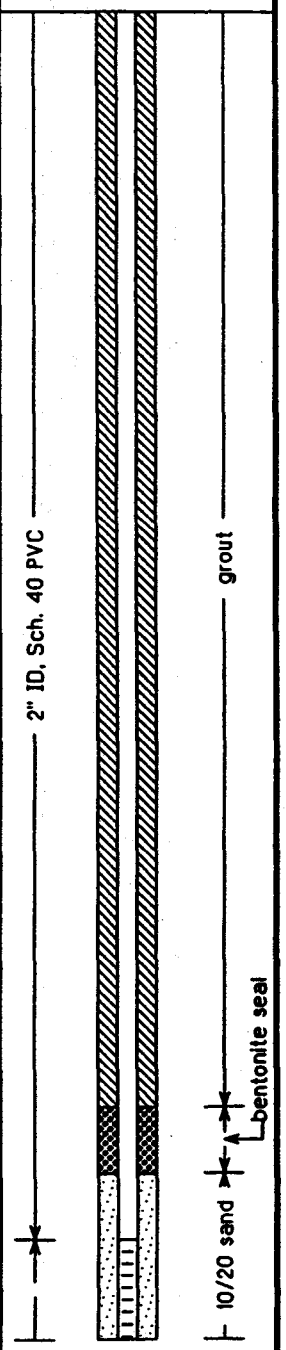
EnSafe/Allen & Hoshall

Monitoring Well 60MW03LF

Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 - North Landfill*
Project No.: *N0094*	Surface Elevation: *268.90 feet msl*
Started at *1330 on 2-01-95*	TOC Elevation: *271.52 feet msl*
Completed at *1630 on 2-07-95*	Depth to Groundwater: *20.02 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *251.50 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *95.0 feet*
Geologist: *Joe Matthews (0'-35'), Jack Carmichael (35'-95')*	Well Screen: *77 to 87 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									228.9
45			9	70	BG		GM	Alternating sand w/ gravel and gravel w/ sand, silty, trace clay, some intervals of real clean gravel to 1/2" (~3"-6"), dark yellowish orange to grayish orange, pink, wet.	
									220.9
							ML	Silt, clayey, sandy, pale yellowish brown, moist, from 48'-55', alternating layers (from 6" to 2') of sandy gravel and gravelly sand, pinkish gray to dark yellowish orange, supersaturated interval from 49'-50.5'.	219.9
50			10		BG		SP/GP		
55			11	100	BG				213.9
								Sand, fine to coarse with gravel and siltvery pale to dark yellowish orange, wet.	
60			12		BG		SP		
65			13	100	BG				203.9
								Sand, fine to coarse, trace silt, gravelly, gravel increasing in size and number between 70'-75'. Color generally dark yellowish orange, wet.	
70			14		BG		GM		
75			15	95	BG				193.9
								Same as above, fairly clean gravelly layer from 75' to 77'.	
							GW		
80			16		BG		SP		188.9

WELL DIAGRAM



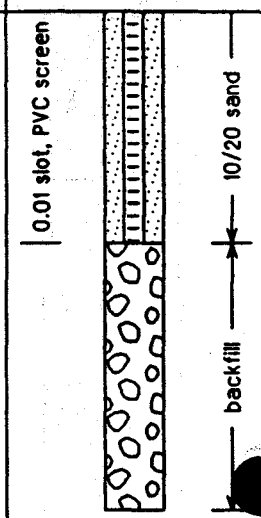
EnSafe/Allen & Hoshall

Monitoring Well 60MW03LF

Project: *NAS Memphis*	Location: *Millington TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *268.90 feet msl*
Started at *1330 on 2-01-95*	TOC Elevation: *271.52 feet msl*
Completed at *1630 on 2-07-95*	Depth to Groundwater: *20.02 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *251.50 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *95.0 feet*
Geologist: *Joe Matthews (0'-35'), Jack Carmichael (35'-95')*	Well Screen: *77 to 87 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
									188.9
85			17	95	BG		SP		
									181.4
90			18		BG		CL	Silt, clayey, grayish brown, stiff, mottled with laminations to to the end of the run at 95'.	
95			11	110	BG				173.9
								End of Boring. Boring terminated at 95'.	
100									
105									
110									
115									
120									

WELL DIAGRAM



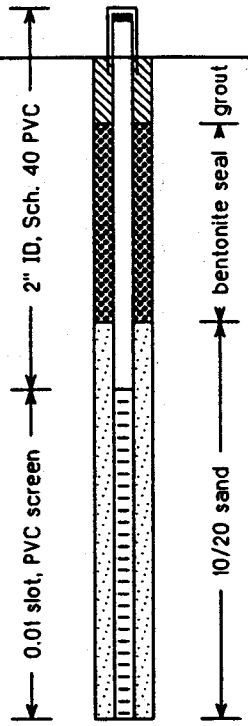
EnSafe/Allen & Hoshall

Monitoring Well 60MW03LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *269.60 feet msl*
Started at *on 2-01-95*	TOC Elevation: *271.40 feet msl*
Completed at *on 2-01-95*	Depth to Groundwater: *7.03 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *264.37 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ryan Lister*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
5			1	100	BG			Silt, moderate yellowish brown with organics, very dry.	
10			2	80	BG		ML		
15			3	100	BG			Silt, greenish gray to light gray.	
20			4	80	BG			End of Boring. Boring terminated at 20'. Geologic description and analytical samples taken from MW-03-LF.	249.6
25									
30									
35									
40									

WELL DIAGRAM



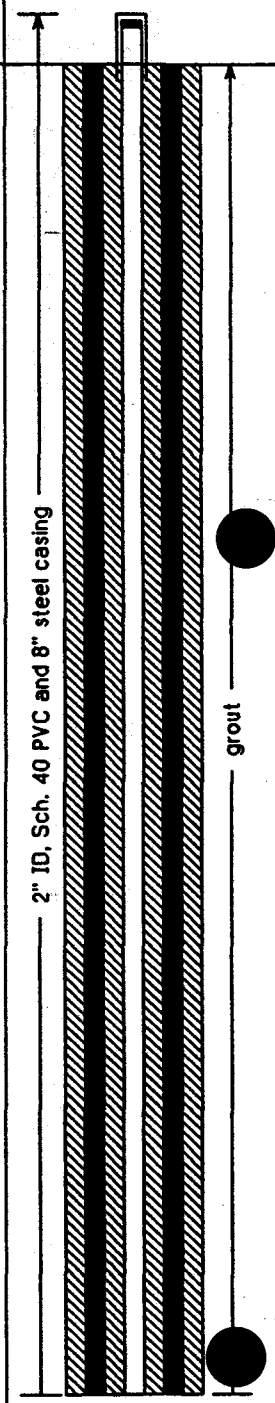
EnSafe/Allen & Hoshall

Monitoring Well 60MW04LF

Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *269.67 feet msl*
Started at *0915 on 1-31-95*	TOC Elevation: *272.20 feet msl*
Completed at *1215 on 2-08-95*	Depth to Groundwater: *20.70 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *251.61 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *96.0 feet*
Geologist: *Joe Matthews (0'-40'), Jack Carmichael (40'-96')*	Well Screen: *86 to 96 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Silt, moderate yellowish brown with organics, very dry.	
5			1	80	BG			Silt, moderate yellowish brown with fewer organics. Wet from 5'-9', but becomes wet at 9'-10'.	
10			2	80	BG				
15			3	100	80.1			Silt, medium light gray, moist down to 20.5 then becoming dry. Some iron staining at 27'.	
20			4		3.4		ML		
25			4	90	BG				
30			5		2.9				
35			6		60.2			Silt, moderate yellowish brown, dry to slightly moist.	
40			7	87	BG				

WELL DIAGRAM



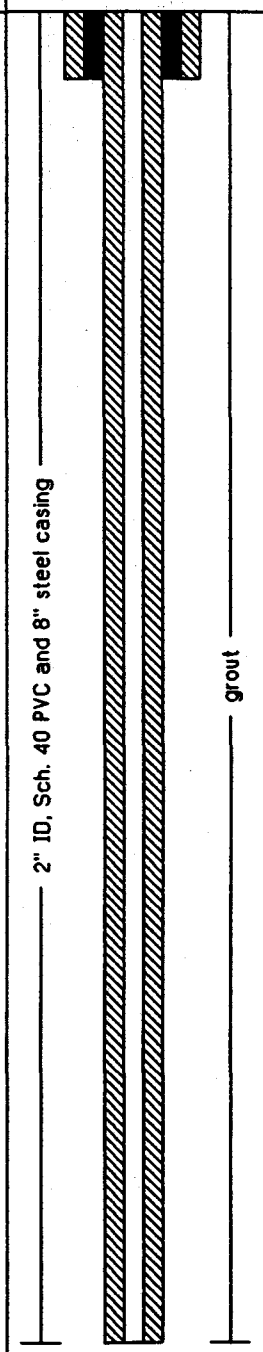
EnSafe/Allen & Hoshall

Monitoring Well 60MW04LF

Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *269.67 feet msl*
Started at *0915 on 1-31-95*	TOC Elevation: *272.20 feet msl*
Completed at *1215 on 2-08-95*	Depth to Groundwater: *20.70 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *251.61 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *96.0 feet*
Geologist: *Joe Matthews (0'-40'), Jack Carmichael (40'-96')*	Well Screen: *86 to 96 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
							ML		
45			8		BG			Sand, gravelly, silt and gravel (perticularly in the lower 3'), clayey gravel seam at 51.5'-52, colors range from grayish brown to dark yellowish orange, wet.	224.7
50			9		BG				
55			10	90	BG			Sand, gravelly, and silty. Same color as above, color change from 55' -58' turning pinkish gray then becoming yellowish gray to dark yellowish orange from 58'-65', wet.	
60			11		BG		SP		
65			12	95	BG				
70			13		BG			Same as above, sand coarsening and gravel increasing towards the bottom of run. Color becoming mostly dark yellowish orange below 68'.	
75			8	90	BG				
80			9	100	BG			Same as above, gravel increasing in number and size towards the bottom of run, generally grayish orange, wet.	

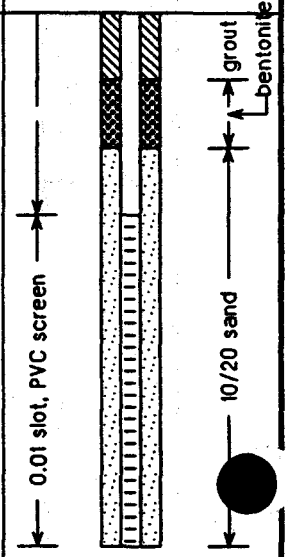
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 60MW04LF
Project: *NAS Memphis*	Location: *Memphis, TN*
Project No.: *N0094*	Surface Elevation: *269.67 feet msl*
Started at *0915 on 1-31-95*	TOC Elevation: *272.20 feet msl*
Completed at *1215 on 2-08-95*	Depth to Groundwater: *20.70 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *251.61 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *96.0 feet*
Geologist: *Joe Matthews (0'-40'), Jack Carmichael (40'-96')*	Well Screen: *86 to 96 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
85							SP	Sand, gravelly with silt, gravel up to 2" in LD towards bottom. Color mostly dark yellowish orange, wet.	
			10	87.5	BG				181.7
90							GM	Gravel, sandy, silty and clayey. Cobbles up to 3" in diameter, very dark yellowish orang, wet, (very tough drilling, 90'-94').	
95			11	112.5	BG		SM	Sand, fine, upper 2" dark reddish brown iron stained, lower 3"-4" laminated pale brown, moist.	174.2 173.7
100								End of boring at 96'. BG = Background (1.1 ppm)	
105									
110									
115									
120									

WELL DIAGRAM



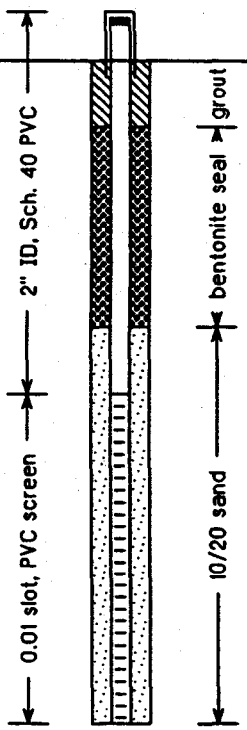
EnSafe/Allen & Hoshall

Monitoring Well 60MW04LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *269.57 feet msl*
Started at *0915 on 1-31-95*	TOC Elevation: *272.11 feet msl*
Completed at *1215 on 1-31-95*	Depth to Groundwater: *4.95 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *267.16 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Ryan Lister*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
	X							Silt, moderate yellowish brown with organics, very dry.	
5	X		1	80	BG			Silt, moderate yellowish brown with fewer organics. Wet from 5'-9', but becomes wet at 9'-10'.	
10	X		2	80	BG		ML		
15	X		3	100	80.1			Silt, medium light gray, moist down to 20.5 then becoming dry. Some iron staining at 27'.	
20	X		4		3.4			End of boring at 40'. Geologic description and analytical samples are taken from paired well MW-04-LF.	249.6
25									
30									
35									
40									

WELL DIAGRAM



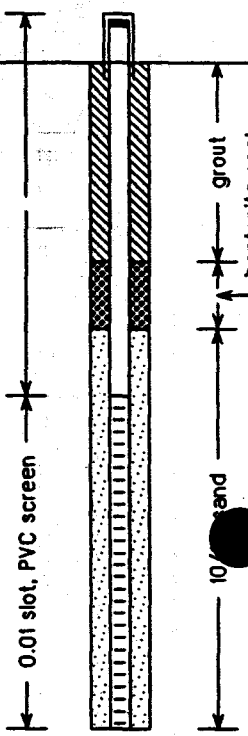
EnSafe/Allen & Hoshall

Monitoring Well 60MW05LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *269.75 feet msl*
Started at *0830 on 2-13-95*	TOC Elevation: *271.88 feet msl*
Completed at *0900 on 2-13-95*	Depth to Groundwater: *4.09 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *267.89 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill, dark brown silt with scattered gravel.	
								Silt, clayey, soft, light olive gray to grayish orange, mottled, dark brown inclusions (organics?) throughout, moist, finely laminated.	
5			1	100	1.4			Silt, some clay, greenish gray, mottled dark yellowish orange, laminated, soft, moist.	
								Silt, some clay w/inclusions, finely mottled, yellowish orange, laminated, with dark inclusions (organics?), soft, moist.	
10			2	80	BG		ML		
15			3	90	BG			Silt, clayey, pale yellowish brown, fewer laminations and inclusions than above, becoming stained dark yellowish orange from 18'-19', moist.	
20			4	80	BG			Silt, clayey, medium gray, massive, moist.	249.7
25								BG = Background (1.1 ppm)	
30									
35									
40									

WELL DIAGRAM



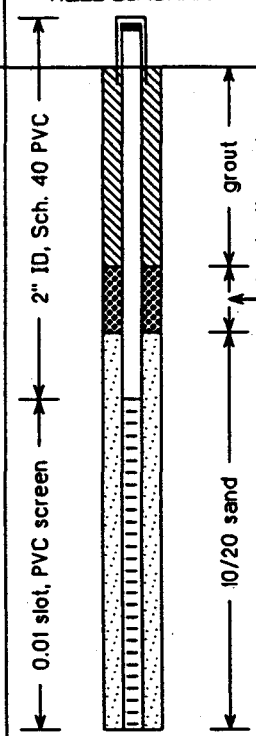
EnSafe/Allen & Hoshall

Monitoring Well 60MW06LS

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#60 – North Landfill*
Project No.: *N0094*	Surface Elevation: *269.58 feet msl*
Started at *1020 on 2-13-95*	TOC Elevation: *271.98 feet msl*
Completed at *1050 on 2-13-95*	Depth to Groundwater: *3.37 feet* Measured: *3/31/95*
Drilling Method: *Rotasonic*	Groundwater Elevation: *268.58 feet msl*
Drilling Company: *North Star Drilling*	Total Depth: *20.0 feet*
Geologist: *Jack Carmichael*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Fill, dark brown silt, clay, some gravel and pieces of burnt wood.	268.6
							ML	No sample description; poor recovery.	
5			1	40	BG			Silt, clayey, moderate yellowish brown to grayish orange, mottled dark brown inclusions (organics?), soft, moist.	264.6
10			2	133	BG			Silt, clayey moderate yellowish brown , mottled w/ 1/16"-1/8" dark inclusions (organics?), finely laminated, soft moist, becoming stained dark yellowish orange from 12.5'-13' becoming stained dark yellowish orange from 12.5'-13' then med. gray to dark yellowish orange from 13'-14'.	
15			3	130	BG			Silt, clayey, medium gray, massive, soft, moist.	
								Silt, clayey, medium gray, massive, moist, soft.	
20			4	100	BG				249.6
25								BG = Background (1.1 ppm)	
30									
35									
40									

WELL DIAGRAM



SWMU 65

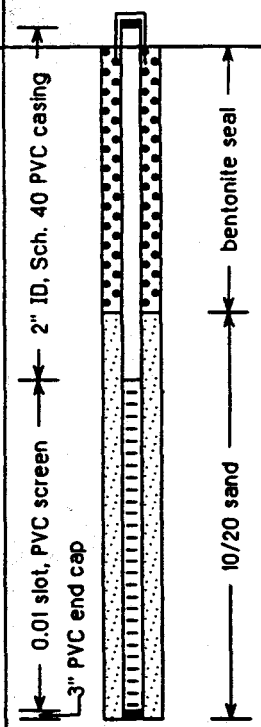
EnSafe/Allen & Hoshall

Monitoring Well 065G05UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #65 (Training Mock-Up Site)*
Project No.: *0106-08420*	Surface Elevation: *264.10 feet msl*
Started at *1230 on 2-17-96*	TOC Elevation: *266.04 feet msl*
Completed at *1320 on 2-17-96*	Depth to Groundwater: *3.99 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *262.05 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *J. Kingsbury*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG			(0-20') Upper Alluvium (see descriptions below).	
					BG		CL	Clay, brownish-gray in color, hard and dry.	
5			1	100	BG				259.1
					BG			Silt. From 5' to 8', is very light brown in color and moist.	
					BG			From 8' to 18', silt is yellowish-brown to yellowish-gray in color, with specks of organic material and some orangish-colored staining.	
10					BG				
					BG		ML		
15			2	70	BG				
					BG				
					BG			At 18', color changes to greenish-gray/olive gray. Very moist to wet with some snail shells present.	244.1
20								Terminated soil boring at 20'.	
25									
30									
35									
40									

WELL DIAGRAM



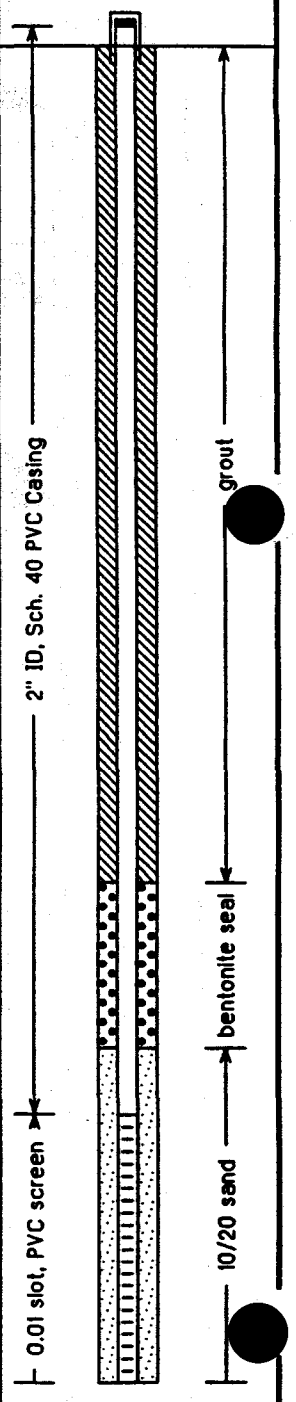
EnSafe/Allen & Hoshall

Monitoring Well 065G06DA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #65 (Training Mock-Up Site)*
Project No.: *0106-08420*	Surface Elevation: *264.18 feet msl*
Started at *0815 on 2-17-96*	TOC Elevation: *266.12 feet msl*
Completed at *0930 on 2-17-96*	Depth to Groundwater: *9.62 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *256.50 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *46 feet*
Geologist: *J. Kingsbury*	Well Screen: *32 to 42 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		ML	(0-29') Upper Alluvium (see descriptions below).	
			1	25	BG			Silt. Light brown to yellowish-brown in color.	262.2
5					BG		CL	Clay. Brownish-gray to light brown in color. Hard.	258.2
					BG			Silt. Yellowish-gray to yellowish-brown in color. Rare organics with iron-stained haloes around them from 6' to 12'.	
					BG				
10			2	120	BG		ML		
					BG			From 12' to 14', increase in orange-colored iron staining and mottling. Silt is yellowish-brown to with some gray, and moist.	250.2
15			3	100				No description available; collected Shelby tube sample from 14' to 16'.	248.2
					BG			Silt, yellowish-brown with some gray, with orange-colored iron staining and mottling, moist to wet.	
					BG				
20			4	90	BG			From 20' to 34', clayey silt, olive gray to brownish-gray, with some snail shells, moist.	
					BG				
25					BG		ML		
					BG				
					BG			With lenses of sand from 28' to 34'.	
30					BG			Top of Deeper Alluvium deposits estimated at 29'.	
			5	83	BG				
									230.2
35					BG		SW	Sand, dusky yellow to olive gray, with gravel up to 1" in longest dimension. Percentage of gravel increases with depth to 38'.	
					BG				226.2
			6	100				No description available; collected Shelby tube sample from 38' to 40'.	
40							SW/GW		224.2

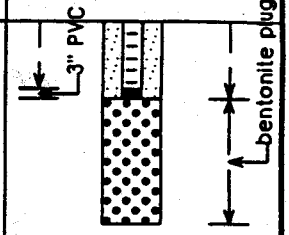
WELL DIAGRAM



EnSafe/Allen & Hoshall	Monitoring Well 065G06DA
Project: *NSA Memphis*	Location: *Millington, TN. SWMU #65 (Training Mock-Up Site)*
Project No.: *0106-08420*	Surface Elevation: *264.18 feet msl*
Started at *0815 on 2-17-96*	TOC Elevation: *266.12 feet msl*
Completed at *0930 on 2-17-96*	Depth to Groundwater: *9.62 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *256.50 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *46 feet*
Geologist: *J. Kingsbury*	Well Screen: *32 to 42 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		SW/GW	Sand and gravel.	224.2
			7	125	BG		CL	Cockfield Formation: Brown stiff clay with fine-grained sand interbeds.	222.2
45					BG				218.2
								Terminated soil boring at 46'.	
50									
55									
60									
65									
70									
75									
80									

WELL DIAGRAM



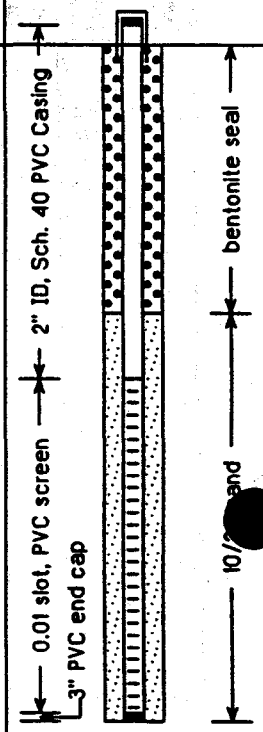
EnSafe/Allen & Hoshall

Monitoring Well 065G06UA

Project: *NSA Memphis*	Location: *Millington, TN. SWMU #65 (Training Mock-Up Site)*
Project No.: *0106-08420*	Surface Elevation: *264.25 feet msl*
Started at *0930 on 2-17-96*	TOC Elevation: *266.28 feet msl*
Completed at *1045 on 2-17-96*	Depth to Groundwater: *4.90 feet* Measured: *4/8/96*
Drilling Method: *Rotasonic - 4" inner core barrel/6" OD casing*	Groundwater Elevation: *261.38 feet msl*
Drilling Company: *Alliance Environmental, Inc.*	Total Depth: *20.25 feet*
Geologist: *J. Kingsbury*	Well Screen: *10 to 20 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
		◢	1				ML	(0-20') Upper Alluvium (see descriptions below).	
								Silt. Light brown to yellowish-brown in color.	262.2
							CL	Clay. Brownish-gray to light brown in color. Hard.	
5									258.2
		◢	2					Silt. Yellowish-gray to yellowish-brown in color. Rare organics with iron-stained haloes around them from 6' to 12'.	
10							ML		
		◢	3					From 12' to 14', increase in orange-colored iron staining and mottling. Silt is yellowish-brown to with some gray, and moist.	250.2
15								No description available; collected Shelby tube sample from 14' to 16' in 65MW06DA.	248.2
							ML	Silt, yellowish-brown with some gray, with orange-colored iron staining and mottling, moist to wet.	
20								Terminated soil boring at 20'. Note: No samples were collected for lithologic description. These descriptions were transferred from the log of adjacent monitoring well 65MW06DA.	244.2
25									
30									
35									
40									

WELL DIAGRAM



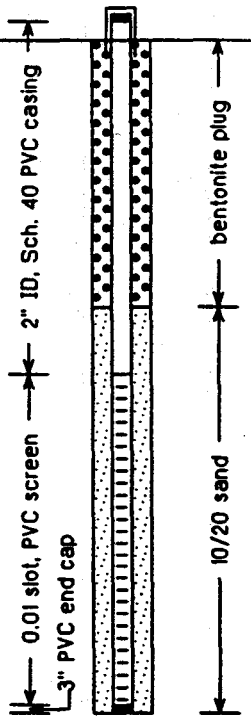
EnSafe/Allen & Hoshall

Monitoring Well 065G07UA

Project: NSA Memphis	Location: Millington, TN. SWMU #65 (Training Mock-Up Site)
Project No.: 0106-08420	Surface Elevation: 262.85 feet msl
Started at 1100 on 2-17-96	TOC Elevation: 264.86 feet msl
Completed at on 2-17-96	Depth to Groundwater: 4.13 feet Measured: 4/8/96
Drilling Method: Rotasonic - 4" inner core barrel/6" OD casing	Groundwater Elevation: 260.73 feet msl
Drilling Company: Alliance Environmental, Inc.	Total Depth: 20.25 feet
Geologist: J. Kingsbury	Well Screen: 10 to 20 feet

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
					BG		ML	(0-20') Upper Alluvium (see descriptions below).	
					BG			Fill material is present from 0' to 2'. Silt with some gravel, brown in color.	260.9
5			1	100	BG		CL	Clay, brown in color, hard and dry.	
					BG				
					BG				253.9
10					BG			Silt, yellowish-gray to yellowish-brown in color, moist.	
					BG			Some mottling with dark yellowish-orange stained material from 10' to 20'.	
15			2	70	BG		ML		
					BG				
					BG			Silt exhibits a color change near 20' to olive gray/greenish-gray.	
20								Terminated soil boring at 20'.	242.9
25									
30									
35									
40									

WELL DIAGRAM



CASING ELEVATION: 263.74

DATUM: Mean Sea Level

WELL LOCATION:

MW-1

(065MW01UA)

DATE & TIME BEGAN: 10/29/92; 2:00pm

DESCRIPTION OF WEATHER: Cloudy 70°F

DRILLER: J. Rowland

INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 15.0

DATE & TIME: 10/29/92 3:00pm

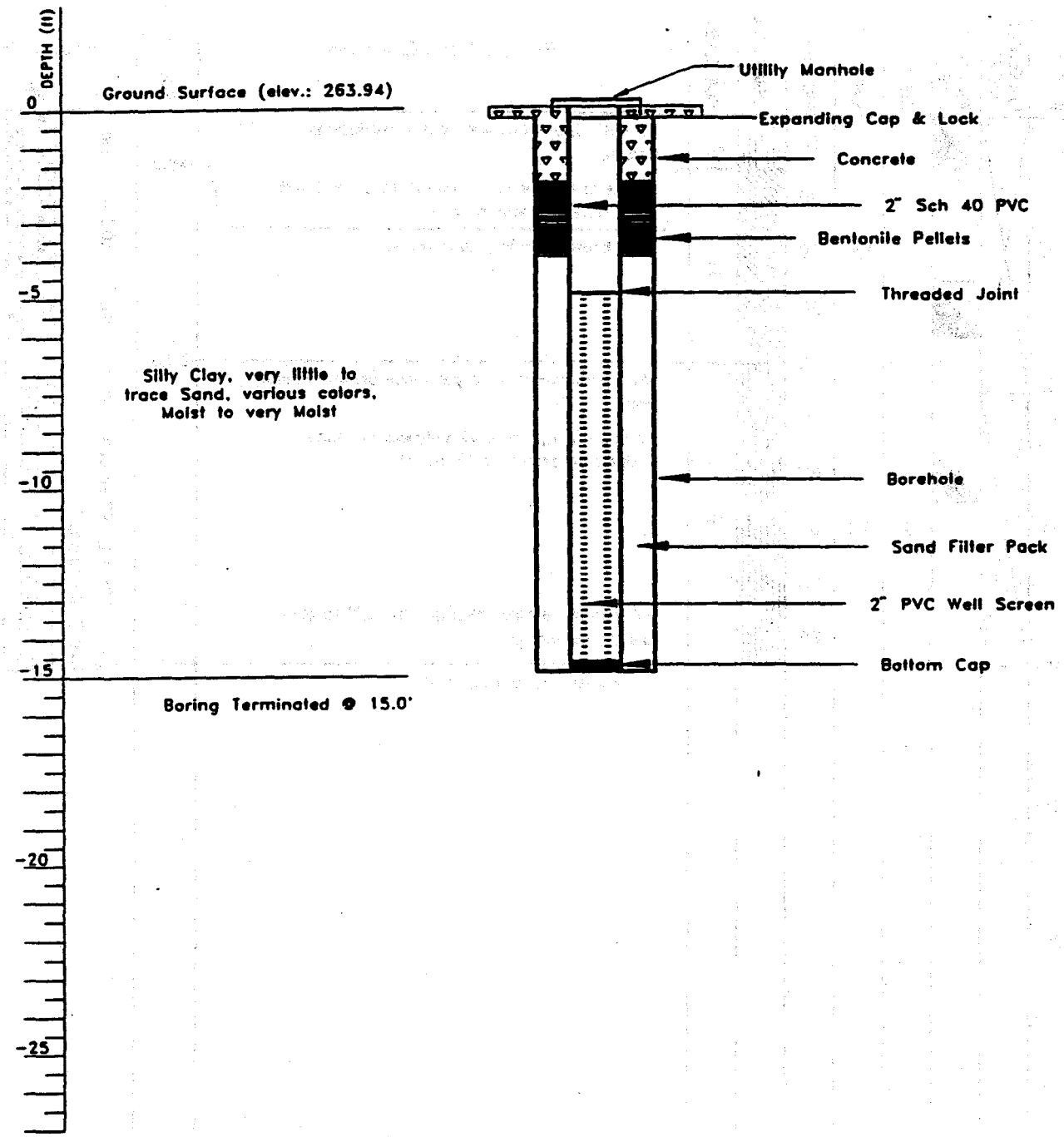
DRILLING TECHNIQUE:

Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
11/04/92	258.83
11/23/92	259.54



MEMPHIS ENVIRONMENTAL CENTER, INC.

2003 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO.	NASMW-2
DRAWN:	DKD
DATE:	NOVEMBER 23, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION MEMPHIS
BUILDING 362 TRAINING MOCK-UP AREA
MILLINGTON, TENNESSEE

CASING ELEVATION: 263.27

DATUM: Mean Sea Level

WELL LOCATION:

MW-2

(065MW02UA)

DATE & TIME BEGAN: 11/02/92; 9:30am

DESCRIPTION OF WEATHER: Sunny & Windy 60°F

DRILLING TECHNIQUE:

Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
11/04/92	259.08
11/23/92	259.90

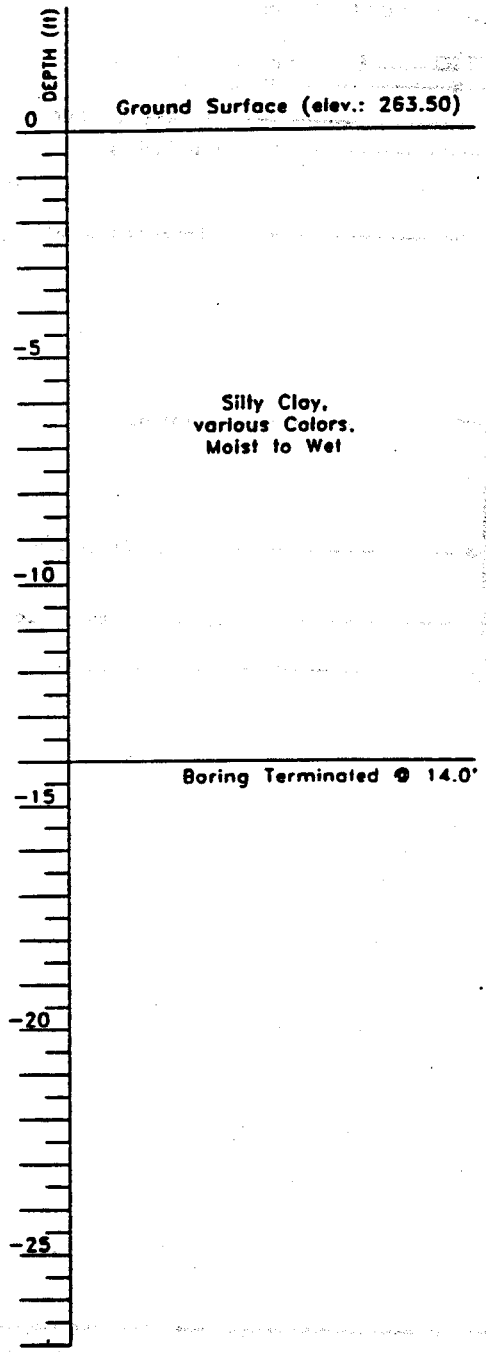
DRILLER: J. Rowland

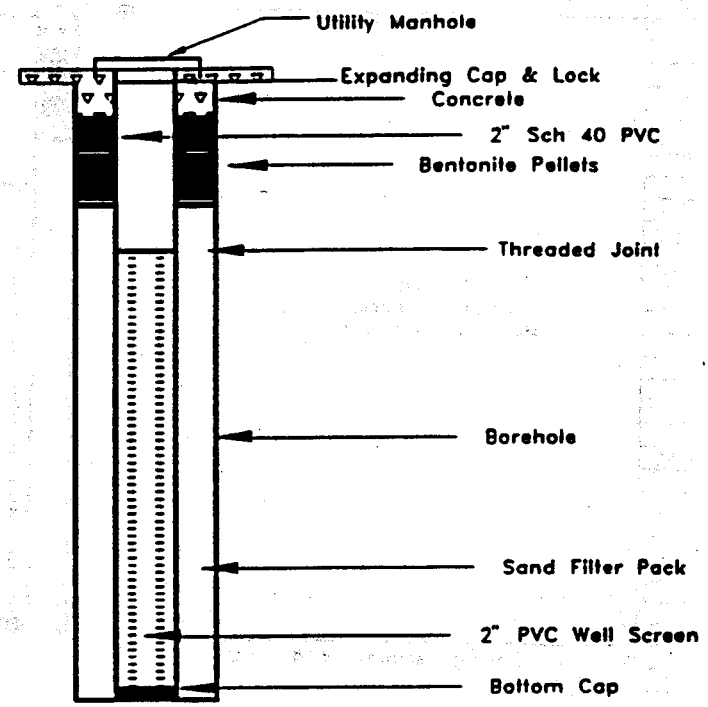
INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 14.0

DATE & TIME: 11/02/92 11:30am





MEMPHIS ENVIRONMENTAL CENTER, INC.

2003 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO. NASMW-1
DRAWN: DKD
DATE: NOVEMBER 23, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION MEMPHIS
BUILDING 362 TRAINING MOCK-UP AREA
MILLINGTON, TENNESSEE

CASING ELEVATION: 263.17

DATUM: Mean Sea Level

WELL LOCATION:

MW-3

(065MW03UA)

DATE & TIME BEGAN: 11/02/92; 12:30pm

DESCRIPTION OF WEATHER: Sunny & Windy 65°F

DRILLER: J. Rowland

INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 14.0

DATE & TIME: 11/02/92 2:00 pm

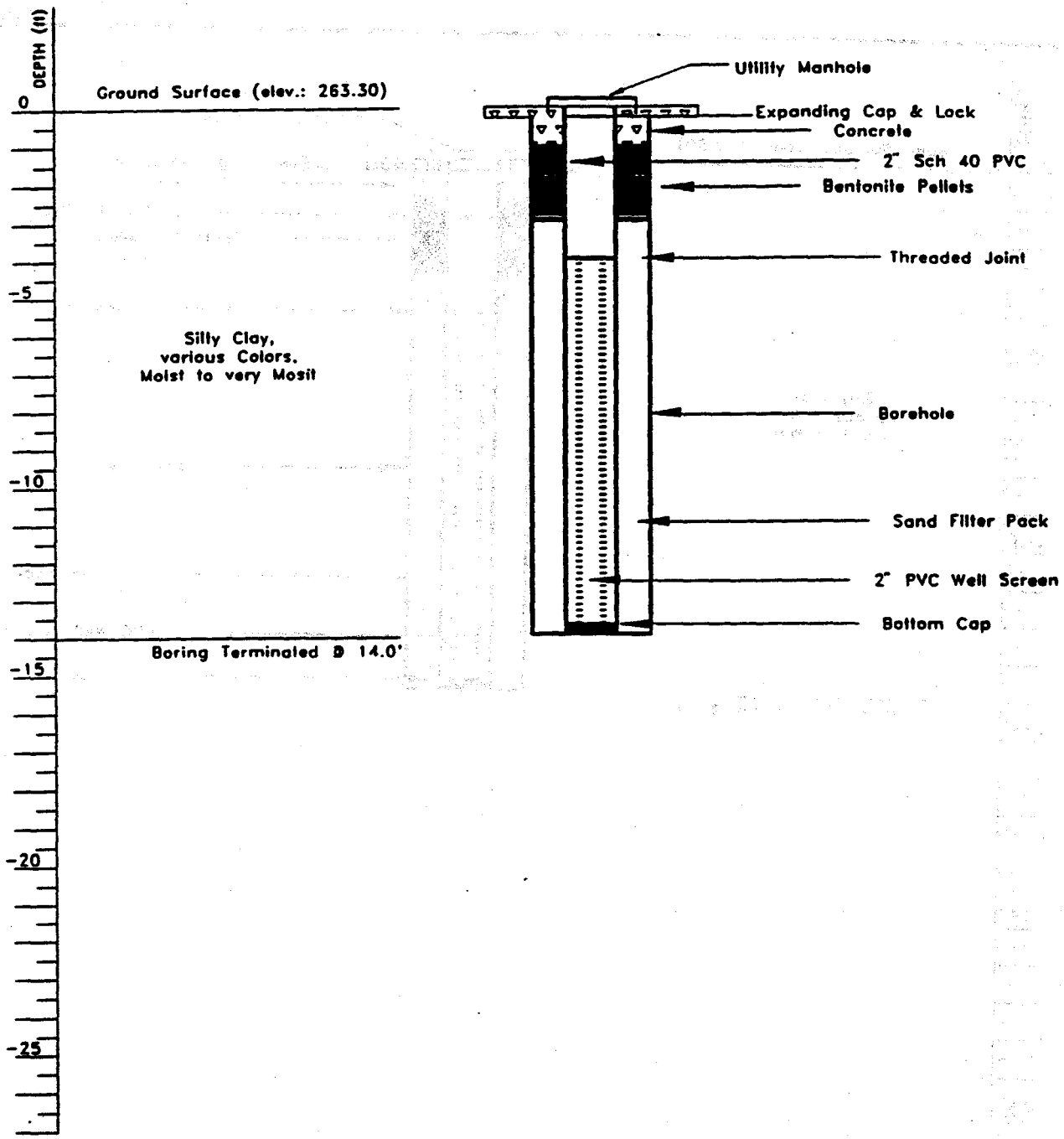
DRILLING TECHNIQUE:

Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
11/04/92	259.23
11/23/92	259.86



MEMPHIS ENVIRONMENTAL CENTER, INC.

2003 Corporate Avenue, Suite 100
Memphis, Tennessee 38122

DWG. NO. NASMW-3
DRAWN: DKD
DATE: NOVEMBER 23, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION MEMPHIS
BUILDING 362 TRAINING MOCK-UP AREA
MILLINGTON, TENNESSEE

CASING ELEVATION: 263.59

DATUM: Mean Sea Level

WELL LOCATION:

MW-4

(065MW04UA)

DATE & TIME BEGAN: 11/02/92; 2:30pm

DESCRIPTION OF WEATHER: Sunny & Windy 65°F

DRILLING TECHNIQUE:

Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
11/04/92	259.13
11/23/92	259.61

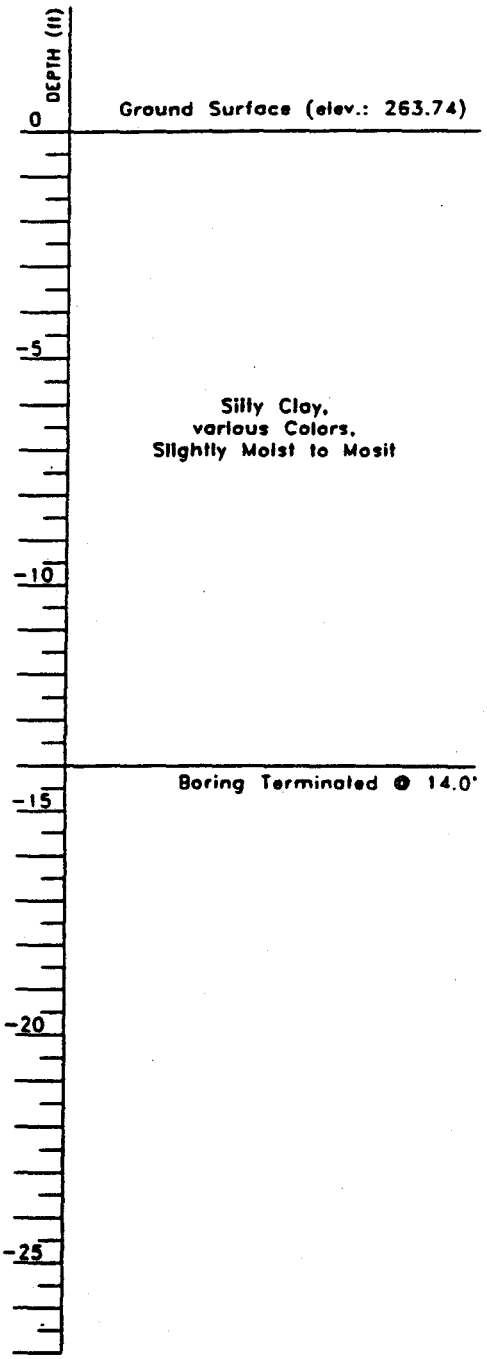
DRILLER: J. Rowland

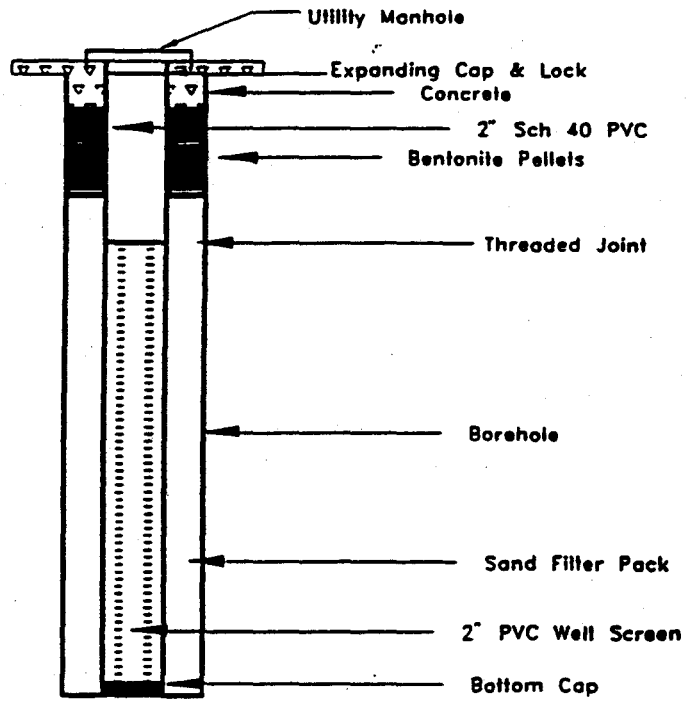
INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 14.0

DATE & TIME: 11/02/92 3:45pm





MEMPHIS ENVIRONMENTAL CENTER, INC.

2803 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO. NASMW-4
DRAWN: DKD
DATE: NOVEMBER 23, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION MEMPHIS
BUILDING 362 TRAINING MOCK-UP AREA
MILLINGTON, TENNESSEE

SWMU 66

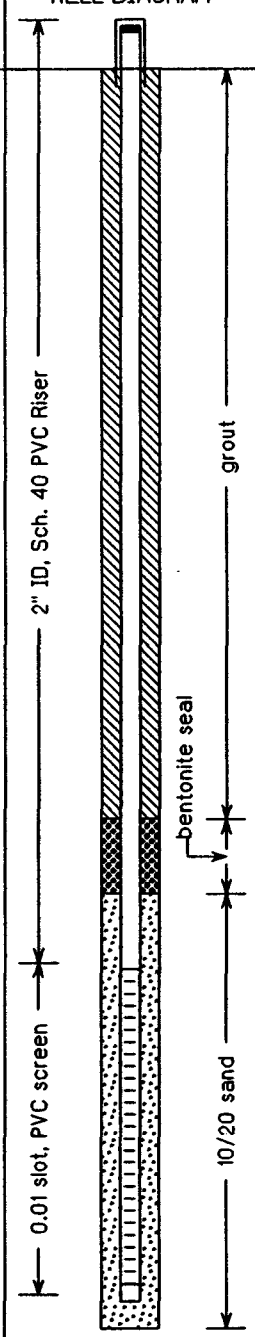
ENSAFE

Log of Monitoring Well 066G01F

Project: *NAS Memphis*	Location: *Millington, TN. SWMU#66*
Project No.: *N0094*	Surface Elevation: *feet msl*
Started at *1100 on 5-04-98*	TOC Elevation: *feet msl*
Completed at *1600 on 5-04-98*	Coordinates: Northing: Easting:
Drilling Method: *Hollow Stem Augers*	Groundwater Elevation:
Drilling Company: *Tri State Testing*	Total Depth: *37.2 feet*
Geologist: *Ben Brantley*	Well Screen: *27.2 to 37.2 feet*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
			1	100			ML	clayey Silt, light brown streaked w/ gray, moist	
5								same as above with scattered lignite grains and increased moisture	
			2	60				clayey Silt, yellowish brown streaked w/gray, stiffer and less moist, lignite grains scattered throughout sample	
10									
			3	100				same w/color change to gray with yellowish brown and orange (iron staining)	
15									
			4	100			CL	silty Clay, orange brown with 1/4 - 1/2 inch gravels scattered throughout sample, very stiff to hard.	
20								1/4 inch diameter iron-stained seam with water at 20 feet.	
			5	100					
25							GC	gravelly Sand and Clay, lignite from 25 to 27 feet.	
			6	100				clayey Sand and Gravel, yellow orange-tan, gravels up to 1 inch in diameter, with gray clay stringers (less than 1 inch in diameter), moist to wet between 23 and 28 feet, wet after 28 feet.	
30									
			7	75			SM	silty Sand, very fine, yellowish-orange, with 1/8 inch diameter clay stringers. Wet to 37 feet.	
35									
			8	90				sandy Silt, very fine, crimson red, and moist to dry (37.5 - 38 feet).	
40								End of boring at 38 feet.	

WELL DIAGRAM



PRODUCTION WELLS

PW-3

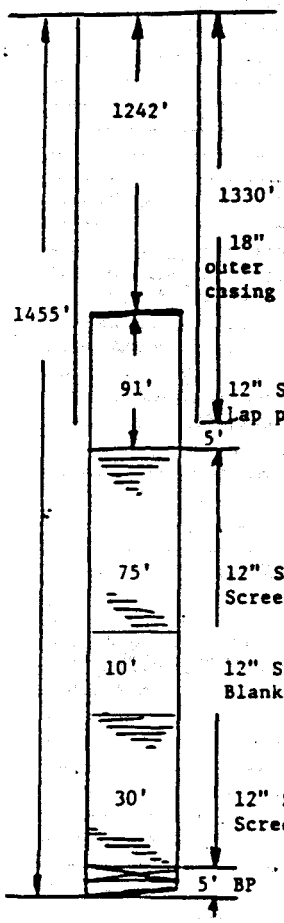
PW-4

PW-5

NOTE: LOGS FOR PWN-1 AND PWN-2 ARE NOT AVAILABLE

ALL MEASUREMENTS TAKEN FROM (GROUND) (TOP OF FOUNDATION) (TOP OF CASING) (TOP BASE PLATE)

DRAWING OF THE WELL



WELL DATA

STARTED WELL 05/06 19 85 AND COMPLETED 07/19 19 85
TOTAL DEPTH 1455' ELEVATION ____ STATIC WATER LEVEL 92'
LENGTH SURFACE CASING 108 SIZE 24" THICKNESS ____
CEMENTED WITH 100 SACKS CEMENT TYPE PACKER Welded
LENGTH WELL CASING 1330 SIZE 18" WEIGHT ____
CEMENTED WITH 1100 SACKS CEMENT TYPE PACKER Welded
INNER CASING LENGTH 90' SIZE 12" WEIGHT ____
WITH ____ x ____ GUIDES LOCATED ____ TYPE BACKOFF LH-Std.
LEAD SEAL None BACKPRESSURE VALVE Size 12 GUIDE ____
WELL STRAINER MAKE Johnson SIZE 12" LENGTH 105 OPENING .030
TYPE MATERIAL Wire wrapped WITH SS CONNECTIONS
SIZE HOLE DRILLED FOR SURFACE CASING ____ WITH ____
SIZE HOLE DRILLED FOR WELL CASING ____ WITH ____
SIZE HOLE DRILLED FOR STRAINER ____ WITH ____
YARDS OF GRAVEL USED 33 HOW PLACED Gravel 16-30
HOW WAS WELL DEVELOPED Air
NOTES: There is a 10' piece of SS blank from 1410 to 1420' between screen.
RIG USED G.D. DRILLER T. Lynwood Harbcock

PUMP RECORD

SERIAL NUMBER 103442 MAKE Layne FOUNDATION ____
LENGTH COLUMN 150' SIZE 10" x 2" x 1-3/16" TYPE O.L. @ 10/30 LENGTHS
BOWL SIZE 12" TYPE RKBH STAGES 3 MATERIAL IMPELLER Bronze
MATERIAL BOWL Bronze WITH open PORTS AND ____ SHAFT
SUCTION SIZE 10" LENGTH 20' SUCTION STRAINER No
IS PUMP SEALED HOW No. WHERE ____ WITH WHAT ____
LUBRICATOR TYPE Essex #8 SIZE 2 Quart VOLTAGE 460
LENGTH OF AIRLINE 151 SIZE 1/4 TYPE MATERIAL Copper
AIR RELEASE VALVE TYPE Crispin SIZE 2" D-20
SIZE SURFACE DISCHARGE 10" TYPE flanged BAYTON COUPLING Yes
PRESSURE GUAGE ____ SPEED ____
NOTES Total setting 174'5". Screwed column
Static level 95'
RIG USED TO SET PUMP ____ INSTALLER Garry Corter
DATE PUMP INSTALLED 02/07 1986 DATE IN OPERATION ____ 19 ____

MOTOR

MAKE U.S. HP 75 FRAME 365TP PHASE 3 CYCLE 60 VOLT. 220/440 460V
SPEED 1770 MODEL RU SERIAL NUMBER 9600484-303
TOP BEARING ____ BOTTOM BEARING ____ RATCHET Non-reverse
STARTER ____ PRESSURE SWITCH ____ FLOAT ____

GEAR

MAKE Amarillo MODEL C80 SIZE ____ RATIO 1 NO 1
SIZE PULLEY ____ TYPE MOTOR FRAME Serial No. 155842

ENGINE

MAKE Rockford MODEL ____ HP 80 SERIAL NUMBER 692629
SPEED ____ SIZE PULLEY ____ FOUNDATION ____
TYPE FUEL TANK Diesel MAKE MAG ____ NO ____
MAKE STARTER ____ NO ____ TYPE FUEL ____
MAKE FLEXIBLE SHAFT ____ SIZE ____ LENGTH ____ BELT LENGTH ____

GENERAL

PURPOSE FOR WHICH THIS WATER IS USED ____
TEMPERATURE ____ IS WATER CLEAR ____ CAPACITY ____
SAND ____ HARDNESS ____ PH ____ IRON ____ NaCl ____
TYPE TREATMENT USED ____
IS THERE A DERRICK OVER THE WELL ____ HEIGHT ____ TYPE ____
CAN TRUCK OR RIG EASILY GET TO WELL ____
PUMP HOUSE ____ SIZE HATCH ____

CONTRACT NO. ME - 1917

OUR WELL NO. ____ THEIR WELL NO. 3 IN TEST HOLE NO. 1

LOCATION OF THE WELL Naval Air Station, Millington, TN

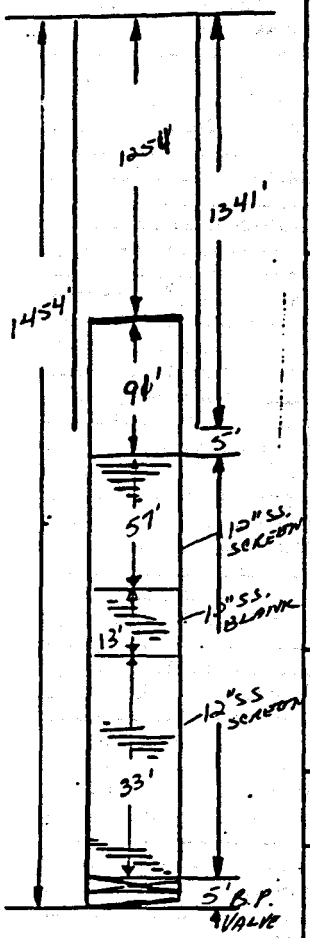
INSTALLED FOR Naval Air Station

ADDRESS CITY Millington COUNTY Shelby STATE TN

YEAR 1985

ALL MEASUREMENTS TAKEN FROM ~~(FOUNDATION, TOP OF CASING, TOP BASE PLATE)~~ Top of Casing.

DRAWING OF THE WELL



WELL DATA

STARTED WELL 09/11 19 85 AND COMPLETED 10/18 19 85
TOTAL DEPTH 1454 ELEVATION STATIC WATER LEVEL 68'
LENGTH SURFACE CASING 68' SIZE 24" THICKNESS
CEMENTED WITH 100 SACKS CEMENT TYPE PACKER
LENGTH WELL CASING 1341' SIZE 18" WEIGHT
CEMENTED WITH 1100 SACKS CEMENT TYPE PACKER Welded
INNER CASING LENGTH 90' SIZE 12" WEIGHT
WITH x GUIDES LOCATED top & bottom TYPE BACKOFF LH-STD
LEAD SEAL BACKPRESSURE VALVE 12" GUIDE
WELL STRAINER MAKE Layne SIZE 12" LENGTH 90' OPENING .030
TYPE MATERIAL S.S. WITH wire wrapped CONNECTIONS
SIZE HOLE DRILLED FOR SURFACE CASING WITH
SIZE HOLE DRILLED FOR WELL CASING WITH
SIZE HOLE DRILLED FOR STRAINER WITH
YARDS OF GRAVEL USED 31 HOW PLACED gravel line
HOW WAS WELL DEVELOPED Air
NOTES
RIG USED G.D. DRILLER T. Lynwood Hathcock

PUMP RECORD

SERIAL NUMBER 103443 MAKE Layne FOUNDATION
LENGTH COLUMN 140' SIZE 10x2x1-3/16" TYPE oil @ 10/120 LENGTHS
BOWL SIZE 12 TYPE RKBM STAGES 3 MATERIAL IMPELLER Bronze
MATERIAL BOWL Bronze WITH open PORTS AND SHAFT
SUCTION SIZE 10" LENGTH 20' SUCTION STRAINER No
IS PUMP SEALED HOW No. WHERE WITH WHAT
LUBRICATOR TYPE Essex SIZE #8 VOLTAGE 460
LENGTH OF AIRLINE 141 SIZE 1/4" TYPE MATERIAL Copper
AIR RELEASE VALVE TYPE Crispin D-20 SIZE 2"
SIZE SURFACE DISCHARGE 10" TYPE flanged DAYTON COUPLING Yes
PRESSURE GUAGE SPEED
NOTES 900 GPM
Static Level 71'
RIG USED TO SET PUMP INSTALLER Garry Correr
DATE PUMP INSTALLED 02 19 86 DATE IN OPERATION 19

MOTOR

MAKE U.S. HP 75 FRAME 365TP PHASE 3 CYCLE 60 VOLT 220/440 480V
SPEED 1770 MODEL RU SERIAL NUMBER N02L11400B9R-1
TOP BEARING BOTTOM BEARING RATCHET Non-reverse
STARTER PRESSURE SWITCH FLOAT

GEAR

MAKE MODEL SIZE RATIO NO
SIZE PULLEY TYPE MOTOR FRAME

ENGINE

MAKE MODEL HP SERIAL NUMBER
SPEED SIZE PULLEY FOUNDATION
TYPE FUEL TANK MAKE MAG NO
MAKE STARTER NO TYPE FUEL
MAKE FLEXIBLE SHAFT SIZE LENGTH BELT LENGTH

GENERAL

PURPOSE FOR WHICH THIS WATER IS USED
TEMPERATURE IS WATER CLEAR CAPACITY
SAND HARDNESS PH IRON NaCL
TYPE TREATMENT USED
IS THERE A DERRICK OVER THE WELL HEIGHT TYPE
CAN TRUCK OR RIG EASILY GET TO WELL
PUMP HOUSE SIZE HATCH

CONTRACT NO. ME 1917-

OUR WELL NO THEIR WELL NO. 4 IN TEST HOLE NO

LOCATION OF THE WELL Naval Air Station, Millington, TN

INSTALLED FOR Naval Air Station

ADDRESS CITY Millington COUNTY Shelby STATE TN

YEAR 1985

FORMATION LOG OF THE WELL OR TEST HOLE

STARTED TEST HOLE 09/20 19 85 FINISHED _____ 19 ____ TEST HOLE NUMBER 4

LOCATION NAS, Memphis, Millington, TN SEC _____ TS _____ RANGE _____ ELEVATION _____

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
0- 40		Clay
40- 66		Sand & Gravel
66- 137		Clay
137- 138		Rock
138- 174		Clay
174- 220		Sand & clay streaks
220- 250		Clay
250- 265		Sandy clay
265- 320		Fine sand & clay streaks
320- 336		Medium sand & clay streaks
336- 391		Sandy clay
391- 430		Sandy clay
430- 461		Hard clay
461- 537		Medium coarse sand & clay sts
537- 564		Hard sandy clay
564- 725		Fine sand & clay streaks lignite
725- 837		Fine sand & clay streaks lignite
837- 863		Hard sandy clay
863- 875		Hard clay & sand streaks
875- 961		Fine sand & clay streaks lignite.
961-1038		Med. sand & clay streaks lig.
1038-1051		Fine sand & clay streaks
1051-1069		Hard sandy clay & lignite
1069-1091		Hard sandy clay & lignite & rock streaks
1091-1092		Rock
1092-1132		Hard clay & rock streaks lig.
1132-1290		Hard sandy clay, lignite & rock streaks
1290-1365		Sandy clay
1365-1429		Fine sand & clay streaks
1429-1434		Sandy clay
1434-1454		Fine sand & clay streaks, lig.
1454-1460		Sand & clay streaks
1460-		Hard sandy clay
SAMPLES:		
1)1365-1370		5)1385-1390 9)1405-1410
2)1370-1375		6)1390-1395 10)1410-1415
3)1375-1380		7)1395-1400 11)1415-1420
4)1380-1385		8)1400-1405 12)1420-1425

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
13)1425-1430		
14)1430-1435		
15)1435-1440		
16)1440-1445		
17)1445-1450		
18)1450-1455		

MUD PIT SIZE _____ FT. X _____ FT. _____ X _____ FT. DEEP

TYPE BIT USED TO CUT SAND _____

SIZE OF TEST HOLE THROUGH SAND _____

TYPE OF BIT USED TO CUT UPPER FORMATIONS _____

_____ SIZE _____

TYPE MUD PUMP USED _____

DRILLING PRESSURE IN SAND _____

TYPE OF MUD USED _____

NOTES: _____

TEST DATA

	PRELIMINARY TEST	FINAL TEST
STATIC WATER LEVEL	68	
PUMPED G. P. M.	330	
PRESSURE, POUNDS	0	
DRAWDOWN	11	
G. P. F. D.	30	
GUARANTEED G. P. M.		
GUARANTEED PRESSURE		
DATE OF TEST	10/18/85	

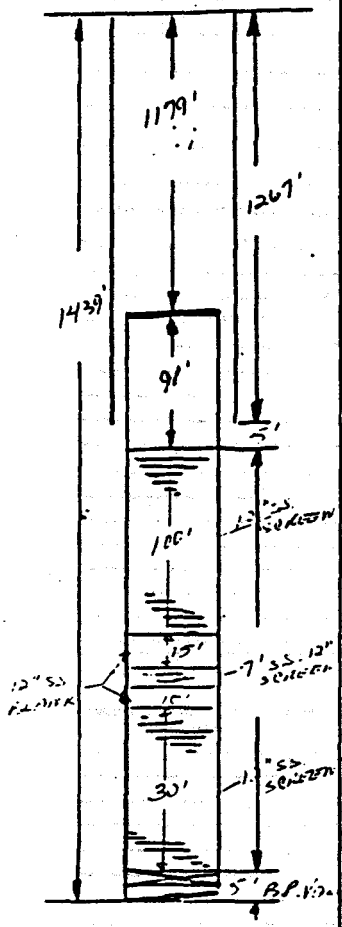
REMARKS

DRILLER T. Lynwood Hathcock

FIELD SUP'T Merrill Chrestman

ALL MEASUREMENTS TAKEN FROM ~~(GROUND LEVEL OF FOUNDATION)~~ (TOP OF CASING) ~~(TOP OF FLANGE)~~

DRAWING OF THE WELL



WELL DATA

STARTED WELL 07/22 19 85 AND COMPLETED 09/06 19 85
TOTAL DEPTH 1439' ELEVATION _____ STATIC WATER LEVEL 65'
LENGTH SURFACE CASING 96' SIZE 24" THICKNESS _____
CEMENTED WITH 100 SACKS CEMENT TYPE PACKER _____
LENGTH WELL CASING 1267' SIZE 18" WEIGHT _____
CEMENTED WITH 1100 SACKS CEMENT TYPE PACKER _____
INNER CASING LENGTH 91' SIZE 12" WEIGHT _____
WITH x GUIDES LOCATED top&bottom TYPE BACKOFF LH-std
LEAD SEAL Yes BACKPRESSURE VALVE 12" GUIDE _____
WELL STRAINER MAKE Layne WW SIZE 12" LENGTH 137' OPENING .030
TYPE MATERIAL SS WITH _____ CONNECTIONS _____
SIZE HOLE DRILLED FOR SURFACE CASING _____ WITH _____
SIZE HOLE DRILLED FOR WELL CASING _____ WITH _____
SIZE HOLE DRILLED FOR STRAINER _____ WITH _____
YARDS OF GRAVEL USED 53 HOW PLACED Gravel line
HOW WAS WELL DEVELOPED Air
NOTES _____
RIG USED G.D. DRILLER T. Lynwood Hathcock

PUMP RECORD

SERIAL NUMBER 103444 MAKE Layne FOUNDATION _____
LENGTH COLUMN _____ SIZE 10"x2"x1-3/16" TYPE TF1018 10 20 LENGTHS
BOWL SIZE 13 TYPE CL STAGES 3 MATERIAL IMPELLER Bronze
MATERIAL BOWL Bronze WITH open PORTS AND _____ SHAFT
SUCTION SIZE 10" LENGTH 20' SUCTION STRAINER No
IS PUMP SEALED HOW No WHERE _____ WITH WHAT _____
LUBRICATOR TYPE Essex SIZE #8 VOLTAGE 460
LENGTH OF AIRLINE 131' SIZE 1/4 TYPE MATERIAL Copper
AIR RELEASE VALVE TYPE Crispin D-20 SIZE 2"
SIZE SURFACE DISCHARGE 10" TYPE flanged DAYTON COUPLING Yes
PRESSURE GUAGE _____ SPEED _____
NOTES 1400 GPM
RIG USED TO SET PUMP _____ INSTALLER Garry Corter
DATE PUMP INSTALLED 02/21/ 19 86 DATE IN OPERATION _____ 19 _____

MOTOR

MAKE U.S. HP 100 FRAME 404TP PHASE 3 CYCLE 60 VOLT 220/440 460
SPEED 1760 MODEL RV SERIAL NUMBER A12L114009881
TOP BEARING _____ BOTTOM BEARING _____ RATCHET Non-reverse
STARTER _____ PRESSURE SWITCH _____ FLOAT _____

GEAR

MAKE Amarillo MODEL C-100 SIZE _____ RATIO 1 NO 1
SIZE PULLEY _____ TYPE MOTOR FRAME Serial No. 155846

ENGINE

MAKE Rockford MODEL _____ HP 80 SERIAL NUMBER 692629
SPEED _____ SIZE PULLEY _____ FOUNDATION _____
TYPE FUEL TANK _____ MAKE MAG _____ NO _____
MAKE STARTER _____ NO _____ TYPE FUEL _____
MAKE FLEXIBLE SHAFT _____ SIZE _____ LENGTH _____ BELT LENGTH _____

GENERAL

PURPOSE FOR WHICH THIS WATER IS USED _____
TEMPERATURE _____ IS WATER CLEAR _____ CAPACITY _____
SAND _____ HARDNESS _____ PH _____ IRON _____ NaCL _____
TYPE TREATMENT USED _____
IS THERE A DERRICK OVER THE WELL _____ HEIGHT _____ TYPE _____
CAN TRUCK OR RIG EASILY GET TO WELL _____
PUMP HOUSE _____ SIZE HATCH _____

CONTRACT NO. ME 1917 - _____

OUR WELL NO. _____ THEIR WELL NO. 5 IN TEST HOLE NO. 1

LOCATION OF THE WELL Millington, TN

INSTALLED FOR Naval Air Station

ADDRESS CITY Memphis COUNTY Shelby STATE TN

YEAR 1985

FORMATION LOG OF THE WELL OR TEST HOLE

STARTED TEST HOLE 08/01 19 85 FINISHED _____ 19 ____ TEST HOLE NUMBER 5

LOCATION NAS, Memphis SEC ____ TS ____ RANGE ____ ELEVATION ____

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
0- 35		Clay
35- 96		Sand gravel & rock streak
96- 140		Clay
140- 160		Sandy clay & sand streak
160- 206		Sand & clay streaks
206- 289		Hard clay & sandy clay streaks
289- 545		Med. sand & clay streak lignite
545- 550		Clay
550- 633		Med. sand & clay streak lignite
633- 817		Med. fine sand & clay streak
817- 893		Hard sandy clay
893- 945		Med. Coarse sand & clay streaks & lignite
945-1030		Fine sand & clay streak & lig.
1030-1154		Hard sandy clay & lignite
1154-1164		Sandy clay streaks
1164-1265		Hard sand clay & lignite
1265-1348		Fine sand & clay streaks & lignite
1348-1354		Clay & sand streaks
1354-1375		Fine sand & clay streaks lignite
1375-1380		Clay & sand streaks
1380-1385		Fine sand & clay streaks & lig.
1385-1423		Sand & clay streaks ½ x ½
1423-1440		Fine sand & clay streaks & lig.
1440-1453		Clay
1453-1473		Sandy clay & sand streaks
1473-1542		Clay

Samples:

1-1265-1270	12-1320-1325
2-1270-1275	13-1325-1330
3-1275-1280	14-1330-1335
4-1280-1285	15-1335-1340
5-1285-1290	16-1340-1345
6-1290-1295	17-1345-1350
7-1295-1300	18-1350-1355
8-1300-1305	19-1355-1360
9-1305-1310	20-1360-1365
10-1310-1315	21-1365-1370
11-1315-1320	22-1370-1375

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
23-1375-	1380	31-1415-1420
24-1380-	1385	32-1420-1425
25-1385-	1390	33-1425-1430
26-1390-	1395	34-1430-1435
27-1395-	1400	35-1435-1440
28-1400-	1405	
29-1405-	1410	
30-1410-	1415	

MUD PIT SIZE ____ FT. X ____ FT. X ____ FT. DEEP

TYPE BIT USED TO CUT SAND ____

SIZE OF TEST HOLE THROUGH SAND ____

TYPE OF BIT USED TO CUT UPPER FORMATIONS ____

____ SIZE ____

TYPE MUD PUMP USED ____

DRILLING PRESSURE IN SAND ____

TYPE OF MUD USED ____

NOTES: ____

TEST DATA

	PRELIMINARY TEST	FINAL TEST
STATIC WATER LEVEL	65	
PUMPED G. P. M.	300±	
PRESSURE. POUNDS	0	
DRAWDOWN	6	
G. P. F. D.	50	
GUARANTEED G. P. M.		
GUARANTEED PRESSURE		
DATE OF TEST	09/06/85	

REMARKS

DRILLER T. Lynwood Hathcock

FIELD SUP'T Merrill Chrestman

Navy Flying Club
Well and Boring Logs

UST Investigation
EnSafe/Allen & Hoshall

Leak Detection Wells
T1205

WELL CONSTRUCTION LOG. FC-MW-1

NAS MEMPHIS UST EAR

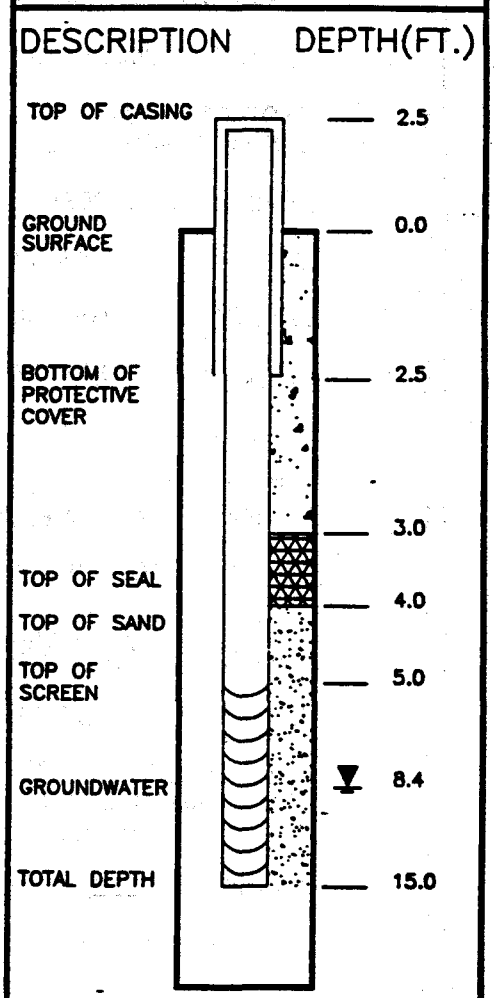
WELL LOCATION FLYING CLUB

DATE INSTALLED 11 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 285.1
   a) DEPTH TO SATURATED ZONE 8.4 FEET
3. TOP OF CASING ELEV. 300.06
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 10.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 15.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 15.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 374 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS UPGRADIENT WELL

INSTALLATION DESCRIPTION



JOB NUMBER 067-C01014

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

FIGURE
WELL CONSTRUCTION LOG

DATE: 08/05/93 | DWG NAME: 067FWC1

WELL CONSTRUCTION LOG. FC-MW-2

NAS MEMPHIS UST EAR

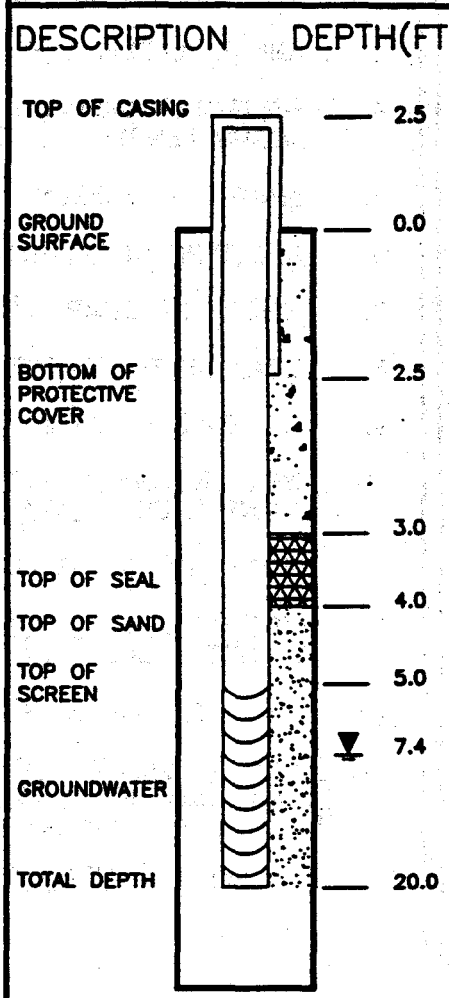
WELL LOCATION FLYING CLUB

DATE INSTALLED 12 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 283.16
   a) DEPTH TO SATURATED ZONE 7.4 FEET
3. TOP OF CASING ELEV. 297.53
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS

INSTALLATION DESCRIPTION



JOB NUMBER 067-C01014

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

FIGURE
WELL CONSTRUCTION LOG

DATE: 08/05/93 | DWG NAME: 067FWC2

WELL CONSTRUCTION LOG. FC-MW-3

NAS MEMPHIS UST EAR

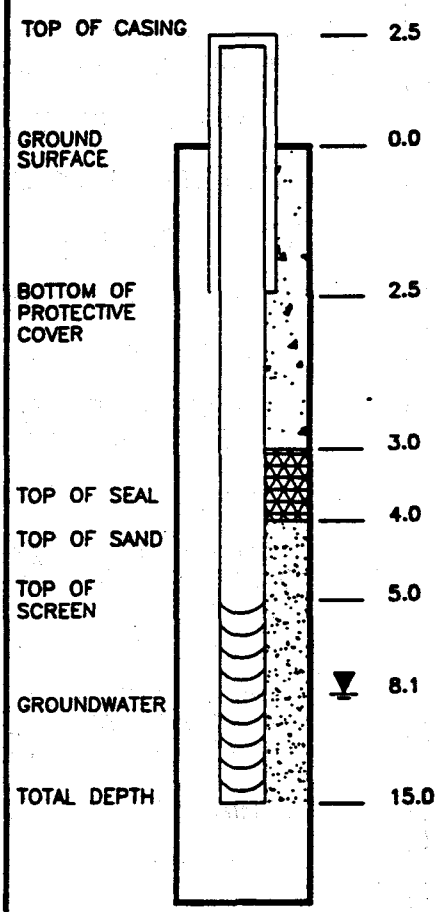
WELL LOCATION FLYING CLUB

DATE INSTALLED 12 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 280.86
   a) DEPTH TO SATURATED ZONE 8.1 FEET
3. TOP OF CASING ELEV. 297.53
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS

INSTALLATION DESCRIPTION



JOB NUMBER 067-C01014

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

FIGURE
WELL CONSTRUCTION LOG

DATE: 08/05/93 | DWG NAME: 067FWC3

WELL CONSTRUCTION LOG. FC-MW-4

NAS MEMPHIS UST EAR

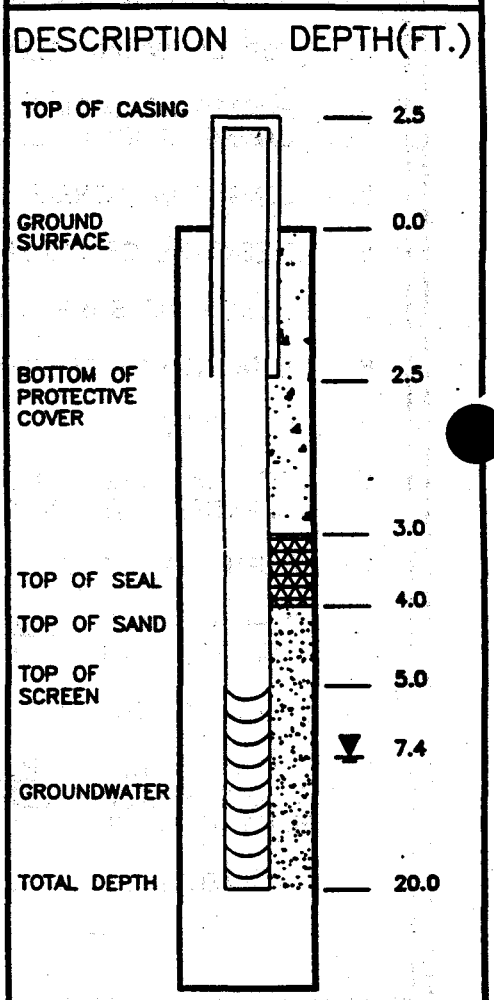
WELL LOCATION FLYING CLUB

DATE INSTALLED 12 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 283.5
   a) DEPTH TO SATURATED ZONE 8.6 FEET
3. TOP OF CASING ELEV. 297.89
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS

INSTALLATION DESCRIPTION



JOB NUMBER 067-C01014

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

FIGURE
WELL CONSTRUCTION LOG

DATE: 08/05/93 | DWG NAME: 067FWC4

WELL CONSTRUCTION LOG. FC-MW-5

NAS MEMPHIS UST EAR

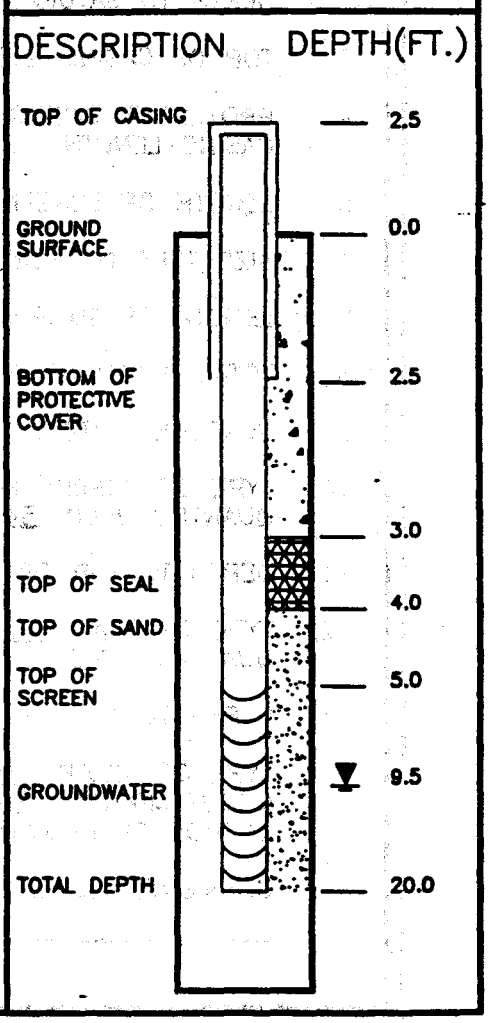
WELL LOCATION FLYING CLUB

DATE INSTALLED 11 MAY 93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 283.76
   a) DEPTH TO SATURATED ZONE 9.5 FEET
3. TOP OF CASING ELEV. 298.23
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS

INSTALLATION DESCRIPTION



JOB NUMBER 067-C01014

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

FIGURE
WELL CONSTRUCTION LOG

DATE: 08/05/93 | DWG NAME: 067FWC5

WELL CONSTRUCTION LOG. FC-MW-6

NAS MEMPHIS UST EAR

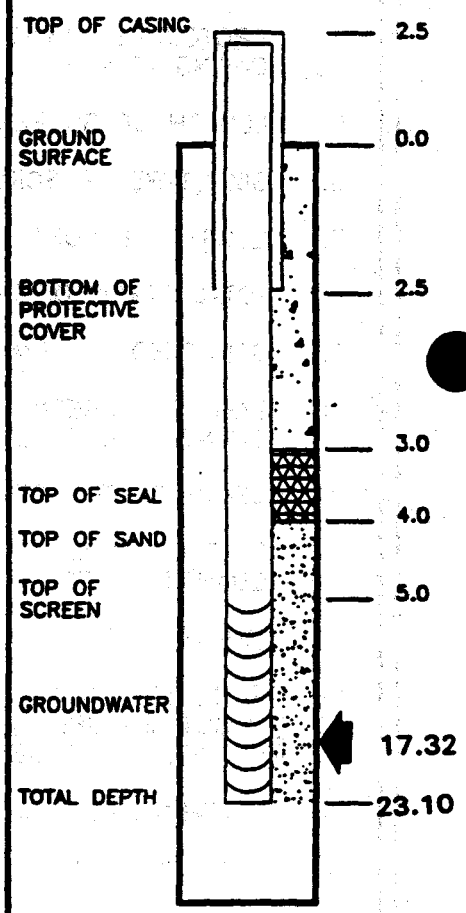
WELL LOCATION FLYING CLUB

DATE INSTALLED 7/15/93

TYPE OF WELL 2 INCH ID SCH 40 PVC

1. HEIGHT OF CASING ABOVE GROUND 2.50 FEET
2. WATER SURFACE ELEV. 278.33 (7/20/93)
   a) DEPTH TO SATURATED ZONE N/A
3. TOP OF CASING ELEV. 295.65
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0 FEET
6. SIZE\TYPE OF SCREEN 0.010 INCH SLOTTED PVC
7. LENGTH OF SUMP N/A
8. TOTAL DEPTH OF BORING 20.0 HOLE DIAMETER 8.25
9. SCREENED INTERVAL 5.0 FEET TO 20.0 FEET
10. TYPE OF SCREEN FILTER PACK SILICA SAND
    QUANTITY USED 544 lbs. SIZE 20/40 U/C
11. DEPTH TO TOP OF FILTER 4.0 FEET
12. TYPE OF SEAL 1/4 INCH BENTONITE PELLETS
    QUANTITY USED 26 lbs
13. DEPTH TO TOP OF SEAL 3.0 FEET
14. TYPE OF GROUT PORTLAND CEMENT
    GROUT MIXTURE 93% CEMENT 7% BENTONITE BY WT.
    METHOD OF PLACEMENT PRESSURIZED HOSE
15. COMMENTS

INSTALLATION DESCRIPTION



JOB NUMBER NOO67C0104

ENVIRONMENTAL ASSESSMENT PLAN
NAS MEMPHIS
CTO-67

FIGURE
WELL CONSTRUCTION LOG

DATE: 08/05/93 | DWG NAME: 067FWC5

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING

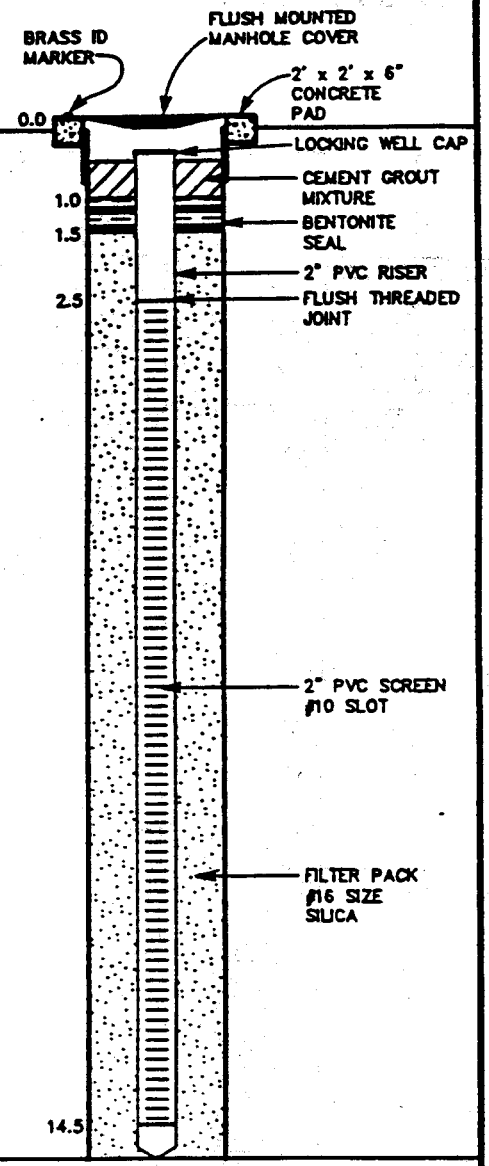
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1205N, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1205N-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, BROWN, MOIST
5			
			8.0
			9.3 24 HOUR WATER LEVEL
10			SILT, CLAYEY, BROWN, WET
			14.0
			SILT, CLAYEY, BROWN, WET STRONG HYDROCARBON ODOR
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 4, 1990
Boring Diameter: 6.75"
Well Completion Date: JAN. 4, 1990
Ground Elevation: 296.79'
Well Development Date: N.A.
Top of Casing Elevation:
Drilling Method: POWER AUGER
Driller: B. ELDER
Depth to Water: 9.3'
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

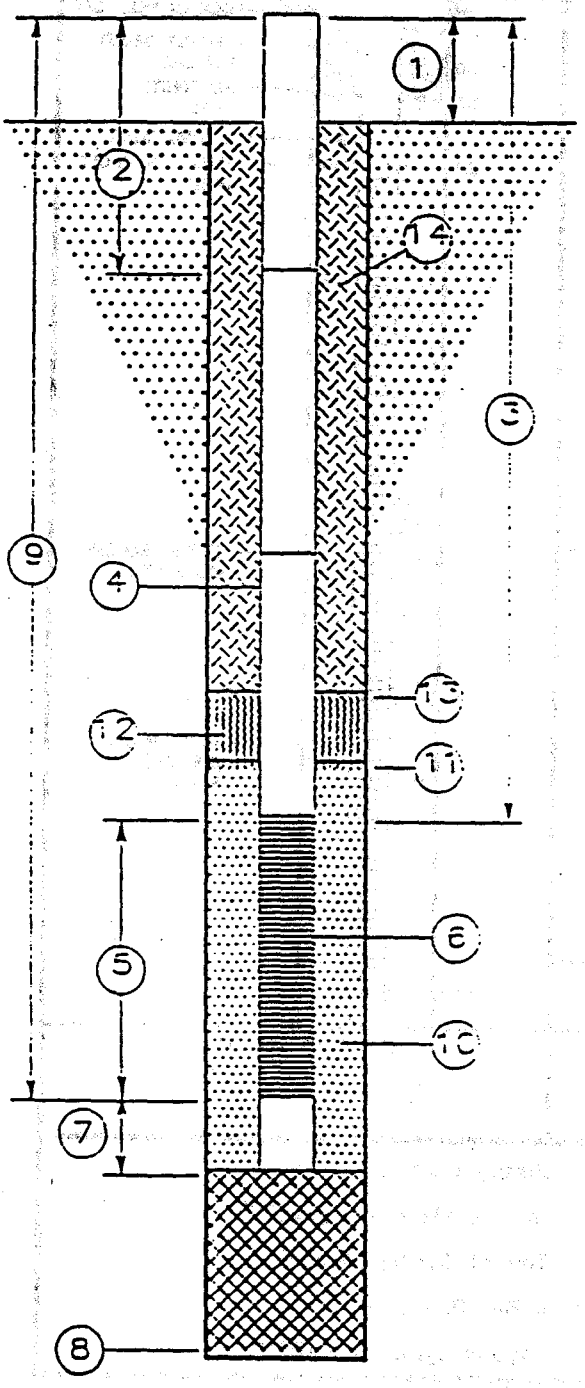
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1205N-1

DATE OF INSTALLATION 1-4-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC [illegible] slot
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter [illegible]
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size [illegible] U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING

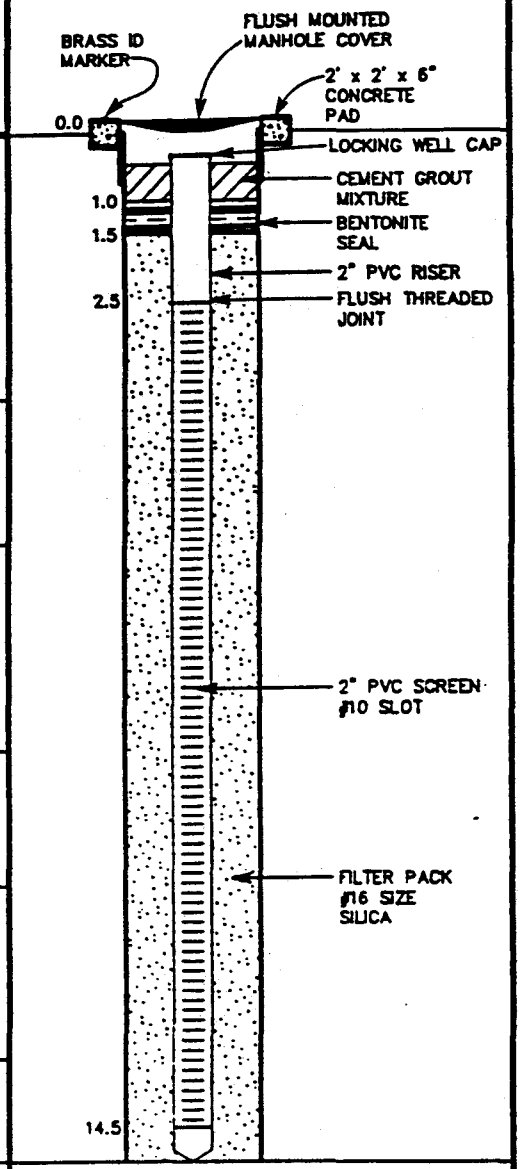
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1205N, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 - LOG OF WELL NO. MEM-T1205N-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, BROWN, MOIST
			4.0
5			SILT, CLAYEY, BROWN, WET
			6.0
			SILT, CLAYEY, GRAY, WET
			9.0
10			SILT, CLAYEY, BROWN, WET
			10.5 24 HOUR WATER LEVEL
			11.0
			SILT, CLAYEY, BROWN, WET SLIGHT HYDROCARBON ODOR
			13.5
			SILT, CLAYEY, BROWN, WET MODERATE HYDROCARBON ODOR
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 4, 1990 — Boring Diameter: 6.75"

Well Completion Date: JAN. 4, 1990 — Ground Elevation: 297.20'

Well Development Date: N.A. — Top of Casing Elevation:

Drilling Method: POWER AUGER — Driller: B. ELDER

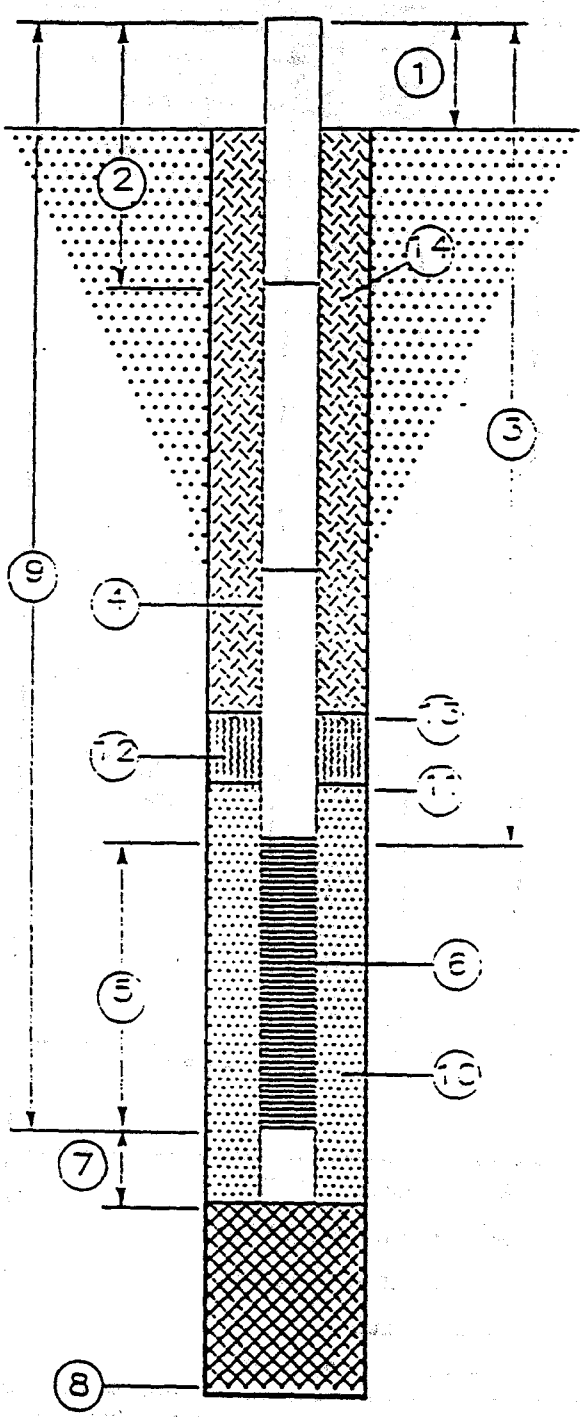
Depth to Water: 10.5' — Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1205N-2

DATE OF INSTALLATION 1-4-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft.
   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC [illegible]" slot
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inc
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 [illegible]
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING

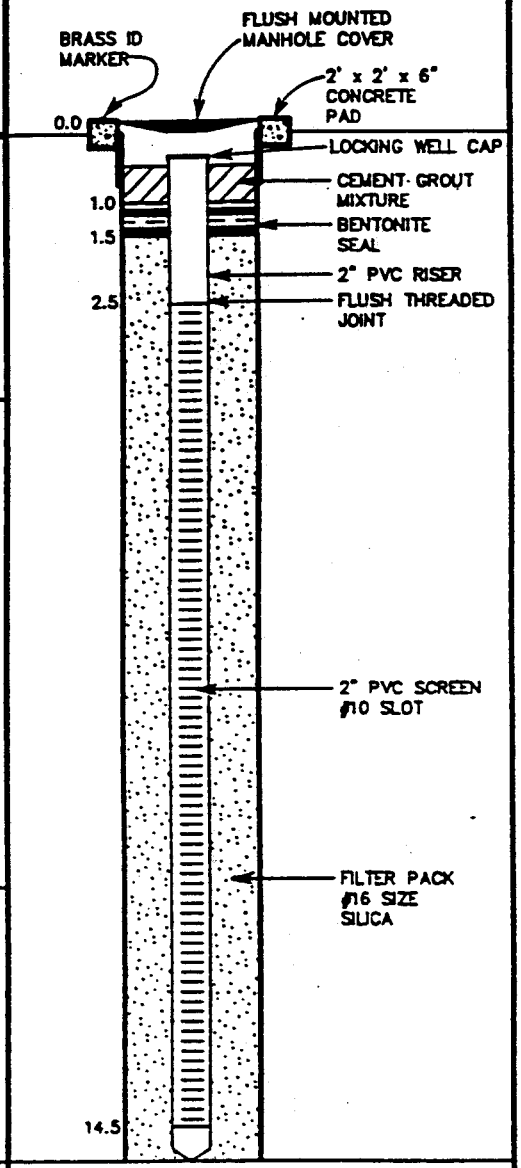
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1205S, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1205S-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, BROWN, MOIST
			4.0
5			SILT, CLAYEY, BROWN, WET
10			10.7 24 HOUR WATER LEVEL
			11.0
			SILT, CLAYEY, BROWN, WET SLIGHT HYDROCARBON ODOR
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 4, 1990
Well Completion Date: JAN. 4, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 10.7'

Boring Diameter: 6.75"
Ground Elevation: 296.13'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

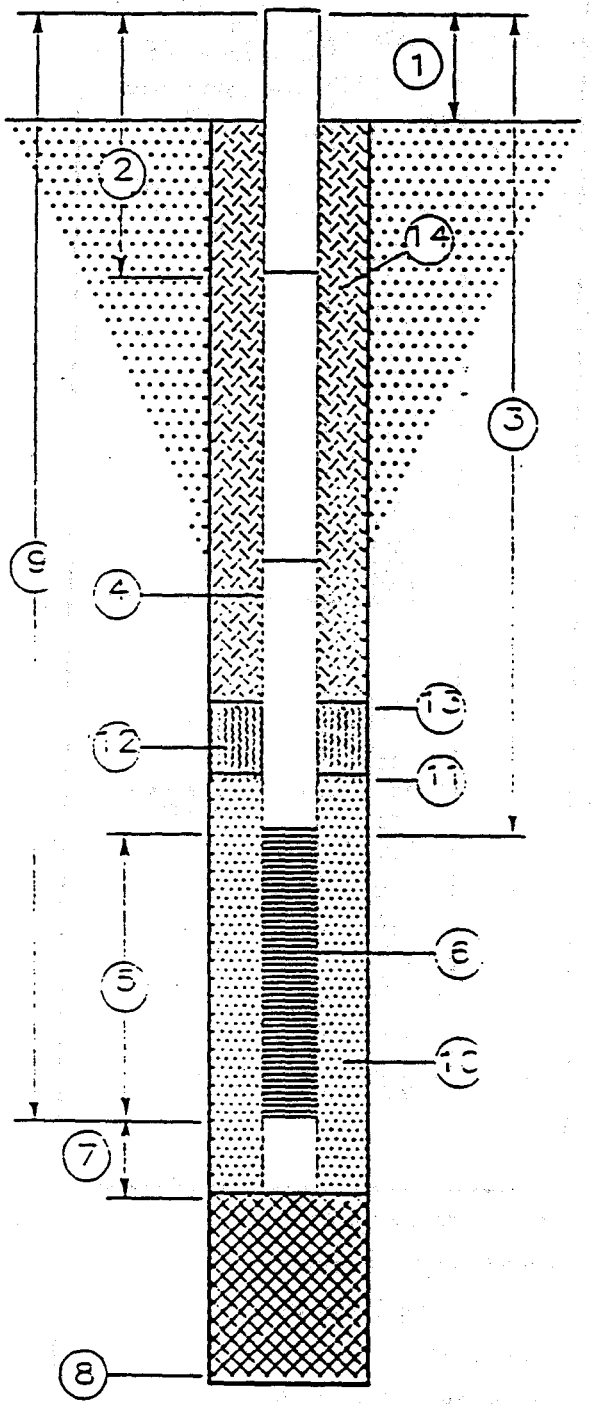
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1205S-1

DATE OF INSTALLATION 1/4/90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

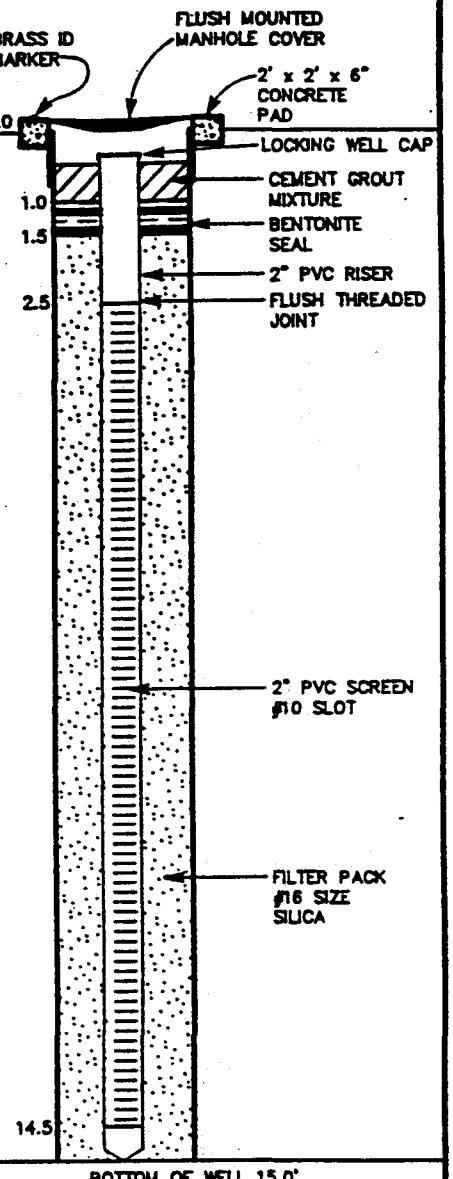
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1205 S2, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1205S-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY BROWN, MOIST
			4.0
5			
			SILT, CLAYEY, BROWN, WET
10			
			11.0 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 4, 1990
Well Completion Date: JAN. 4, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 11.0'

Boring Diameter: 6.75"
Ground Elevation: 296.86'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

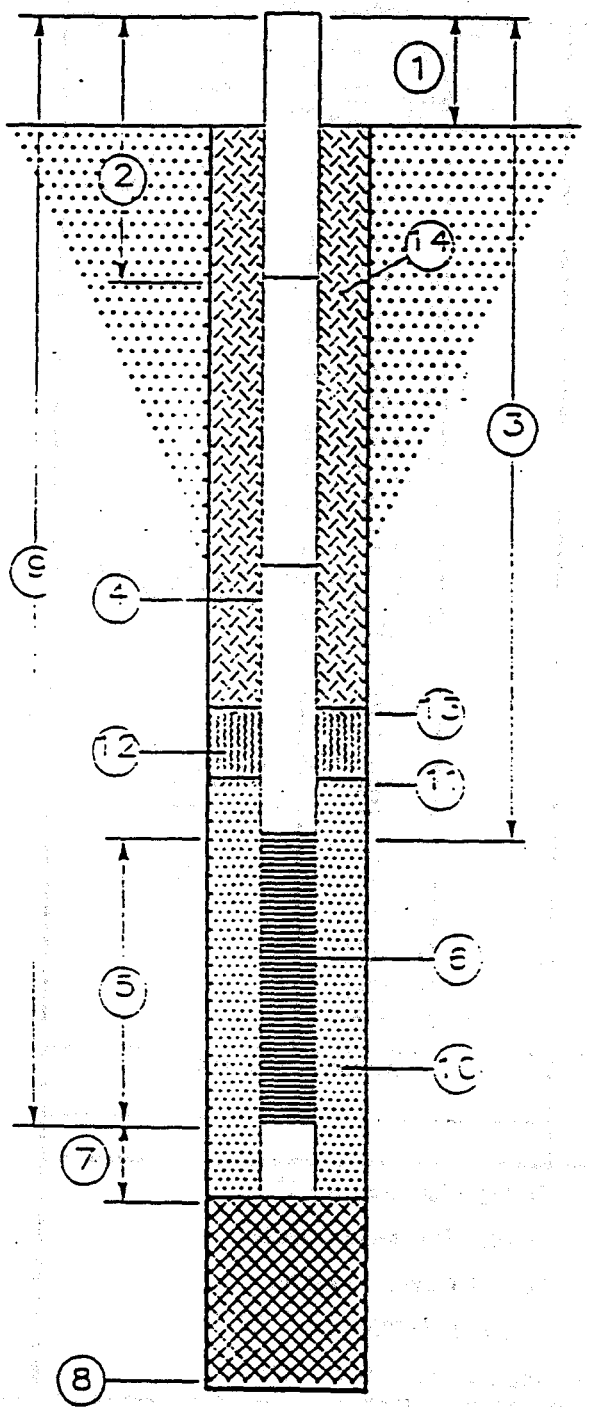
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1205s-2

DATE OF INSTALLATION 1-4-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

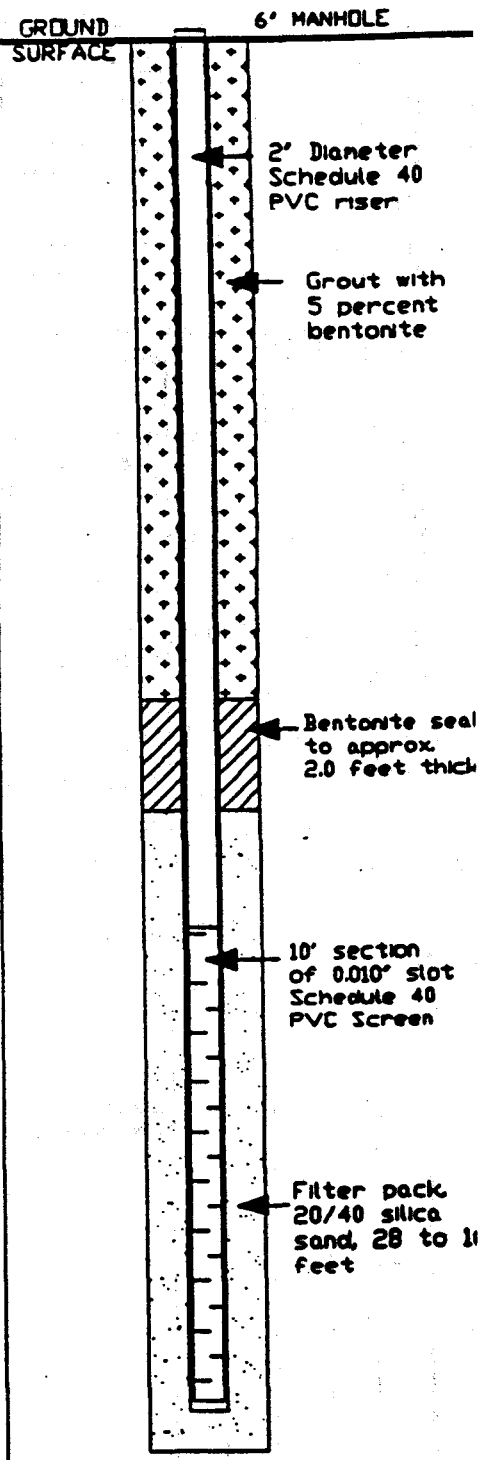
    Method of Placement Pour

Navy Hospital

UST Investigation
EnSafe/Allen & Hoshall

SAMPLE NUMBER DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	TIME	DESCRIPTION OF SUBSURFACE MATERIALS
					BORING DATE 05/18/92
	SS	0		1018	(0-2 feet) No sample recovery.
	SS	50	13	1019	(2-4 feet) Reddish brown silty clay with organics.
5	SS	79	9	1027	(4-6 feet) Silty clay, brown with minor organics.
	SS	88	24	1037	(6-8 feet) Dark brown silty clay, with moderate amounts organics, (6.0 to 7.5). Dark gray silty clay with less silt than above.
	SS	92	18	1043	(8-10 feet) Brown silty clay (8.0 to 8.3). Gray clayey silt, mostly silt (8.3 to 8.7). Brown silty clay with organics and some iron staining (8.7 to 9.8).
10	SS	88	9	1051	(10-12 feet) Brown silty clay with moderate amounts of organics. Wet zone, 10.4 to 10.9.
	SS	50	7	1059	(12-14 feet) Brown silty clay (12.0 to 12.3). Moist silty clay with moderate gray clay.
15	SS	100	12	1104	(14-16 feet) Brown silty clay with moderate organics slighty moist. Clay brown mottled with gray clay.
	SS	100	5	1117	(16-18 feet) Brown silty clay (16.0 to 16.4). Moist, clayey silt with moderate organics, mottled with gray clay.
20	SS	100	7	1124	(18-20 feet) Gray to brown clayey silt mottled with brown clay, moist.
25	SS	100	8	1149	(24-26 feet) Dark gray clayey silt, wet. (note - resampled due to no recovery).
					Boring terminated at 28.5 feet.
30					

WELL CONSTRUCTION DETAILS



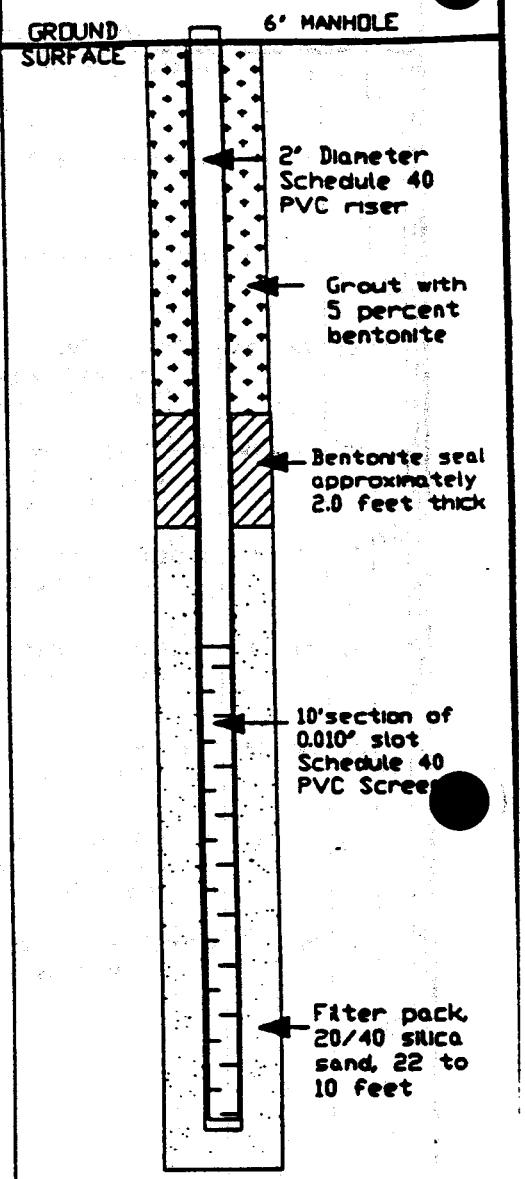
ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
NAVAL HOSPITAL
NAS MEMPHIS, TN.

BORING 1 / MONITORING WELL 1
BUILDING H-100
(NH01LS)

DATE: 06/11/92 | DWG NAME: NMH-MW1

SAMPLE NUMBER DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	TIME	DESCRIPTION OF SUBSURFACE MATERIALS
					BORING DATE 05/19/92
	SS	88	17	1525	(0-2 feet) Dark brown clay with silt (0 to 0.7). Poorly sorted medium to coarse grained sand and fine gravel (0.7 to 1.75).
	SS	75	15	1526	(2-4 feet) Medium to coarse grained sand with fine gravel and minor amounts of silt and clay.
5	SS	92	8	1529	(4-6 feet) Medium to coarse grained sand with minor amounts of silt and clay.
	SS	96	4	1534	(6-8 feet) Medium to coarse grained sand with minor amounts of clay and fine gravel.
	SS	79	3	1541	(8-10 feet) Medium to coarse grained sand with minor amounts of silt, clay, and some fine gravel (8.0 to 9.4). Dark gray clay (9.4 to 9.6).
10	SS	88	6	1545	(10-12 feet) Sand, medium to coarse grained with minor amounts of silt and clay (10.0 to 11.3). Dark gray silty clay with minor organics.
	SS	100	6	1552	(12-14 feet) Brown clay with moderate amounts of organics.
15	SS	100	8	1558	(14-16 feet) Brown and gray mottled clay with minor amounts of silt, and moderate amounts of organics. Wet zone 14.8 to 15.0. Water table at 14.8.
	SS	100	5	1605	(16-18 feet) Brown and gray mottled silty clay with minor organics. Wet.
20	SS	100	7	1613	(18-20 feet) Gray to brown clayey silt. Wet.
					Boring completed to 22.5 feet. Well set at approximately 22.0 feet.
25					
30					

WELL CONSTRUCTION DETAILS



CASING SET @ 22.0 FEET.

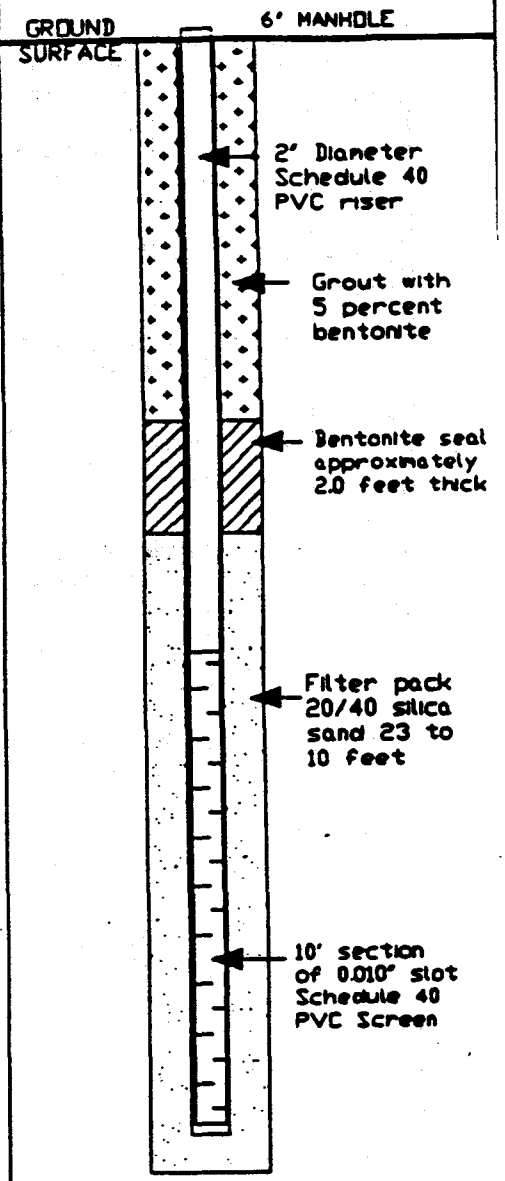
ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
NAVAL HOSPITAL
NAS MEMPHIS, TN.

BORING 2 / MONITORING WELL 2
BUILDING H-100
(NH02LS)

DATE: 06/11/92 | DWG NAME: NMH-MW2

SAMPLE NUMBER DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	TIME	DESCRIPTION OF SUBSURFACE MATERIALS
					BORING DATE 05/20/92
	SS	0		1328	(0-2 feet) No sample recovery due to wooden supports beneath concrete surface.
	SS	0		1339	(2-4 feet) No sample recovery due to wooden supports beneath the concrete surface.
5	SS	100	7	1401	(4-6 feet) Brown and gray mottled silty clay with moderate amounts of organics.
	SS	100	4	1407	(6-8 feet) Brown to gray mottled silty clay, with moderate amounts of organics. Moist zone 6.5 to 6.8.
	SS	100	8	1409	(8-10 feet) Brown to gray mottled silty clay with a moderate amount of organics.
10	SS	100	6	1419	(10-12 feet) Brown to gray silt and clay with moderate amounts of organics.
	SS	100	7	1427	(12-14 feet) Brown and gray mottled clay with minor silts (12.0 to 13.8). Dark gray silty clay (13.8 to 14.0).
15	SS	65	5	1432	(14-16 feet) Dark green to gray clay with minor silt.
	SS	100	8	1445	(16-18 feet) Dark green clay little to no silt, moist (slightly plastic).
20	SS	100	12	1501	(18-20 feet) Dark green clay, moist and soft, slightly plastic.
25					Well screened at approximately 23.0 feet, no additional samples collected.
30					

WELL CONSTRUCTION DETAILS



CASING SET @ 23.0 FEET.

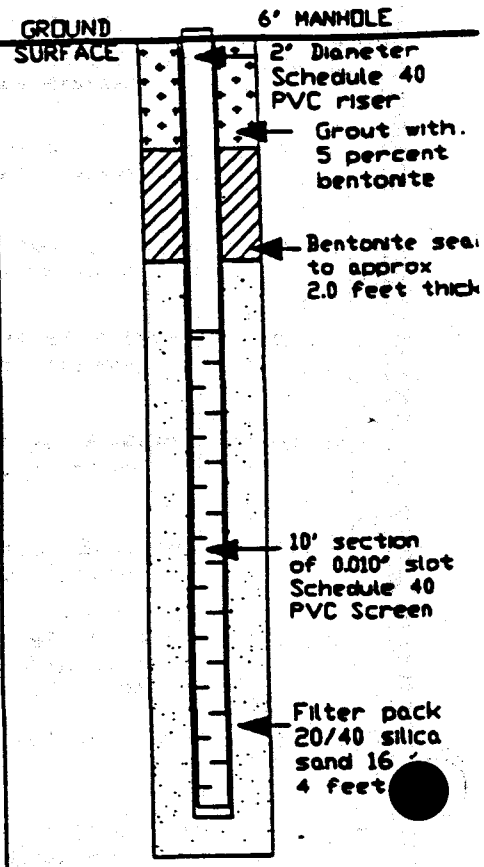
ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
NAVAL HOSPITAL
NAS MEMPHIS, TN.

BORING 3 / MONITORING WELL 3
BUILDING H-100
(NH03LS)

DATE: 06/17/92 | DWG NAME: NMH-MW3

SAMPLE NUMBER DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	TIME	DESCRIPTION OF SUBSURFACE MATERIALS
					BORING DATE 06/1-2/92
	SS	71	10	1200	(0-2 feet) Medium to coarse grained sand (fill). Strong petroleum odor. Wet.
	SS	79	5	1209	(2-4 feet) Dark brown clay with minor amounts of silt and some organics.
5	SS	100	4	1221	(4-6 feet) Brown to gray clay with moderate silts and minor organics. Thin lignite seam at 4.3 feet.
	SS	100	5	1232	(6-8 feet) Medium brown to gray clay with silt and organics.
	SS	100	4	1238	(8-10 feet) Clayey silt, gray with little to no organics, moist.
					NOTE: Drilled to 10 ft. on 06/01/92. Resumed drilling on 06/02/92. Delay due to rig breakdown.
10	SS	100	2	0853	(10-12 feet) Brown silty clay with moderate amounts of organics. Wet zone, 10.4 to 10.9 ft.
	SS	100	4	0923	(12-14 feet) Dark green clayey silt, spongey and moist.
15	SS	100	4	0949	(14-16 feet) Dark green clay with minor silt. Slightly moist.
	SS	100	9	1001	(16-18 feet) Dark green clay with little or no silt, dry.
					Boring terminated at 16.5 feet. Well set at approximately 16.0 feet.
20					
25					
30					

WELL CONSTRUCTION DETAILS



CASING SET @ 16.0 FEET.

ENVIRONMENTAL ASSESSMENT
UNDERGROUND STORAGE TANKS
NAVAL HOSPITAL
NAS MEMPHIS, TN.

BORING 4 / MONITORING WELL
BUILDING H-100
(NH04LS)

DATE: 06/17/92

DWG NAME: NMH-MW4

Navy Exchange

UST Investigations
Professional Services Industries
Hardin-Lawson
ERCE-Edge

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON, S C 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-751-1 AREA ____

DATE OF INSTALLATION 1/7/87

WELL HOLE DATA

Drill Date 1/7/87

Well Driller Hall, Blake and Associates (HBA)

Depth of Boring 21.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type -

WATER LEVEL DATA (All measurements from top of casing)

Water Level 6.65

Date of Measurement 1/10/87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 15 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log No

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY HBA

SCCWD# Engineering Registration NO 7961

DEVELOPED BY HLA

SCCWD# ____

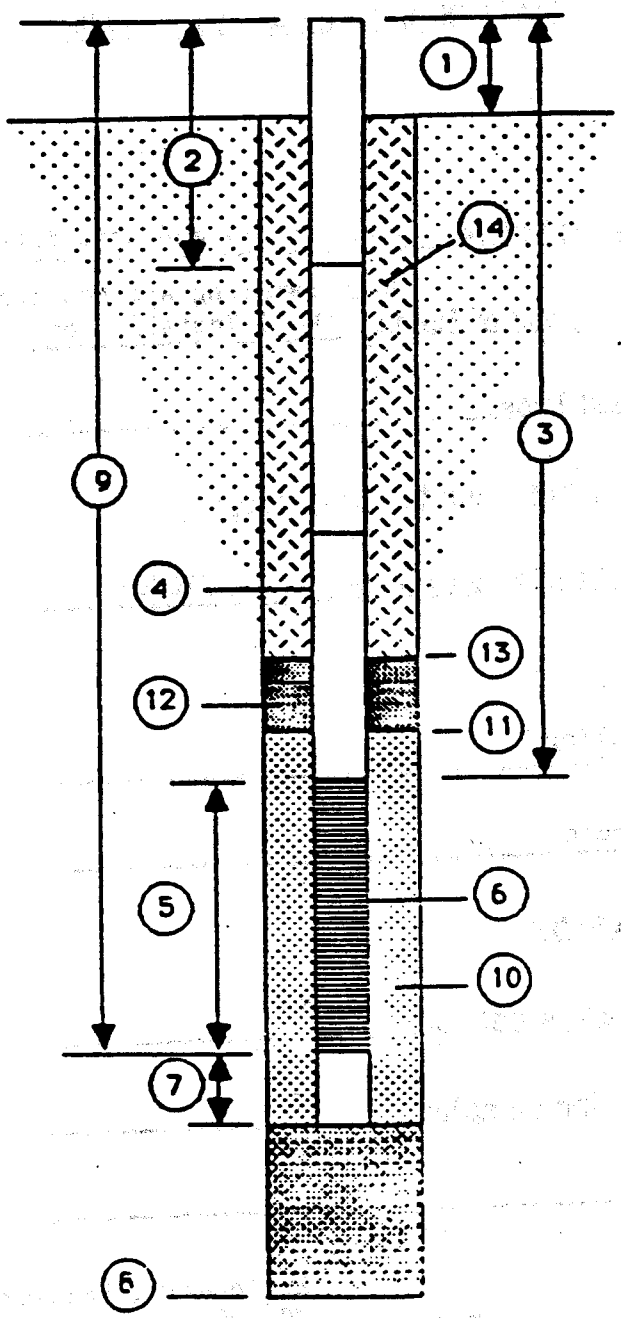
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-1

DATE OF INSTALLATION 1/7/87



1. Height of Casing above ground -0.4 ft (S[illegible] P[illegible])
2. Depth to first Coupling N/A

   Coupling Interval Depths _____
3. Total Length of Blank Pipe 5.5 ft
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 14.8 ft
6. Type of Screen Schedule 40 PVC, .020 slott[illegible]
7. Length of Sump 0.3 ft
8. Total Depth of Boring 21 ft Hole Diameter 6-3[illegible]
9. Depth To Bottom of Screen 20.7 ft
10. Type of Screen Filter Sand and Pea Gravel

    Quantity Used 175 lbs Size _____ U/C[illegible]
11. Depth To Top of Filter 3.8 ft
12. Type of Seal 1/2-inch bentonite pellets

    Quantity Used 37 pounds
13. Depth To Top of Seal 1.5 ft
14. Type of Grout cement-sand

    Grout Mixture 2:1

    Method of Placement poured

COMMENTS ON INSTALLATION

Location of Well: MEM-757-1

County	Township Number	Range Number	Section No.	Fraction
Shelby	N or S	E or W		

Property Owner's Name and Address: NAS Memphis, Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections: Exchange Service Station, Navy Road

Mark exact location of well in section grid with an 'x' — Sketch map of well location

N / S — 1 mile

Addition Name

Block Number

Lot Number

Remarks, Elevation, Source of Data, etc.

Elevation of Top of Casing (TOC): 270.38 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
Asphalt	Black	-	0	.3
Gravel & Sand Fill	Orange	dense	.3	.8
Silty Clay	Med Gray	soft med stf	.8	7.5
V. Silty Clay	Tan & Gray	soft med stf	7.5	12.0
Clayey Silt	Bwn & Gray	med stf	12.0	18.0
Clayey Silt	Dk-Md Gray	med stf	18.0	21.0

Well depth: 21.0 ft

Datum point from which all measurements are taken: Ground Surface

Method of Drilling: [ ] Cable tool [ ] Hollow rod [ ] Driven [ ] Dug [ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] Reverse rotary [ ] Jetted [x] Flight auger

Use: [ ] Domestic [ ] Public supply [ ] Industrial [ ] Irrigation [ ] Municipal [ ] Commercial [x] Test Well [ ] Heating or cooling [x] Monitoring

Casing Type: [ ] Steel [x] Threaded [ ] Galv [ ] Welded [x] PVC [ ] Solvent welded [ ] SS

Height above/below surface: -0.4

Drive shoe? Yes ___ No -x-

					Hole diameter
___ in to ___ ft	Wgt ___ lb/ft	Sch No 40			6.75 in to ___
___ in to ___ ft	Wgt ___ lb/ft	Sch No ___			___ in to ___
___ in to ___ ft	Wgt ___ lb/ft	Sch No ___			___ in to ___

Intake Portion of Well

Screen type: Schedule 40 or open hole from ___ ft to ___

Manufacturer: ___

Material: PVC Dia: 4-inch

Fittings: ___ Length: 14.8 ft

Set between: 5.9 ft and 20.7 ft Slot: .020

___ ft and ___ ft Slot: ___

___ ft and ___ ft Slot: ___

Method of installation: ___

Filter Pack

Source: ___ Gradation: sand & pea gravel

Method of installation: poured Composition: silica

Volume used: 175 lbs Depth to top of Fp: 3.8 ft

Grout

Used? [x] Yes [ ] No Volume used: 1.5 ft^3

[ ] Neat Cement [ ] Bentonite [x] cement-sand

Method of installation: poured

Depth from 0.0 ft to 1.5

from ___ ft to ___

Development

Method: hand bailing Duration: 15 min

Dates: 1/10/87 Sand content after ¾ hrs: 0

Chemicals used: none

Static Water Level

6.65 ft [x] below [ ] above grade TOC

Date measured: 1/10/87

Pumping Water Level

N/A ft below above grade Date ___

After ___ hrs pumping at ___ gpm

Specific Capacity

N/A gpm/ft of drawdown at ___ hours

Date ___

Pump

Date installed: N/A Type ___

Manufacturer ___ Model No ___

HP ___ Volts ___ Capacity ___

Depth of pump intake setting ___ No of stages ___

[ ] Oil [ ] Water lubrication Power source ___

Material of drop pipe ___ bowls ___

shafting ___ impellers ___ Bowl dia ___

Column pipe dia ___ Length ___ Modifications ___

Well Head Completion

[ ] Pitless adaptor [ ] Basement offset Distance above grade ___

Nearest Sources of Possible Contamination

___ ft Direction ___ Type ___

Well disinfected upon completion? [ ] Yes [ ] No

Geophysical Logs Run

None

Contractor Name and Address

Name of Driller: Hall, Blake and Associates

State License Number: Engineering Registration # 7961

Water Quality

Sample taken? [x] Yes [ ] No

Where analyzed: Industrial & Environmental Analysts, Inc.

Date well completed: 1/7/87

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON, S C 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-2 AREA ____

DATE OF INSTALLATION 1/8/87

WELL HOLE DATA

Drill Date 1/8/87

Well Driller Hall, Blake and Associates (HBA)

Depth of Boring 22.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type -

WATER LEVEL DATA (All measurements from top of casing)

Water Level 7.22

Date of Measurement 1/10/87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 15 min

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log Nc

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY HBA

SCCWD# Engineering Registration # 7961

DEVELOPED BY HLA

SCCWD# ____

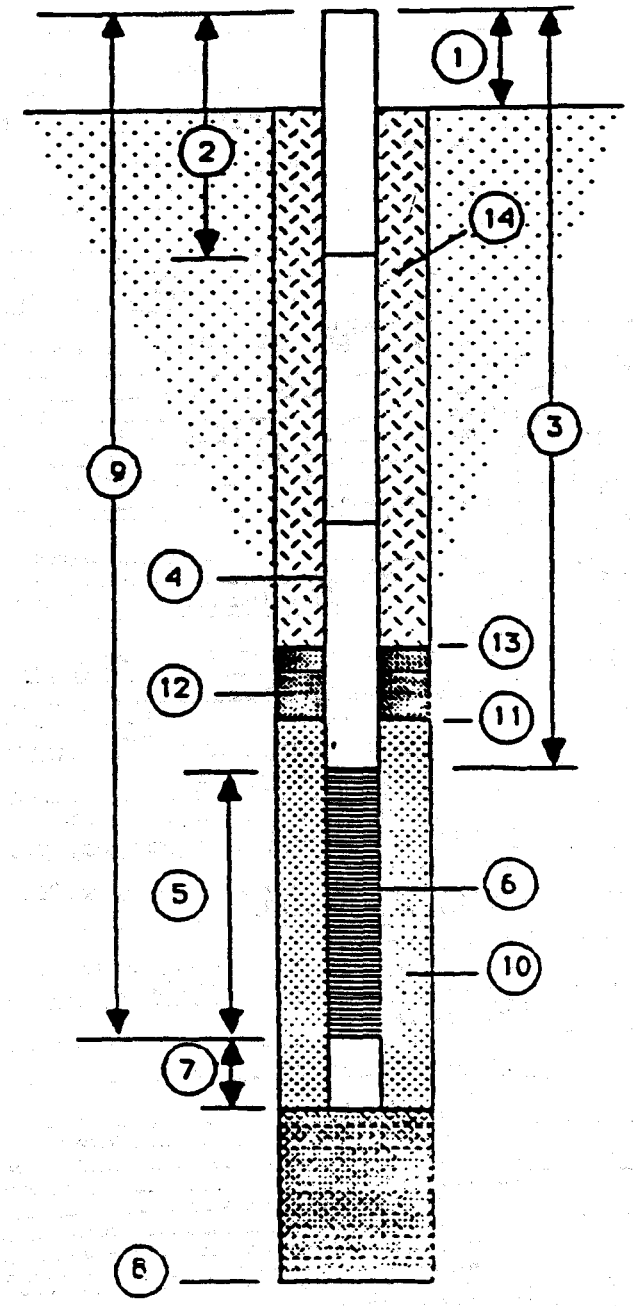
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-2

DATE OF INSTALLATION 1/8/87



1. Height of Casing above ground -0.3 (See Plate D
2. Depth to first Coupling N/A

   Coupling Interval Depths _____
3. Total Length of Blank Pipe 4.5 ft
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 14.8 ft
6. Type of Screen Schedule 40 PVC, .020 slott
7. Length of Sump 0.3 ft
8. Total Depth of Boring 22.0 ft Hole Diameter 6-3/
9. Depth To Bottom of Screen 19.6
10. Type of Screen Filter Sand and Pea Gravel

    Quantity Used 193 lbs Size _____ U/C _____
11. Depth To Top of Filter 3.0 ft
12. Type of Seal 1/2-inch bentonite pellets

    Quantity Used 42 lbs
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-sand

    Grout Mixture 2:1

    Method of Placement poured

COMMENTS ON INSTALLATION

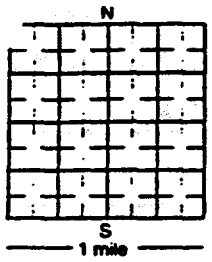
County: Shelby

Township | N or S | E or W | ¼ ¼ ¼

NAS Memphis
Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections
Exchange Service Station, Navy Road

Show exact location of well in section grid with an 'x'



Sketch map of well location

Addition Name

Block Number

Lot Number

Remarks, Elevation, Source of Data, etc.
Elevation of
Top of Casing (TOC): 270.68 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
Asphalt	Black	-	0	0.3
Gravel & Sand Fill	Orange	dense	0.3	1.0
Silty Clay	Md-Dk Gray	med stf	1.0	8.0
V. Silty Clay	Tan & Gray	med stf	8.0	14.0
Clayey Silt	Bwn & Gray	med stf	14.0	21.5
Clayey Silt	Md-Dk Gray	med stf	21.5	22.0

Contractor Name and Address

Name of Driller: Hall, Blake and Associates

Well depth: 19.9 ft

Datum point from which all measurements are taken: Ground Surface

Method of Drilling
[ ] Cable tool [ ] Hollow rod [ ] Driven [ ] [redacted]
[ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] ____
[ ] Reverse rotary [ ] Jetted [X] Flight auger

Use
[ ] Domestic [ ] Public supply [ ] Industrial [ ] ____
[ ] Irrigation [ ] Municipal [ ] Commercial
[X] Test Well [ ] Heating or cooling [X] Monitoring

Casing Type
[ ] Steel [X] Threaded Height above/below surface: -0.3
[ ] Galv [ ] Welded Drive shoe? Yes ___ No X
[X] PVC [ ] Solvent welded
[ ] SS

				Hole diameter
____ in to ____ ft	Wgt ____ lb/ft	Sch No 40		6.75 in to ____
____ in to ____ ft	Wgt ____ lb/ft	Sch No ____		____ in to ____
____ in to ____ ft	Wgt ____ lb/ft	Sch No ____		____ in to ____

Intake Portion of Well
Screen type: Schedule 40 or open hole from ____ ft to ____
Manufacturer ____
Material: PVC Dia: 4-inch
Fittings ____ Length: 14.8
Set between 4.8 ft and 19.6 ft Slot: 020
____ ft and ____ ft Slot ____
____ ft and ____ ft Slot ____
Method of installation ____

Filter Pack
Source ____ Gradation: Sand & Pea Gra
Method of installation ____ Composition: silica
Volume used: 193 lbs Depth to top of fp: 3.0 ft

Grout
Used? X Yes [ ] No Volume used: 1 ft³
[ ] Neat Cement [ ] Bentonite X cement-sand
Method of installation: poured
Depth from 0.0 ft to 1.0
from ____ ft to ____

Development
Method: Hand Bailing Duration: 15 m[redacted]
Dates: 1/10/87 Sand content after ½ hrs: 0
Chemicals used: none

Static Water Level
7.22 ft X below [ ] above grade X TOC
Date measured: 1/10/87

Pumping Water Level
N/A ft below ___ above grade Date ____
After ____ hrs pumping at ____ g

Specific Capacity
N/A gpm/ft of drawdown at ____ hours
Date ____

Pump
Date installed: N/A Type ____
Manufacturer ____ Model No ____
HP ____ Volts ____ Capacity ____
Depth of pump intake setting ____ No of stages ____
[ ] Oil [ ] Water lubrication Power source ____
Material of drop pipe ____ bowls ____
shafting ____ impellers ____ Bowl dia ____
Column pipe dia ____ Length ____ Modifications ____

Well Head Completion
[ ] Pitless adaptor [ ] Basement offset Distance above grade ____

Nearest Sources of Possible Contamination
____ ft Direction ____ Type ____
Well disinfected upon completion? [ ] Yes [ ] No

Geophysical Logs Run
None

Water Quality
Sample taken? X Yes [ ] No
Where analyzed: Industrial & Environmen[redacted] Analysts, Inc.

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-3 AREA ____

DATE OF INSTALLATION 1/8/87

WELL HOLE DATA

Drill Date 1/8/87

Well Driller Hall, Blake and Associates (HBA)

Depth of Boring 21.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type -

WATER LEVEL DATA (All measurements from top of casing)

Water Level 6.27

Date of Measurement 1/10/87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 15 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log No

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY HBA

SCCWD# Engineering Registration # 7961

DEVELOPED BY HLA

SCCWD# ____

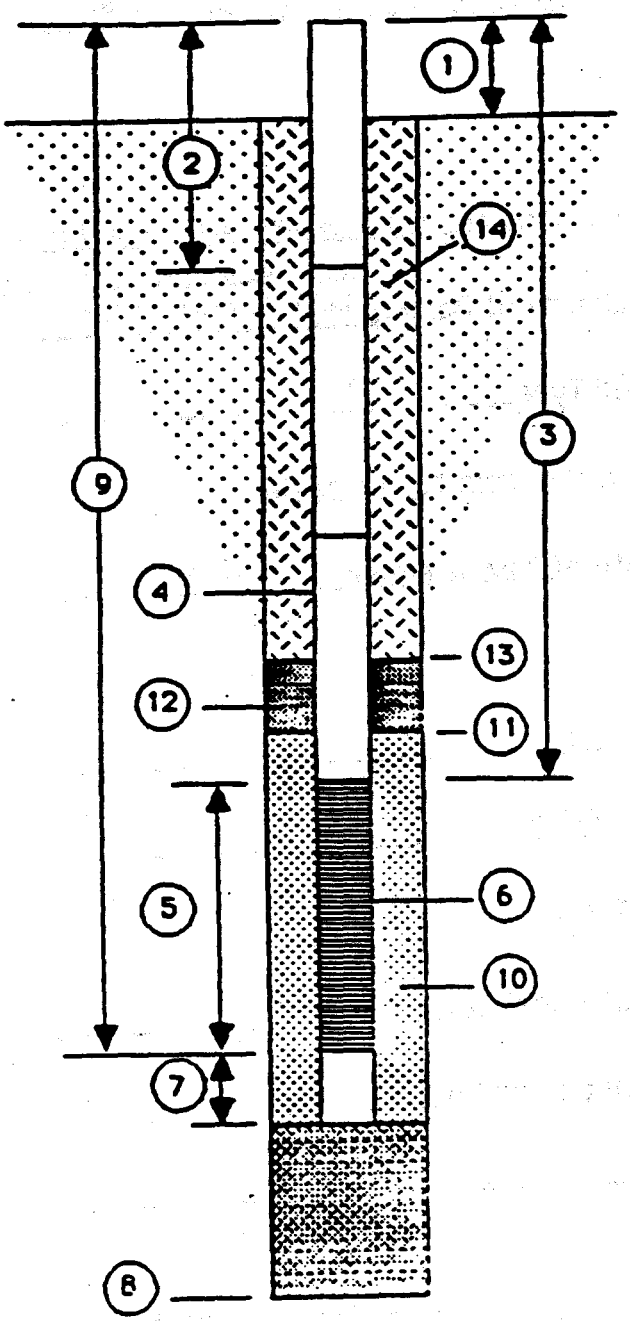
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-3

DATE OF INSTALLATION 1/8/87



1. Height of Casing above ground -0.4 ft (See Plate)
2. Depth to first Coupling 5.0 ft

   Coupling Interval Depths one coupler
3. Total Length of Blank Pipe 4.7 ft
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 14.8 ft
6. Type of Screen Schedule 40 PVC, .020 slott
7. Length of Sump 0.3 ft
8. Total Depth of Boring 21.0 ft Hole Diameter 6-3/4
9. Depth To Bottom of Screen 19.9 ft
10. Type of Screen Filter Sand & Pea Gravel

    Quantity Used 75 lbs. Size _____ U/C _____
11. Depth To Top of Filter 3.0 ft
12. Type of Seal 1/2-inch bentonite pellets

    Quantity Used 25 lbs.
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-sand

    Grout Mixture 2:1

    Method of Placement poured

COMMENTS ON INSTALLATION.

Location of Well: MEM-757-3

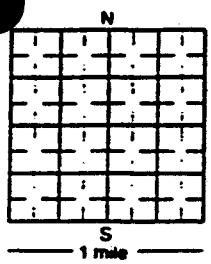
County	Township Number	Range Number	Section No.	Fraction
Shelby	N or S	E or W		

Township:

Property owner's name and address: NAS Memphis, Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections: Exchange Service Station, Navy Road

Mark exact location of well in section grid with an "x"



Sketch map of well location

Addition Name

Block Number

Lot Number

Remarks, Elevation, Source of Data, etc.

Elevation of Top of Casing (TOC): 270.26 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
Asphalt	Black	--	0.0	0.3
Gravel & Sand Fill	Orange	dense	0.3	1.0
Silty Clay	Med. Gray	soft	1.0	8.0
Very Silty Clay	Tan & Gray	med stf	8.0	12.5
Clayey Silt	Bwn & Gary	med stf	12.5	20.5
Clayey Silt	Dk-Med Gray	med stf	20.5	21.0

Contractor Name and Address

Name of Driller: Hall Blake and Associates

State License Number: Engineering Registration # 7961

Well depth: 20.2 ft

Datum point from which all measurements are taken: Ground Surface

Method of Drilling: [ ] Cable tool [ ] Hollow rod [ ] Driven [ ] Dug [ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] ____ [ ] Reverse rotary [ ] Jetted [X] Flight auger

Use: [ ] Domestic irrigation [ ] Public supply Municipal [ ] Industrial [ ] Commercial [ ] ____ [X] Test Well [ ] Heating or cooling [X] Monitoring

Casing Type: [ ] Steel [ ] Galv [X] PVC [ ] SS [X] Threaded [ ] Welded [ ] Solvent welded

Height above/below surface: -0.4 ft

Drive shoe? Yes ___ No X

____ in to ____ ft Wgt ____ lb/ft Sch No 40 — Hole diameter 6.75 in to ____

____ in to ____ ft Wgt ____ lb/ft Sch No ____ — ____ in to ____

____ in to ____ ft Wgt ____ lb/ft Sch No ____ — ____ in to ____

Intake Portion of Well

Screen type: Schedule 40 or open hole from ____ ft to ____

Manufacturer: ____

Material: PVC Dia: 4-inch

Fittings: ____ Length: 14.8 ft

Set between 5.1 ft and 19.9 ft Slot .020

____ ft and ____ ft Slot ____

____ ft and ____ ft Slot ____

Method of installation: ____

Filter Pack

Source: ____ Gradation: Sand & Pea Gr

Method of installation: poured Composition: silica

Volume used: 175 lbs. Depth to top of fp: ____

Grout

Used? X Yes [ ] No Volume used: 1.0 ft^3

[ ] Neat Cement [ ] Bentonite [X] cement sand

Method of installation: poured

Depth from 0.0 ft to 1.0

from ____ ft to ____

Development

Method: hand bailing Duration: 15 min.

Dates: 1/10/87 Sand content after 2 hrs: 0

Chemicals used: none

Static Water Level

6.27 ft [X] below [ ] above grade TOC

Date measured: 1/10/87

Pumping Water Level

N/A ft [ ] below [ ] above grade Date ____

After ____ hrs pumping at ____ gpm

Specific Capacity

N/A gpm/ft of drawdown at ____ hours

Date ____

Pump

Date installed: N/A Type ____

Manufacturer ____ Model No ____

HP ____ Volts ____ Capacity ____

Depth of pump intake setting ____ No of stages ____

[ ] Oil [ ] Water lubrication Power source ____

Material of drop pipe ____ bowls ____

shafting ____ impellers ____ Bowl dia ____

Column pipe dia ____ Length ____ Modifications ____

Well Head Completion

Pitless adaptor Basement offset Distance above grade ____

Nearest Sources of Possible Contamination

____ ft Direction ____ Type ____

Well disinfected upon completion? Yes No

Geophysical Logs Run

None

Water Quality

Sample taken? X Yes

Where analyzed: Industrial & Environmental Analysts, Inc.

Date well completed: 1/8/87

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-4 AREA ____

DATE OF INSTALLATION 1/9/87

WELL HOLE DATA

Drill Date 1/9/87 Well Driller Hall Blake & Associates

Depth of Boring 21.0 ft Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger Mud Type ---

WATER LEVEL DATA (All measurements from top of casing)

Water Level 4.98 Date of Measurement 1/10/87

DEVELOPMENT DATA

Development Method Hand bailing

Length of Time Developed 15 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X Geophysical Log No

Physical Core X Cutting Samples X

Water Level Observations ____

DRILLED BY Hall Blake & Assoc. SCCWD# Engineering Registration # 7961

DEVELOPED BY HLA SCCWD# F

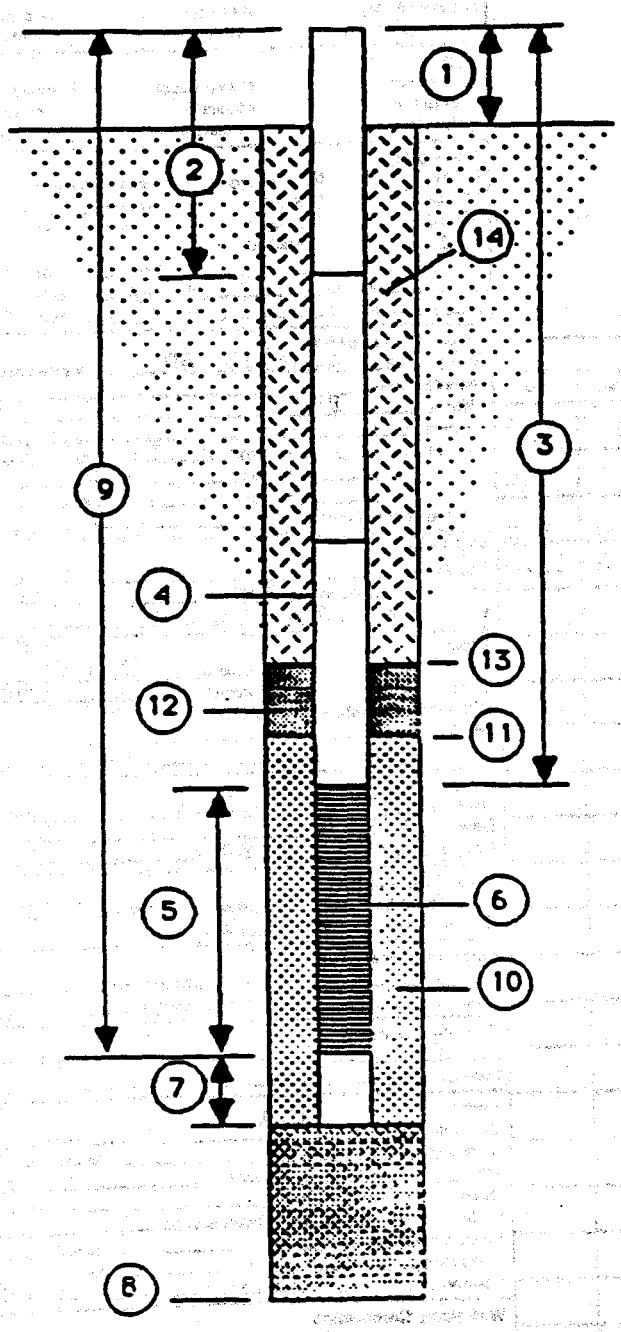
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-4

DATE OF INSTALLATION 1/9/87



1. Height of Casing above ground -0.4 ft (See Plate
2. Depth to first Coupling 4.9 ft

   Coupling Interval Depths one coupler
3. Total Length of Blank Pipe 4.5 ft
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 14.8 ft
6. Type of Screen Schedule 40 PVC, .020 slott
7. Length of Sump 0.3 ft
8. Total Depth of Boring 21.0 ft Hole Diameter 6-3/
9. Depth To Bottom of Screen 19.7 ft
10. Type of Screen Filter Sand & Pea Gravel

    Quantity Used 140 lbs Size____ U/C____
11. Depth To Top of Filter 3.3 ft
12. Type of Seal 1/2-inch bentonite pellets

    Quantity Used 17 lbs.
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-sand

    Grout Mixture 2:1

    Method of Placement poured

COMMENTS ON INSTALLATION

County	Township Number	Range Number	Section No.	Fraction
Shelby	N or S	E or W		

NAS Memphis
Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections
Exchange Service Station, Navy Road

Show exact location of well in section grid with an 'x'

Sketch map of well location

N
S
1 mile

Addition Name

Block Number

Lot Number

Remarks, Elevation, Source of Data, etc.

Elevation of
Top of Casing (TOC): 268.74 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
Gravel & Topsoil	Brown	--	0	0.7
Silty Clay	Dk Gray	soft to med stf	0.7	7.0
Very Silty Clay	Tan & Gray	soft to med stf	7.0	9.8
Clayey Silt	Gray & Tan	med stf	9.8	21.0

Contractor Name and Address

Name of Driller: Hall Blake and Associates

State License Number: Engineering Registration # 7961

Well depth: 20.0 ft

Datum point from which all measurements are taken: Ground Surface

Method of Drilling
[ ] Cable tool [ ] Hollow rod [ ] Driven [ ] Dug
[ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] ____
[ ] Reverse rotary [ ] Jetted [X] Flight auger

Use
[ ] Domestic [ ] Public supply [ ] Industrial [ ] ____
[ ] Irrigation [ ] Municipal [ ] Commercial
[X] Test Well [ ] Heating or cooling [X] Monitoring

Casing Type
[ ] Steel [X] Threaded
[ ] Galv [ ] Welded
[X] PVC [ ] Solvent welded
[ ] SS

Height above/below surface: -0.4
Drive shoe? Yes ___ No X

				Hole diameter
____ in to ____ ft	Wgt ____ lb/ft	Sch No 40		6.75 in to
____ in to ____ ft	Wgt ____ lb/ft	Sch No ____		____ in to
____ in to ____ ft	Wgt ____ lb/ft	Sch No ____		____ in to

Intake Portion of Well
Screen type: Schedule 40 or open hole from ____ ft to ____
Manufacturer ____
Material: PVC Dia: 4-inch
Fittings ____ Length: 14.8 ft
Set between 4.9 ft and 19.7 ft Slot .020
____ ft and ____ ft Slot ____
____ ft and ____ ft Slot ____
Method of installation ____

Filter Pack
Source ____ Gradation: Sand & Pea Gr
Method of installation: poured Composition: silica
Volume used: 140 lbs Depth to top of fp: 3.3 ft

Grout
Used? [X] Yes [ ] No Volume used: 1.0 ft^3
[ ] Neat Cement [ ] Bentonite [X] cement-sand
Method of installation: poured
Depth from 0.0 ft to 1.0
from ____ ft to ____

Development
Method: hand bailing Duration: 15 min.
Dates: 1/10/87 Sand content after ½ hrs: 0
Chemicals used: --none

Static Water Level
4.98 ft [X] below [ ] above grade TOC
Date measured: 1/10/87

Pumping Water Level
N/A ft below ___ above grade Date ____
After ____ hrs pumping at ____

Specific Capacity
N/A gpm/ft of drawdown at ____ hrs
Date ____

Pump
Date installed: N/A Type ____
Manufacturer ____ Model No ____
HP ____ Volts ____ Capacity ____
Depth of pump intake setting ____ No of stages ____
[ ] Oil [ ] Water lubrication Power source ____
Material of drop pipe ____ bowls ____
shafting ____ impellers ____ Bowl dia ____
Column pipe dia ____ Length ____ Modifications ____

Well Head Completion
Press adaptor Basement offset Distance above grade ____

Nearest Sources of Possible Contamination
____ ft Direction ____ Type ____
Well disinfected upon completion? Yes No

Geophysical Logs Run
None

Water Quality
Sample taken? [X] Yes
Where analyzed: Industrial & Environm Analysts, Inc.

Date well completed: 1/9/87

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-5 AREA ____

DATE OF INSTALLATION 1/9/87

WELL HOLE DATA

Drill Date 1/9/87

Well Driller Hall Blake and Associates

Depth of Boring 21.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type ---

WATER LEVEL DATA (All measurements from top of casing)

Water Level 6.44

Date of Measurement 1/10/87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 15 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log No

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY Hall Blake & Assoc.

SCCWD# Engineering Registration # 7961

DEVELOPED BY HLA

SCCWD# ____

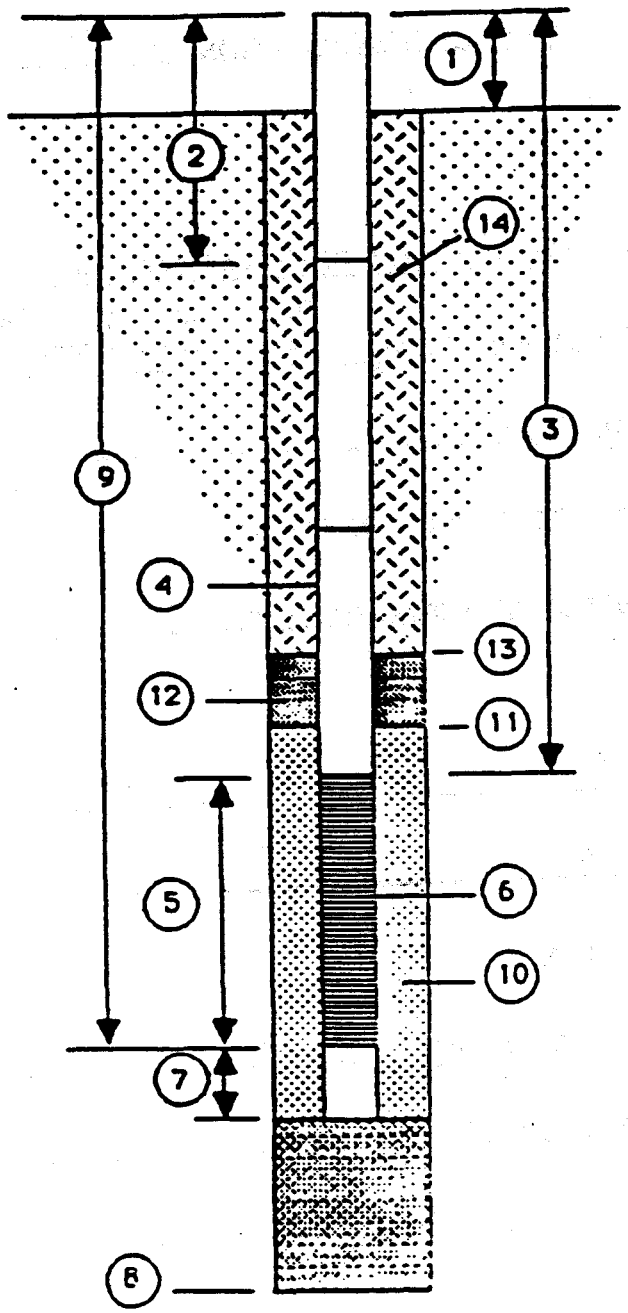
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-5

DATE OF INSTALLATION 1/9/87



1. Height of Casing above ground -0.4 (See Plate
2. Depth to first Coupling N/A

   Coupling Interval Depths _____

3. Total Length of Blank Pipe 5.0 ft
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 14.8 ft
6. Type of Screen Schedule 40 PVC, .020 slott
7. Length of Sump 0.3 ft
8. Total Depth of Boring 21.0 ft Hole Diameter 6-3/
9. Depth To Bottom of Screen 20.2 ft
10. Type of Screen Filter Sand and Pea Gra

    Quantity Used 210 lbs Size _____ U/C _____

11. Depth To Top of Filter 3.5 ft
12. Type of Seal 1/2-inch bentonite pellets

    Quantity Used 17 lbs

13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-sand

    Grout Mixture 2:1

    Method of Placement poured

COMMENTS ON INSTALLATION

County	Township	Township Number	Range Number	Section No.	Fraction
Shelby		N or S	E or W		

NAS Memphis
Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections
Exchange Service Station, Navy Road

w exact location of well in section grid with an "x"

Sketch map of well location

N

S

1 mile

Addition Name

Block Number

Lot Number

Well depth: 20.5 ft

Datum point from which all measurements are taken: Ground Surface

Method of Drilling
[ ] Cable tool [ ] Hollow rod [ ] Driven [ ] Dug
[ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] ____
[x] Reverse rotary [ ] Jetted [x] Hollow auger

Use
[ ] Domestic [ ] Public supply [ ] Industrial [ ] ____
[ ] Irrigation [ ] Municipal [ ] Commercial
[x] Test Well [ ] Heating or cooling [x] Monitoring

Casing Type
[ ] Steel [x] Threaded
[ ] Galv [ ] Welded
[x] PVC [ ] Solvent welded
[ ] SS

Height above/below surface: -0.4
Drive shoe? Yes ___ No x

					Hole diameter
___ in	to ___ ft	Wgt ___ lb/ft	Sch No 40		6.75 in to
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___		___ in to
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___		___ in to

Intake Portion of Well
Screen type: Schedule 40 or open hole from ___ ft to ___
Manufacturer ___
Material: PVC Dia: 4-inches
Fittings ___ Length: 14.8 ft
Set between 5.4 ft and 20.2 ft Slot .020
___ ft and ___ ft Slot ___
___ ft and ___ ft Slot ___
Method of installation ___

Filter Pack
Source ___ Gradation: Sand & Pea Gr
Method of installation: poured Composition: silica
Volume used: 210 lbs Depth to top of fp: 3.5 ft

Grout
Used? x Yes [ ] No Volume used: 1.0 ft^3
[ ] Neat Cement [ ] Bentonite x cement-sand
Method of installation: poured
Depth from 0.0 ft to 1.0
from ___ ft to ___

Development
Method: hand bailing Duration: 15 min
Dates: 1/10/87 Sand content after ¾ hrs: 0
Chemicals used: none

Static Water Level
6.44 ft x below [ ] above/grade TOC
Date measured: 1/10/87

Pumping Water Level
N/A ft below ___ above grade Date ___
After ___ hrs pumping at ___

Specific Capacity
N/A gpm/ft of drawdown at ___ hrs
Date ___

Pump
Date installed: N/A Type ___
Manufacturer ___ Model No ___
HP ___ Volts ___ Capacity ___
Depth of pump intake setting ___ No of stages ___
[ ] Oil [ ] Water lubrication Power source ___
Material of drop pipe ___ bowls ___
shafting ___ impellers ___ Bowl dia ___
Column pipe dia ___ Length ___ Modifications ___

Well Head Completion
Pitless adaptor Basement offset Distance above grade ___

Nearest Sources of Possible Contamination
___ ft Direction ___ Type ___
Well disinfected upon completion? Yes No

Geophysical Logs Run
None

Water Quality
Sample taken? x Yes No
Where analyzed: Industrial & Environmental Analysts, Inc.

Date well completed: 1/9/87

Remarks, Elevation, Source of Data, etc.
Elevation of
Top of Casing (TOC): 271.14 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
Asphalt	Black	--	0.0	0.3
Gravel & Sand Fill	Orange	dense	0.3	0.6
Silty Clay	med to dk Gray	med stf	0.6	2.5
Very Silty Clay	Tan & Gray	med stf	2.5	11.3
Clayey Silt	Gary & Bwn	med stf	11.3	19.5
Clayey Silt	Dk Gray	med stf	19.5	21.0

Contractor Name and Address

Name of Driller: Hall Blake and Associates

State License Number: Engineering Registration # 7961

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-6 AREA ____

DATE OF INSTALLATION 1/9/87

WELL HOLE DATA

Drill Date 1/9/87 Well Driller Hall Blake and Associates

Depth of Boring 21.0 ft Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger Mud Type --

WATER LEVEL DATA (All measurements from top of casing)

Water Level 7.69 Date of Measurement 1/10/87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 15 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X Geophysical Log No

Physical Core X Cutting Samples X

Water Level Observations ____

DRILLED BY HBA SCCWD# Engineering Registration # 7961

DEVELOPED BY HLA SCCWD# ____

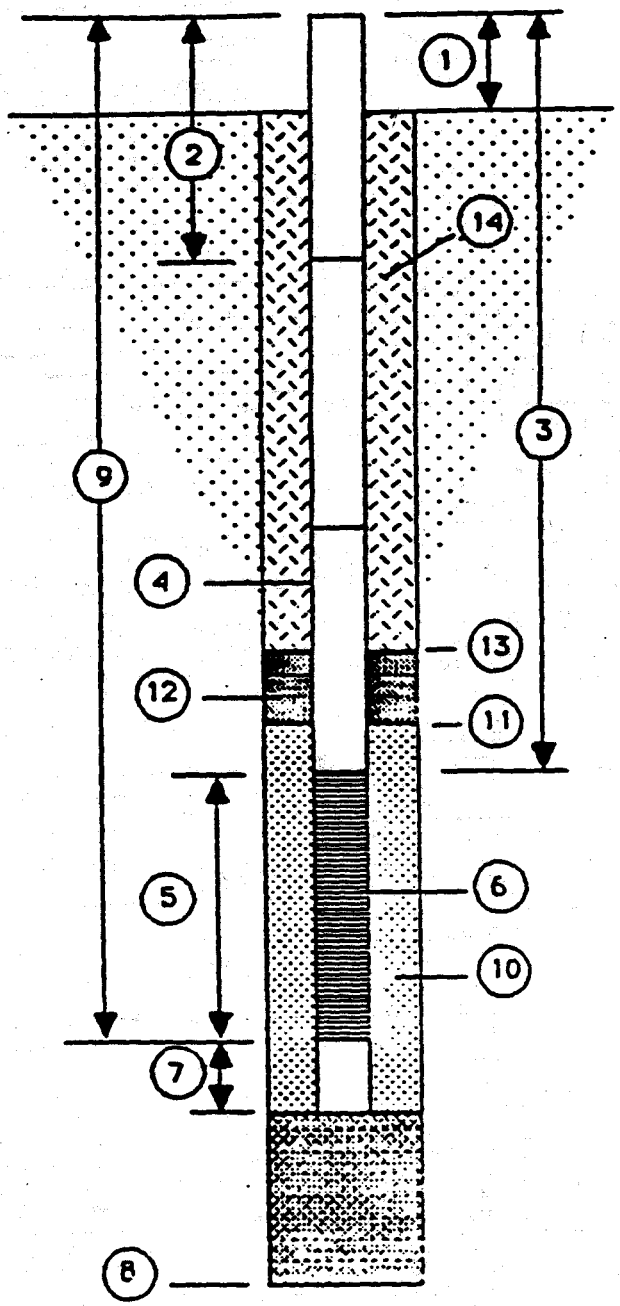
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-6

DATE OF INSTALLATION 1/9/87



1. Height of Casing above ground -0.2 (See Plat
2. Depth to first Coupling 4.9 ft

   Coupling Interval Depths one coupler
3. Total Length of Blank Pipe 4.7 ft
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 14.8 ft
6. Type of Screen Schedule 40 PVC, .020 slot
7. Length of Sump 0.3 ft
8. Total Depth of Boring 21.0 ft Hole Diameter 6-3/
9. Depth To Bottom of Screen 19.7 ft
10. Type of Screen Filter Sand & Pea Gravel

    Quantity Used 140 lbs Size ____ U/C ____
11. Depth To Top of Filter 3.0 ft
12. Type of Seal 1/2-inch bentonite pellets

    Quantity Used 25 lbs.
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-sand

    Grout Mixture 2:1

    Method of Placement poured

COMMENTS ON INSTALLATION

Location of Well: MEM-757-6

County	Township Number	Range Number	Section No.	Fraction
Shelby	N or S	E or W		

Township

Street Address and City or Distance and Direction from Road Intersections: Exchange Service Station, Navy Road

Mark exact location of well in section grid with an 'x'

Sketch map of well location

N

S

1 mile

Addition Name

Block Number

Lot Number

Remarks, Elevation, Source of Data, etc.

Elevation of
Top of Casing (TOC): 271.62 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
Asphalt	Black	--	0.0	0.3
Gravel & Sand Fill	Orange	dense	0.3	0.8
Silty Clay	Dk-Med Gry	soft	0.8	3.0
Silty Clay	Gray & Tan	med stf	3.0	14.0
Clayey Silt	Bwn & Gray	stiff-med stf	14.0	20.5
Clayey Silt	Dk Gray	med stf	20.5	21.0

Contractor Name and Address

Name of Driller: Hall Blake and Associates

State License Number: Engineering Registration # 7961

Property owner's name and address

NAS Memphis
Millington, Tennessee

Well depth: 20.0 ft

Datum point from which all measurements are taken: Ground Surface

Method of Drilling: Cable tool; Hollow rod; Driven; Dug; Direct rotary; Air rotary; Bucket auger; Reverse rotary; Jetted; X Flight auger

Use: Domestic; Public supply; Industrial; Irrigation; Municipal; Commercial; X Test Well; Heating or cooling; X Monitoring

Casing Type: Steel; Galv; X PVC; SS; X Threaded; Welded; Solvent welded

Height above/below surface: -0.20

Drive shoe? Yes ___ No X

				Hole diameter
___ in to ___ ft	Wgt ___ lb/ft	Sch No 40		6.75 in to.
___ in to ___ ft	Wgt ___ lb/ft	Sch No ___		___ in to.
___ in to ___ ft	Wgt ___ lb/ft	Sch No ___		___ in to.

Intake Portion of Well

Screen type: Schedule 40 or open hole from ___ ft to ___

Manufacturer ___

Material: PVC Dia: 4-inches

Fittings ___ Length: 14.8 ft

Set between 4.9 ft and 19.7 ft Slot ___

___ ft and ___ ft Slot ___

___ ft and ___ ft Slot ___

Method of installation ___

Filter Pack

Source ___ Gradation: Sand & Pea Gr

Method of installation: poured Composition: silica

Volume used: 140 lbs Depth to top of pk: 3.0 ft

Grout

Used? X Yes ___ No Volume used: 1.0 ft^3

___ Neat Cement ___ Bentonite X cement-sand

Method of installation: poured

Depth from 0.0 ft to 1.0

from ___ ft to ___

Development

Method: hand bailing Duration: 15 min.

Dates: 1/10/87 Sand content after ___ hrs ___

Chemicals used: none

Static Water Level

7.69 ft X below ___ above TOC

Date measured: 1/10/87

Pumping Water Level

N/A ft below ___ above grade Date ___

After ___ hrs pumping at ___ g

Specific Capacity

N/A gpm/ft of drawdown at ___ hour

Date ___

Pump

Date installed: N/A Type ___

Manufacturer ___ Model No ___

HP ___ Volts ___ Capacity ___

Depth of pump intake setting ___ No of stages ___

___ Oil ___ Water lubrication Power source ___

Material of drop pipe ___ bowls ___

shafting ___ impellers ___ Bowl dia ___

Column pipe dia ___ Length ___ Modifications ___

Well Head Completion

Pitless adaptor Basement offset Distance above grade ___

Nearest Sources of Possible Contamination

___ ft Direction ___ Type ___

Well disinfected upon completion? Yes No

Geophysical Logs Run

None

Water Quality

Sample taken? X Yes

Where analyzed: Industrial & Environmental Analysts, Inc.

Date well completed: 1/9/87

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-7 AREA ____

DATE OF INSTALLATION 11-3-87

WELL HOLE DATA

Drill Date 11-3-87

Well Driller Professional Service Ind. (PSI)

Depth of Boring 26.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type N/A

WATER LEVEL DATA (All measurements from top of casing)

Water Level 7.10 ft

Date of Measurement 11-6-87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 55 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log NO

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY PSI

SCCWD# ____

DEVELOPED BY HLA

SCCWD# ____

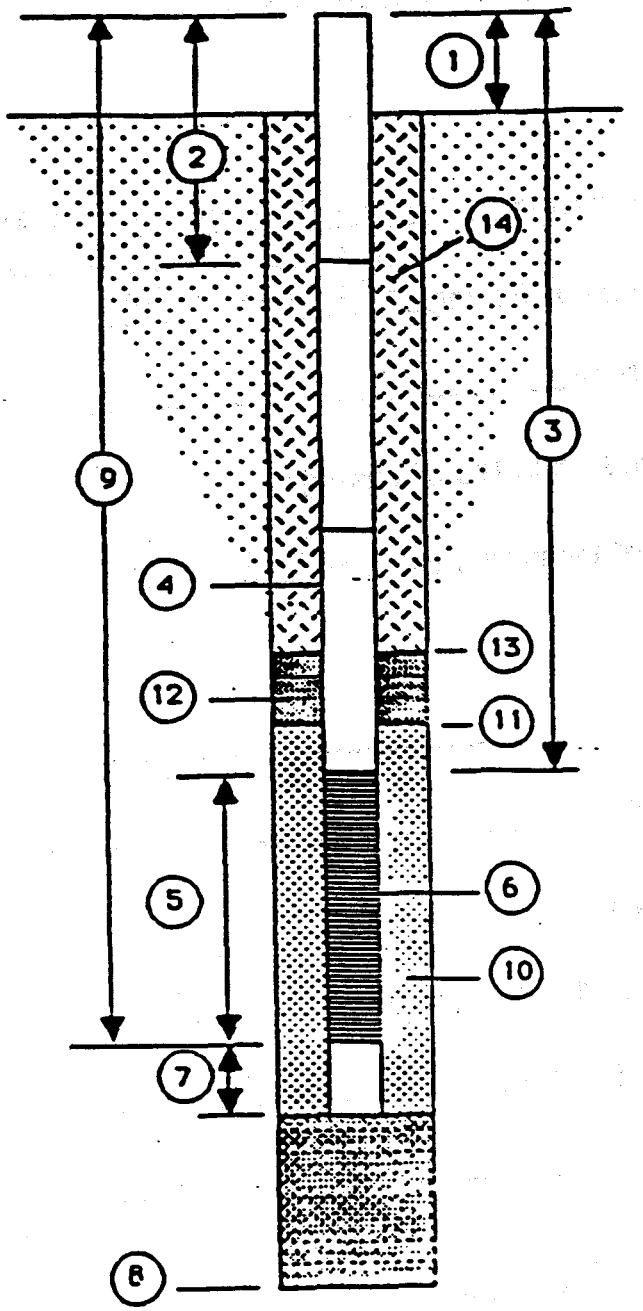
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-7

DATE OF INSTALLATION 11-3-87



1. Height of Casing above ground -0.43 ft (See Plate D1)
2. Depth to first Coupling N/A

   Coupling Interval Depths _____
3. Total Length of Blank Pipe 5.5 ft
4. Type of Blank Pipe Threaded Schedule 40 PVC
5. Length of Screen 20.0 ft
6. Type of Screen Threaded Schedule 40 PVC, 0.020
7. Length of Sump 0.5 ft
8. Total Depth of Boring 26 ft Hole Diameter 6-5/8"
9. Depth To Bottom of Screen 25.5 ft
10. Type of Screen Filter sand

    Quantity Used 1.8 ft^3 Size _____ U/C _____
11. Depth To Top of Filter 2.5 ft
12. Type of Seal bentonite

    Quantity Used 0.688 ft^3
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-bentonite

    Grout Mixture 10% bentonite

    Method of Placement poured

COMMENTS ON INSTALLATION

WELL AND PUMP DATA

Location of Well: MEM-757- 7

County	Township Number	Range Number	Section No.	Fraction	
Shelby	N or S	E or W			¼ ¼ ¼

Property owner's name and address

NAS Memphis
Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections

Exchange Service Station, Navy Road

Show exact location of well in section grid with an 'x' — **Sketch map of well location**

N

S

1 mile

Addition Name
Block Number
Lot Number

Remarks, Elevation, Source of Data, etc.

Elevation of
Top of Casing (TOC): 270.08 ft (msl)

Well depth: 26.0'

Datum point from which all measurements are taken: Ground Surface

Method of Drilling
☐ Cable tool ☐ Hollow rod ☐ Driven ☐ Dug
☐ Direct rotary ☐ Air rotary ☐ Bucket auger ☐ ____
☐ Reverse rotary ☐ Jetted ☒ Flight auger

Use
☐ Domestic ☐ Public supply ☐ Industrial ☐ ____
☐ Irrigation ☐ Municipal ☐ Commercial
☒ Test Well ☐ Heating or cooling ☒ Monitoring

Casing Type
☐ Steel ☒ Threaded
☐ Galv ☐ Welded
☒ PVC ☐ Solvent welded
☐ SS

Height above/below surface 0.43
Drive shoe? Yes ___ No X

					Hole diameter
4 in	to 5.5 ft	Wgt 2.0 lb/ft	Sch No 40		6-5/8 in
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___		___ in
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___		___ in

Intake Portion of Well
Screen type Schedule 40 or open hole from ___ ft to ___
Manufacturer Brainard Kilman
Material PVC Dia 4"
Fittings ___ Length 20.0'
Set between 5.5 ft and 25.5 ft Slot 0.020
___ ft and ___ ft Slot ___
___ ft and ___ ft Slot ___
Method of installation ___

Filter Pack
Source ___ Gradation Sand
Method of installation Poured Composition Silica
Volume used 1.8 ft³ Depth to top of fp 2.5'

Grout
Used? X Yes ☐ No Volume used 1.0 ft³
☐ Neat Cement ☐ Bentonite X cement-bentonite
Method of installation Poured
Depth from 0.5 ft to 1.0
from ___ ft to ___

Development
Method Hand Bailing Duration ___
Dates 11-4-87 Sand content after ___ hrs ___
Chemicals used None

Static Water Level
7.10 ft X below ☐ above TOC
Date measured 11-6-87

Pumping Water Level
N/A ft. below ___ above grade Date ___
After ___ hrs pumping at ___

Specific Capacity
N/A gpm/ft of drawdown at ___ hrs
Date ___

Pump N/A
Date installed ___ Type ___
Manufacturer ___ Model No ___
HP ___ Volts ___ Capacity ___
Depth of pump intake setting ___ No of stages ___
☐ Oil ☐ Water lubrication Power source ___
Material of drop pipe ___ bowls ___
shafting ___ impellers ___ Bowl dia ___
Column pipe dia ___ Length ___ Modifications ___

Well Head Completion
Press adaptor Basement offset Distance above grade ___

Nearest Sources of Possible Contamination
___ ft Direction ___ Type ___
Well disinfected upon completion? Yes No

Geophysical Logs Run

None

Borehole data

Formation Log	Color	Hardness	From	To
ASPHALT	Black	--	0.0	0.4
CLAY & GRAVEL (FILL)	Orange	stiff	0.4	3.0
SILTY CLAY	Greenish Brown	soft to stiff	3.0	8.5
SILTY CLAY	Green Gray	soft to stiff	8.5	13.5
SILT	Lt Gray	stiff	13.5	18.0
CLAYEY SILT	Brownish Green	soft	18.0	19.0
CLAYEY SILT	Lt Gray	soft	19.0	26.0

Contractor Name and Address

Professional Services Industries, Inc.
4161 Ridgemoor Ave., Memphis, TN 38118

Name of Driller ___

State License Number Engineering Registration #15430

Water Quality
Sample taken X Yes
Where analyzed Industrial & Environmental Analysts, Inc.

Date completed 11-3-87

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-8 AREA ____

DATE OF INSTALLATION 11-3-87

WELL HOLE DATA

Drill Date 11-3-87

Well Driller Professional Service Ind. (PSI)

Depth of Boring 25.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type N/A

WATER LEVEL DATA (All measurements from top of casing)

Water Level 8.56 ft

Date of Measurement 11-6-87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 30 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log NO

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY PSI

SCCWD# Engineering Registration #15430

DEVELOPED BY HLA

SCCWD# ____

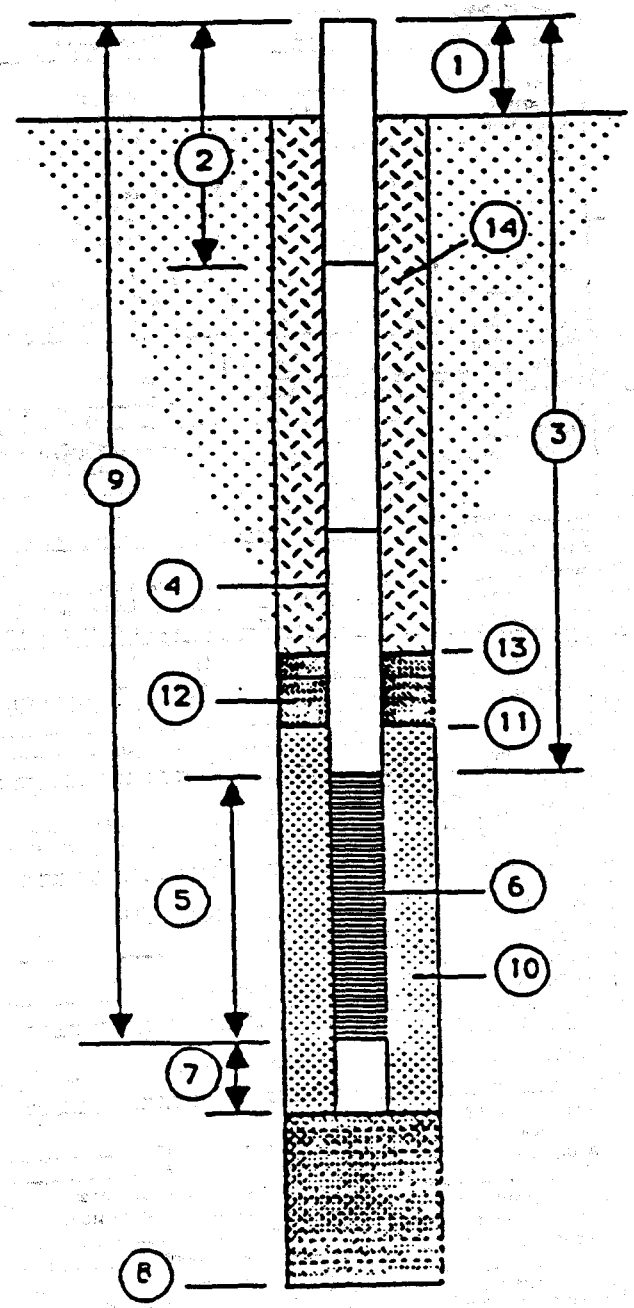
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-8

DATE OF INSTALLATION 11-3-87



1. Height of Casing above ground -0.25 ft (See Plate)
2. Depth to first Coupling N/A

   Coupling Interval Depths _____
3. Total Length of Blank Pipe 5.0 ft
4. Type of Blank Pipe Threaded Schedule 40 PVC
5. Length of Screen 20.0'
6. Type of Screen Threaded Schedule 40 PVC, 0.020
7. Length of Sump --
8. Total Depth of Boring 25.5 ft Hole Diameter 6-5/8"
9. Depth To Bottom of Screen 25.0 ft
10. Type of Screen Filter sand

    Quantity Used 1.5 ft^3 Size _____ U/C _____
11. Depth To Top of Filter 2.5 ft
12. Type of Seal bentonite

    Quantity Used 0.668 ft^3
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-bentonite

    Grout Mixture 10% bentonite

    Method of Placement poured

COMMENTS ON INSTALLATION

WELL AND PUMP DATA

Location of Well MEM-757-8

County	Township Number	Range Number	Section No.	Fraction
Shelby	N or S	E or W		

Property owner's name and address

NAS Memphis
Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections

Exchange Service Station, Navy Road

Show exact location of well in section grid with an 'x' — **Sketch map of well location**

N — S — 1 mile

Addition Name

Block Number

Lot Number

Remarks, Elevation, Source of Data, etc.

Elevation of
Top of Casing (TOC): 270.98 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
ASPHALT	Black	--	0.0	0.4
CLAY	Orange	stiff	0.4	3.0
SILTY CLAY	Medium Gray	soft to m stiff	3.0	8.5
SILTY CLAY	Gray	soft	8.5	14.0
CLAYEY SILT	Lt Brown	soft	14.0	18.5
CLAYEY SILT	Lt. Gray & Brown	soft	18.5	23.5
CLAYEY SILT	Lt. Brown	stiff	23.5	24.5
SILTY CLAY	Gray	stiff	24.5	25.5

Well depth 25.5'

Datum point from which all measurements are taken Ground Surface

Method of Drilling
[ ] Cable tool [ ] Hollow rod [ ] Driven [ ] Dug
[ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] ____
[ ] Reverse rotary [ ] Jetted [X] Flight auger

Use
[ ] Domestic [ ] Public supply [ ] Industrial [ ] ____
[ ] Irrigation [ ] Municipal [ ] Commercial
[X] Test Well [ ] Heating or cooling [X] Monitoring

Casing Type
[ ] Steel [X] Threaded Height above/below surface 0.26
[ ] Galv [ ] Welded Drive shoe? Yes ___ No X
[X] PVC [ ] Solvent welded
[ ] SS

					Hole size
4 in	to 5.5 ft	Wgt 2.0 lb/ft	Sch No 40	6-5/8 in	
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___	___ in	
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___	___ in	

Intake Portion of Well
Screen type Schedule 40 open hole from ___ ft to ___
Manufacturer Brainard Kilman
Material PVC Dia 4"
Fittings Length 20.0'
Set between 5.5 ft and 25.0 ft Slot 0.020
___ ft and ___ ft Slot ___
___ ft and ___ ft Slot ___
Method of installation ___

Filter Pack
Source ___ Gradation Sand
Method of installation Poured Composition Silica
Volume used 1.5 ft³ Depth to top of fp 2.5 f

Grout
Used? X Yes [ ] No Volume used 1.0 ft³
[ ] Neat Cement [ ] Bentonite X cement-bentoni
Method of installation Poured
Depth from 0.5 ft to 1.0
from ___ ft to ___

Development
Method Hand Bailing Duration ___
Dates 11-4-87 Sand content after ___ hrs ___
Chemicals used None

Static Water Level
8.56 ft X below [ ] above grade TOC
Date measured 11-6-87

Pumping Water Level
N/A ft below ___ above grade Date ___
After ___ hrs pumping at ___

Specific Capacity
N/A gpm/ft of drawdown at ___ ho
Date ___

Pump N/A
Date installed ___ Type ___
Manufacturer ___ Model No ___
H.P. ___ Volts ___ Capacity ___
Depth of pump intake setting ___ No. of stages ___
[ ] Oil [ ] Water lubrication Power source ___
Material of drop pipe ___ bowls ___
shafting ___ impellers ___ Bowl dia ___
Column pipe dia ___ Length ___ Modifications ___

Well Head Completion
Pitless adaptor Basement offset Distance above grade ___

Nearest Sources of Possible Contamination
___ ft Direction ___ Type ___
Well disinfected upon completion? Yes No

Geophysical Logs Run

None

Contractor Name and Address

Professional Services Industries, Inc.
4161 Ridgemoor Ave., Memphis, TN 38118

Name of Driller ___

State License Number Engineering Registration #15430

Water Quality
Sample taken? X Yes
Where analyzed Industrial & Environmental Analysts, Inc.

Date well completed 11-3-87

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-9 AREA ____

DATE OF INSTALLATION 11-4-87

WELL HOLE DATA

Drill Date 11-4-87

Well Driller Professional Service Ind. (PSI)

Depth of Boring 26.0 ft.

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type N/A

WATER LEVEL DATA (All measurements from top of casing)

Water Level 10.59 ft

Date of Measurement 11-6-87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 45 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log NO

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY PSI

SCCWD# Engineering Registration #15430

DEVELOPED BY HLA

SCCWD# ____

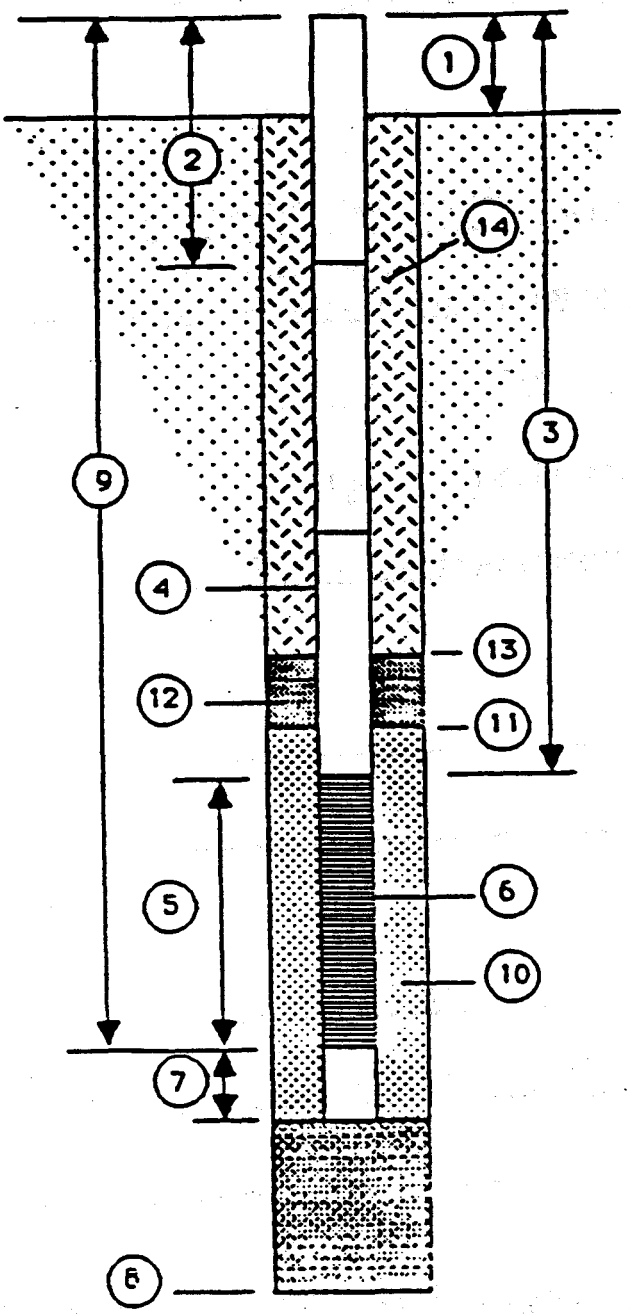
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O BOX 10068
CHARLESTON S.C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-9

DATE OF INSTALLATION 11-4-87



1. Height of Casing above ground -0.30 ft (See Plate D1)
2. Depth to first Coupling N/A

   Coupling Interval Depths _____
3. Total Length of Blank Pipe 5.5 ft
4. Type of Blank Pipe Threaded Schedule 40 PVC
5. Length of Screen 20.0 ft
6. Type of Screen Threaded Schedule 40 PVC, 0.020
7. Length of Sump 0.5 ft
8. Total Depth of Boring 26 ft Hole Diameter 6-5/8"
9. Depth To Bottom of Screen 25.5 ft
10. Type of Screen Filter sand

    Quantity Used 2.2 ft^3 Size _____ U/C _____
11. Depth To Top of Filter 3.0 ft
12. Type of Seal bentonite

    Quantity Used 0.688 ft^3
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-bentonite

    Grout Mixture 10% bentonite

    Method of Placement poured

COMMENTS ON INSTALLATION

WELL AND PUMP DATA

Location of Well MEM-757- 9

County	Township	Township Number	Range Number	Section No.	Fraction
Shelby		N or S	E or W		

Street Address and City or Distance and Direction from Road Intersections

Exchange Service Station, Navy Road

Show exact location of well in section grid with an 'x' — **Sketch map of well location**

N

S

1 mile

Addition Name
Block Number
Lot Number

Remarks, Elevation, Source of Data, etc.

Elevation of
Top of Casing (TOC): 271.06 ft (MSL)

Borehole data

Formation Log	Color	Hardness	From	To
CONCRETE	White	--	0.0	0.4
SILTY CLAY	Dk Green Gray	stiff	0.4	8.5
CLAYEY SILT	Gray	stiff	8.5	13.5
CLAYEY SILT	Lt Grayish Brown	stiff	13.5	18.5
CLAYEY SILT	Lt Brown	stiff	18.5	23.5
CLAYEY SILT	Gray	stiff	23.5	26.0

Contractor Name and Address

Professional Services Industries, Inc.
4161 Ridgemoor Ave., Memphis, TN 38118

Name of Driller

Engineering Registration Number

Property owner's name and address

NAS Memphis
Millington, Tennessee

Well depth 26.0'

Datum point from which all measurements are taken Ground Surface

Method of Drilling
☐ Cable tool ☐ Hollow rod ☐ Driven ☐ Dug
☐ Direct rotary ☐ Air rotary ☐ Bucket auger ☐ ____
☐ Reverse rotary ☐ Jetted ☒ Flight auger

Use
☐ Domestic ☐ Public supply ☐ Industrial ☐ ____
☐ Irrigation ☐ Municipal ☐ Commercial
☒ Test Well ☐ Heating or cooling ☒ Monitoring

Casing Type
☐ Steel ☒ Threaded Height above/below surface 0.30
☐ Galv ☐ Welded
☒ PVC ☐ Solvent welded Drive shoe? Yes ___ No X
☐ SS

4 in	to 5.5 ft	Wgt 2.0 lb/ft	Sch No 40	Hole diameter 6-5/8 in
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___	___ in
___ in	to ___ ft	Wgt ___ lb/ft	Sch No ___	___ in

Intake Portion of Well
Screen type Schedule 40 or open hole from ___ ft to ___
Manufacturer Brainard Kilman
Material PVC Dia ___
Fittings ___ Length ___
Set between 5.5 ft and 25.5 ft Slot 0.020
___ ft and ___ ft Slot ___
___ ft and ___ ft Slot ___
Method of installation ___

Filter Pack
Source ___ Gradation Sand
Method of installation Poured Composition Silica
Volume used 2.2 ft³ Depth to top of FP 3.0'

Grout
Used? ☒ Yes ☐ No Volume used 1.0 ft³
☐ Neat Cement ☐ Bentonite ☒ cement-bentonite
Method of installation Poured
Depth from 0.5 ft to 1.0
from ___ ft to ___

Development
Method Hand Bailing Duration ___
Dates 11-5-87 Sand content after ___ hrs ___
Chemicals used None

Static Water Level
10.59 ft ☒ below ☐ above grade TOC
Date measured 11-6-87

Pumping Water Level
N/A ft ☐ below ☐ above grade Date ___
After ___ hrs pumping at ___

Specific Capacity
N/A gpm/ft of drawdown at ___ hrs
Date ___

Pump N/A
Date installed ___ Type ___
Manufacturer ___ Model No ___
H P ___ Volts ___ Capacity ___
Depth of pump intake setting ___ No of stages ___
☐ Oil ☐ Water lubrication Power source ___
Material of drop pipe ___ bowls ___
shafting ___ impellers ___ Bowl dia ___
Column pipe dia ___ Length ___ Modifications ___

Well Head Completion
Pitless adaptor Basement offset Distance above grade ___

Nearest Sources of Possible Contamination
___ ft Direction ___ Type ___
Well disinfected upon completion? Yes No

Geophysical Logs Run

None

Water Quality
Sample taken? ☒ Yes
Where analyzed Industrial & Environmental Analysts, Inc.

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-10 AREA ____

DATE OF INSTALLATION 11-4-87

WELL HOLE DATA

Drill Date 11-4-87

Well Driller Professional Service Ind. (PSI)

Depth of Boring 26.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type N/A

WATER LEVEL DATA (All measurements from top of casing)

Water Level 8.30 ft

Date of Measurement 11-6-87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 20 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log NO

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY PSI

SCCWD# Engineering Registration #15430

DEVELOPED BY HLA

SCCWD# ____

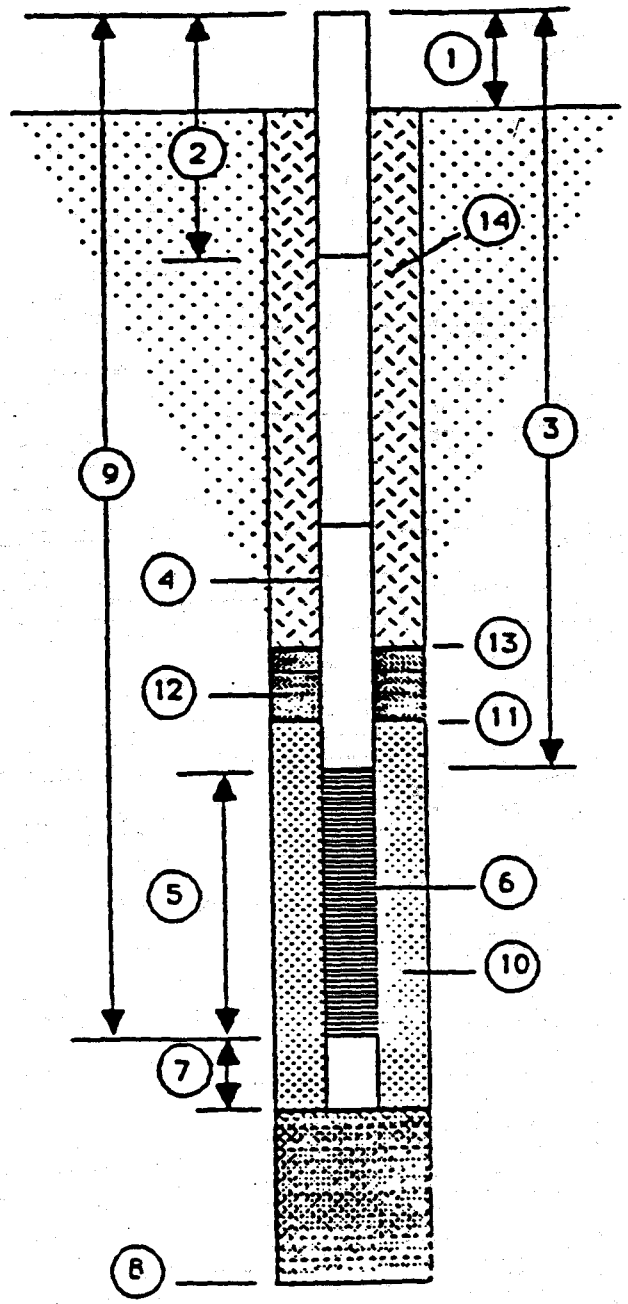
TECHNICAL OVERSIGHT BY HLA

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O BOX 10068
CHARLESTON S.C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-10

DATE OF INSTALLATION 11-4-87



1. Height of Casing above ground 0.44 ft (See Plate D
2. Depth to first Coupling N/A

   Coupling Interval Depths _____
3. Total Length of Blank Pipe 5.5 ft
4. Type of Blank Pipe Threaded Schedule 40 PVC
5. Length of Screen 20.0 ft
6. Type of Screen Threaded Schedule 40 PVC, 0.020
7. Length of Sump 0.5 ft
8. Total Depth of Boring 26 ft Hole Diameter 6-5/8"
9. Depth To Bottom of Screen 25.5 ft
10. Type of Screen Filter sand

    Quantity Used 1.67 ft^3 Size _____ U/C _____
11. Depth To Top of Filter 3.5 ft
12. Type of Seal bentonite

    Quantity Used 0.668 ft^3
13. Depth To Top of Seal 1.0 ft
14. Type of Grout cement-bentonite slurry

    Grout Mixture 10% bentonite

    Method of Placement poured

COMMENTS ON INSTALLATION

WELL AND PUMP DATA

Location of Well MEM-757-10

County: Shelby | Township | Township Number N or S | Range Number E or W | Section No. | Fraction

Property owner's name and address

NAS Memphis
Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections

xchange Service Station, Navy Road

Show exact location of well in section grid with an 'x' — **Sketch map of well location**

N — S — 1 mile

Addition Name

Block Number

Lot Number

Well depth 26.0' | **Datum point from which all measurements are taken**

Method of Drilling
[ ] Cable tool [ ] Hollow rod [ ] Driven [ ] Dug
[ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] ____
[ ] Reverse rotary [ ] Jetted [X] Flight auger

Use
[ ] Domestic [ ] Public supply [ ] Industrial [ ] ____
[ ] Irrigation [ ] Municipal [ ] Commercial
[X] Test Well [ ] Heating or cooling [X] Monitoring

Casing Type
[ ] Steel [X] Threaded
[ ] Galv [ ] Welded
[X] PVC [ ] Solvent welded
[ ] SS

Height above/below surface 0.44
Drive shoe? Yes ___ No X

4 in to 5.5 ft Wgt 2.0 lb/ft Sch No 40 — Hole diameter 6-5/8 in
___ in to ___ ft Wgt ___ lb/ft Sch No ___
___ in to ___ ft Wgt ___ lb/ft Sch No ___

Remarks, Elevation, Source of Data, etc.

Elevation of
Top of Casing (TOC): 271.16 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
CONCRETE	White	--	0.0	0.4
SILTY CLAY	Brown	stiff	0.4	3.0
SILTY CLAY	Grayish Brn	stiff	3.0	8.5
SILTY CLAY	Brown	v. soft	8.5	13.5
CLAYEY SILT	Gray & Brn	soft to m stiff	13.5	18.5
CLAYEY SILT	Brown	soft to m stiff	18.5	23.5
CLAYEY SILT	Gray	soft to m stiff	23.5	26.0

Intake Portion of Well
Screen type Schedule 40 — open hole from ___ ft to ___
Manufacturer Brainard Kilman
Material PVC — Dia 4"
Fittings ___ — Length 20'
Set between 5.5 ft and 25.5 ft Slot 0.020
___ ft and ___ ft Slot ___
___ ft and ___ ft Slot ___
Method of installation ___

Filter Pack
Source ___ — Gradation Sand
Method of installation Poured — Composition Silica
Volume used 1.67 ft³ — Depth to top of pack 3.0

Grout
Used? X Yes [ ] No — Volume used 1.0 ft³
[ ] Neat Cement [ ] Bentonite X cement-bentonite
Method of installation Poured
Depth from 0.5 ft to 1.0
from ___ ft to ___

Development
Method Hand Bailing — Duration ___
Dates 11-5-87 — Sand content after ___ hrs ___
Chemicals used None

Static Water Level
8.30 ft X below [ ] above TOC
Date measured 11-6-87

Pumping Water Level
N/A ft below ___ above grade Date ___
After ___ hrs pumping at ___

Specific Capacity
N/A gpm/ft of drawdown at ___ hrs
Date ___

Pump N/A
Date installed ___ Type ___
Manufacturer ___ Model No ___
H P ___ Volts ___ Capacity ___
Depth of pump intake setting ___ No of stages ___
[ ] Oil [ ] Water lubrication Power source ___
Material of drop pipe ___ bowls ___
shafting ___ impellers ___ Bowl dia ___
Column pipe dia ___ Length ___ Modifications ___

Well Head Completion
Pitless adaptor Basement offset Distance above grade ___

Nearest Sources of Possible Contamination
___ ft Direction ___ Type ___
Well disinfected upon completion? Yes No

Geophysical Logs Run

None

Contractor Name and Address

Professional Services Industries, Inc.
4161 Ridgemoor Ave., Memphis, TN 38118

Name of Driller ___

Water Quality
Sample taken? X Yes
Where analyzed Industrial & Environmental Analysts, Inc.

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-11 AREA ____

DATE OF INSTALLATION 11-5-87

WELL HOLE DATA

Drill Date 11-5-87

Well Driller Professional Service Ind. (PSI)

Depth of Boring 26.0 ft

Purpose of Boring Soil Sampling and Monitoring Well Installation

Drilling Method Hollow Stem Auger

Mud Type N/A

WATER LEVEL DATA (All measurements from top of casing)

Water Level 11.61 ft.

Date of Measurement 11-6-87

DEVELOPMENT DATA

Development Method Hand Bailing

Length of Time Developed 10 minutes

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log NO

Physical Core X

Cutting Samples X

Water Level Observations ____

DRILLED BY PSI

SCCWD# Engineering Registration #15430

DEVELOPED BY HLA

SCCWD# ____

TECHNICAL OVERSIGHT BY HLA

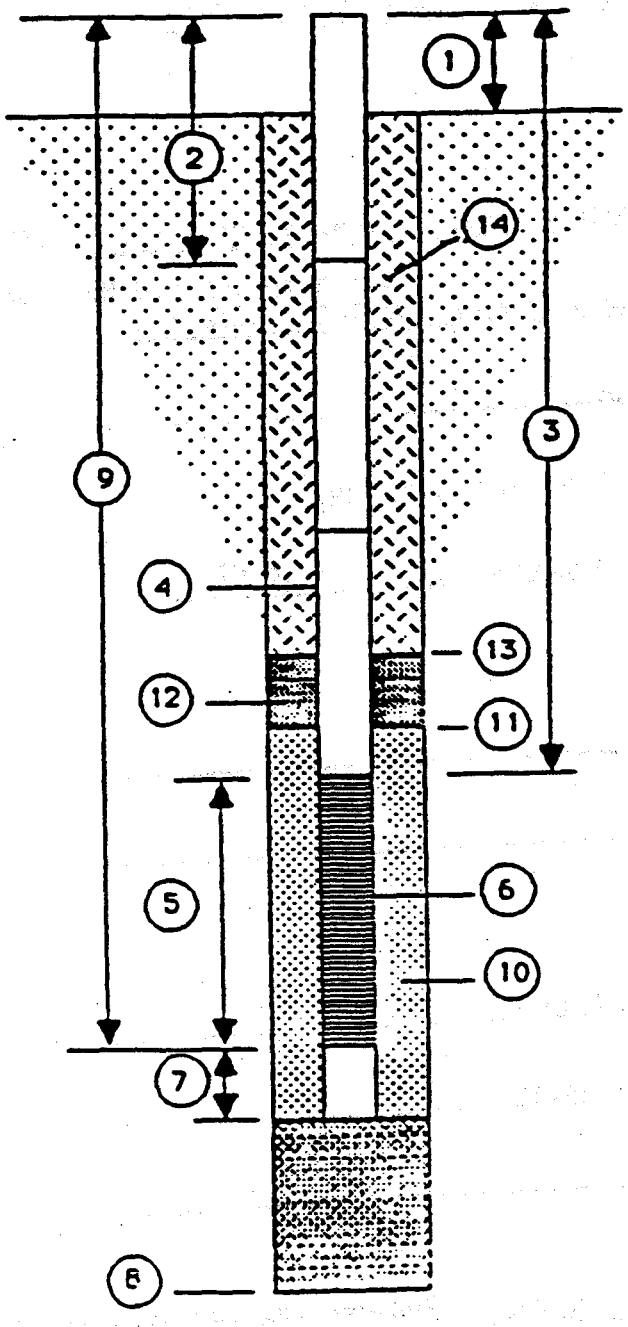
DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-757-11

DATE OF INSTALLATION 11-5-87

(See Plate D1)



1. Height of Casing above ground -0.29 ft
2. Depth to first Coupling N/A

   Coupling Interval Depths

3. Total Length of Blank Pipe 5.5 ft
4. Type of Blank Pipe Threaded Schedule 40 PVC
5. Length of Screen 20.0 ft
6. Type of Screen Threaded Schedule 40 PVC, 0.020
7. Length of Sump 0.5 ft
8. Total Depth of Boring 26 ft Hole Diameter 6-5/8"
9. Depth To Bottom of Screen 25.5 ft
10. Type of Screen Filter sand

    Quantity Used 2.0 ft^3 Size____ U/C____
11. Depth To Top of Filter 3.0 ft
12. Type of Seal bentonite

    Quantity Used 0.668 ft^3
13. Depth To Top of Seal 1.5 ft
14. Type of Grout cement-bentonite slurry

    Grout Mixture 10% bentonite

    Method of Placement poured

COMMENTS ON INSTALLATION

Location of Well: MEM-757-11

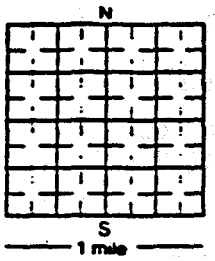
County	Township Number	Range Number	Section No.	Fraction	
Shelby	N or S	E or W			¼ ¼ ¼

Township:

Property owner's name and address: NAS Memphis, Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections: Exchange Service Station, Navy Road

Show exact location of well in section grid with an 'x'



Addition Name

Block Number

Lot Number

Sketch map of well location

Remarks, Elevation, Source of Data, etc.

Elevation of
Top of Casing (TOC): 271.22 ft (msl)

Borehole data

Formation Log	Color	Hardness	From	To
ASPHALT	Black	--	0	0.4
SILTY CLAY	Gray	soft	0.4	9.0
SILTY CLAY	Gray & Brown	soft to m stiff	9.0	13.5
CLAYEY SILT	Lt Gray	soft to m stiff	13.5	18.5
CLAYEY SILT	Lt Brown	soft to m stiff	18.5	23.5
CLAYEY SILT	Med Gray	stiff	23.5	26.0

Well depth: 26.0'

Datum point from which all measurements are taken: Ground Surface

Method of Drilling: [ ] Cable tool [ ] Hollow rod [ ] Driven [ ] Du; [ ] Direct rotary [ ] Air rotary [ ] Bucket auger [ ] ___; [ ] Reverse rotary [ ] Jetted [X] Flight auger

Use: [ ] Domestic [ ] Public supply [ ] Industrial [ ] ___; [ ] Irrigation [ ] Municipal [ ] Commercial; [X] Test Well [ ] Heating or cooling [X] Monitoring

Casing Type: [ ] Steel [X] Threaded [ ] Galv [ ] Welded [X] PVC [ ] Solvent welded [ ] SS; Height above/below surface 0.29; Drive shoe? Yes ___ No X

Dia		Wgt		Sch No	
4 in	to 5.5 ft	2.0	lb/ft	40	6-57
___ in	to ___ ft	___	lb/ft	___	
___ in	to ___ ft	___	lb/ft	___	

Intake Portion of Well: Screen type Schedule 40 or open hole from ___ ft to ___; Manufacturer Brainard Kilman; Material PVC; Dia 4"; Fittings; Length 20.0'; Set between 5.5 ft and 25.5 ft; Slot 0.020; ___ ft and ___ ft; Slot ___; ___ ft and ___ ft; Slot ___; Method of installation ___

Filter Pack: Source ___; Gradation Sand; Method of installation Poured; Composition Sili; Volume used 2.0 ft3; Depth to top of fp 3.

Grout: Used? [X] Yes [ ] No; Volume used 1.0 ft3; [ ] Neat Cement [ ] Bentonite [X] cement-bentonite; Method of installation Poured; Depth from 0.5 ft to 1.5; from ___ ft to ___

Development: Method Hand Bailing; Duration ___; Dates 11-5-87; Sand content after ___ hrs; Chemicals used None

Static Water Level: 11.61 ft [X] below [ ] above grade TOC; Date measured 11-6-87

Pumping Water Level: N/A ft [ ] below [ ] above grade; Date ___; After ___ hrs pumping at ___

Specific Capacity: N/A gpm/ft of drawdown at ___; Date ___

Pump: N/A; Date installed ___; Type ___; Manufacturer ___; Model No ___; HP ___; Volts ___; Capacity ___; Depth of pump intake setting ___; No of stages ___; [ ] Oil [ ] Water lubrication; Power source ___; Material of drop pipe ___; bowls ___; shafting ___; impellers ___; Bowl dia ___; Column pipe dia ___; Length ___; Modifications ___

Well Head Completion: Pitless adaptor; Basement offset; Distance above grade ___

Nearest Sources of Possible Contamination: ___ ft; Direction ___; Type ___; Well disinfected upon completion? [ ] Yes [ ] No

Geophysical Logs Run: None

Contractor Name and Address: Professional Services Industries, Inc., 4161 Ridgemoor Ave., Memphis, TN 38118

Name of Driller ___

State License [illegible] Engineerin[illegible]

Water Quality: Sample taken? [X] Yes; Where analyzed Industrial & Environmental Analysts, Inc.

GROUNDWATER MONITORING

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A4 LOG OF WELL NO. MEM-757-12

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			ASPHALT	FLUSH MOUNTED MANHOLE COVER; 2' x 2' x 6" CONCRETE PAD
			1.0 GRAVEL	0.0 LOCKING WELL CAP; CEMENT GROUT MIXTURE
			CLAY SILTY GRAY PETROLEUM ODOR	6" PVC RISER
			4.2 CLAY BROWN PETROLEUM ODOR	5.0
5			5.7	BENTONITE SEAL
			CLAY SILTY GRAY STRONG PETROLEUM ODOR	7.0
			9.9	FLUSH THREADED JOINT
10				10.0
				6" PVC SCREEN #10 SLOT
15			SILT GRAY BROWN ODOR	
			19.6	
20			SILT GRAY NO ODOR	20.0 FILTER PACK #16/32 SILICA
			23.0	23.0
25			SILT CLAYEY GRAY	25.0 BENTONITE SEAL; SOIL GROUT MIXTURE
				29.5
30			30.0 TERMINATED @ 30.0	BOTTOM OF WELL 30.0'

Boring Completion Date: MAY 31, 1990

Well Completion Date: JUNE 1, 1990

Well Development Date: JUNE 2, 1990

Drilling Method: AUGER

Depth to Water: ≈ 4.0'

Boring Diameter: 6.25"

Ground Elevation:

Top of Casing Elevation:

Driller: A. DAVIS

Logged by: C. RUTHERFORD

Soil Boring Log / Well Log

Vacuum Extraction Stu
and Remedial Investig
NAS Memphis, Tn
November, 1990

GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A5 LOG OF WELL NO. MEM-757-13

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			ASPHALT .2	FLUSH MOUNTED MANHOLE COVER; 2' x 2' x 6" CONCRETE PAD; 0.0
			1.0 GRAVEL	LOCKING WELL CAP; CEMENT GROUT MIXTURE
			CLAY SILTY GRAY WITH PETROLEUM ODOR	4" PVC RISER
5			5.0	5.0 BENTONITE SEAL; 7.0
			SILT GRAY PETROLEUM ODOR	9.0 FLUSH THREADED JOINT
10			10.1	4" PVC SCREEN #10 SLOT; 13.0
15			SILT GRAY BROWN NO ODOR	FILTER PACK #16/32 SIZE SILICA; 15.0 BENTONITE SEAL; 17.0
20			20.0	SOIL GROUT MIXTURE
25			SILTY CLAYEY GRAY NO ODOR	29.5
30			30.0 TERMINATED @ 30.0	BOTTOM OF WELL 30.0'

Boring Completion Date: JUNE 1, 1990
Well Completion Date: JUNE 1, 1990
Well Development Date: JUNE 2, 1990
Drilling Method: AUGER
Depth to Water: ≈ 4.0'

Boring Diameter: 6.25"
Ground Elevation:
Top of Casing Elevation:
Driller: A. DAVIS
Logged by: C. RUTHERFORD

Soil Boring / Well Log

Vacuum Extraction Study and Remedial Investigation
NAS Memphis, Tn
November, 1990

SOUTHERN DIVISION NAVAL FACILITIES

GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A7 LOG OF WELL NO. MEM-757-14

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			ASPHALT .3 / GRAVEL .5	BRASS ID MARKER; FLUSH MOUNTED MANHOLE COVER; 2' x 2' x 6" CONCRETE PAD; 0.0 LOCKING WELL CAP; CEMENT GROUT MIXTURE
5			CLAY SILTY GRAY PETROLEUM ODOR — 6.5	4" PVC RISER; 6.0 BENTONITE SEAL; 8.0
			SILT GRAY PETROLEUM ODOR — 10.1	FLUSH THREADED JOINT; 10.0
10			SILT GRAY BROWN PETROLEUM ODOR — 13.0	4" PVC SCREEN #10 SLOT; 14.0 FILTER PACK #16/32 SIZE SILICA; 16.0 BENTONITE SEAL; 18.0
15			SILT GRAY BROWN NO ODOR — 19.0	
20			SILT GRAY — 29.0	SOIL GROUT MIXTURE; 28.5
25				
30			TERMINATED @ 29.0	BOTTOM OF WELL 29.0'

Boring Completion Date: JUNE 4, 1990
Well Completion Date: JUNE 4, 1990
Well Development Date: JUNE 4, 1990
Drilling Method: AUGER
Depth to Water: ≈4.0'

Boring Diameter: 6.25"
Ground Elevation:
Top of Casing Elevation:
Driller: A. DAVIS
Logged by: C. RUTHERFORD

Soil Boring / Well Log

Vacuum Extraction St
and Remedial Investigatio
NAS Memphis, Tn
November, 1990

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A16 LOG OF WELL NO. MEM 757-15

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			ASPHALT GRAVEL	FLUSH MOUNTED MANHOLE COVER 2' x 2' x 6" CONCRETE PAD 0.0 LOCKING WELL CAP
			1.0 SILT CLAYEY GRAY	1.0 CEMENT GROUT MIXTURE BENTONITE SEAL
			SILT CLAYEY GRAY-BROWN	3.0 4" PVC RISER 5.0 FLUSH THREADED JOINT
5			7.0 SILT CLAYEY GRAY-BROWN	FILTER PACK #16 SIZE SILICA
			9.0 SILT CLAYEY GRAY-BROWN	
10			15.0	4" PVC SCREEN #10 SLOT 14.5 BOTTOM OF WELL 15.0'
15			SILT GRAY	
20			21.0 TERMINATED @ 21.0	
25				

Boring Completion Date: JUNE 5, 1990

Well Completion Date: JUNE 13, 1990

Well Development Date: JUNE 14, 1990

Drilling Method: AUGER

Depth to Water: ≈4.0

Boring Diameter: 6.25"

Ground Elevation:

Top of Casing Elevation:

Driller: A. DAVIS

Logged by: C. RUTHERFORD

Soil Boring / Well Log

Vacuum Extraction Study and Remedial Investigation
NAS Memphis, Tn
November, 1990

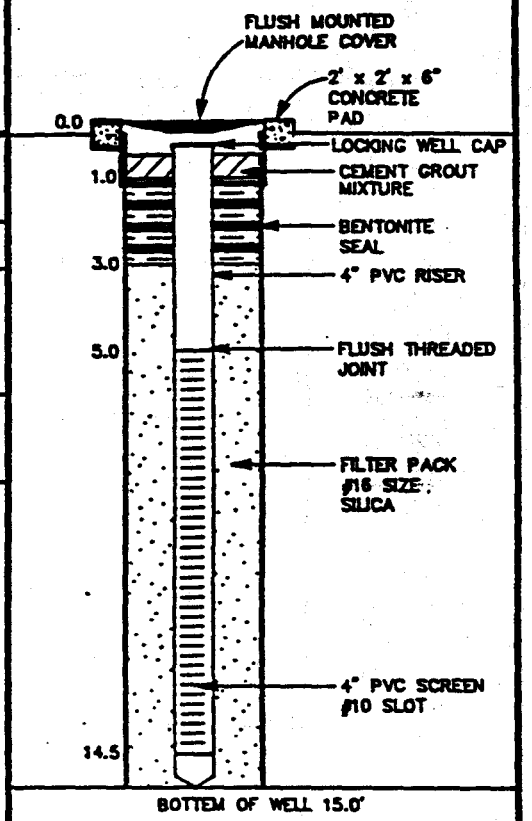
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A14 LOG OF WELL NO. MEM 757-16

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			TOPSOIL CLAY SILTY BROWN (1.0)
			CLAY SILTY BROWN (3.1)
5			SILT CLAYEY BROWN–GRAY (6.0)
			SILT BROWN–GRAY (8.0)
10			SILT BROWN–GRAY (18.2)
15			
20			SILT GRAY (21.0)
			TERMINATED @ 21 0
25			

WELL CONSTRUCTION



Boring Completion Date: JUNE 5, 1990
Well Completion Date: JUNE 13, 1990
Well Development Date: JUNE 14, 1990
Drilling Method: AUGER
Depth to Water: ≈4.0

Boring Diameter: 6.25"
Ground Elevation:
Top of Casing Elevation:
Driller: A. DAVIS
Logged by: C. RUTHERFORD

Soil Boring / Well Log

Vacuum Extraction St[illegible]
and Remedial Investig[illegible]or
NAS Memphis, Tn
November, 1990

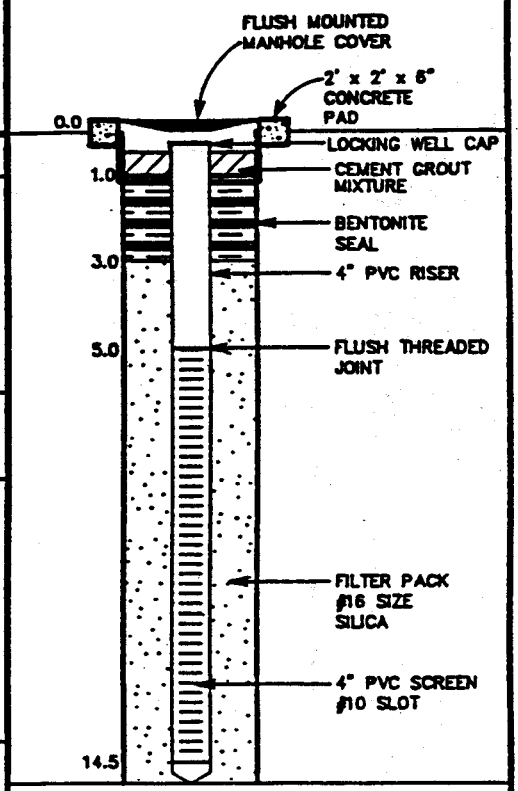
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A3 LOG OF WELL NO. MEM 757-17

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			1.0 TOPSOIL
5			CLAY SILTY BROWN
			6.0
			CLAY SILTY BROWN
			8.0
10			SILT GRAY BROWN
			14.0
15			SILT OCCASIONAL GRAVEL
			19.0
20			SILT GRAY
			21.0
			TERMINATED @ 21.0
25			

WELL CONSTRUCTION



Boring Completion Date: MAY 31, 1990

Well Completion Date: JUNE 13, 1990

Well Development Date: JUNE 14, 1990

Drilling Method: AUGER

Depth to Water: ≈ 4.0

Boring Diameter: 6.25"

Ground Elevation:

Top of Casing Elevation:

Driller: A. DAVIS

Logged by: C. RUTHERFORD

Soil Boring / Well Log

Vacuum Extraction Study
and Remedial Investigation
NAS Memphis, Tn
November, 1990

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

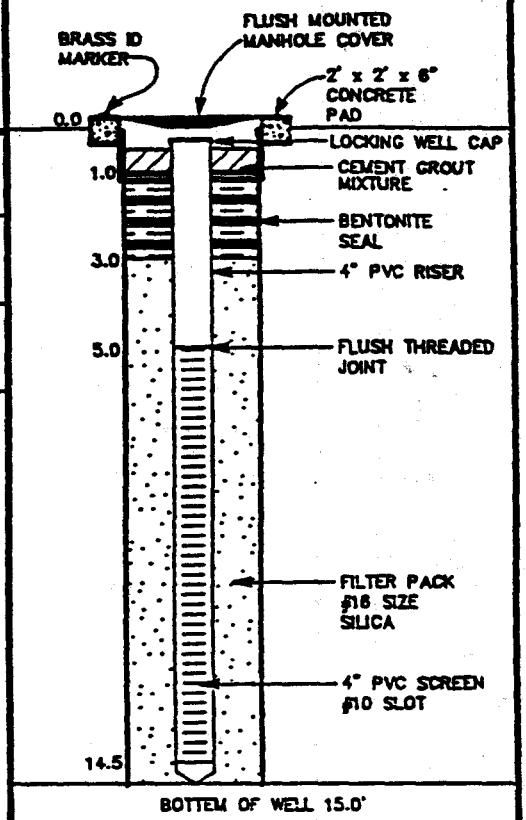
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A24 LOG OF WELL NO. MEM-757-18

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			TOPSOIL CLAY SILTY BROWN
			2.0
			SILT CLAYEY BROWN
			4.0
5			SILT CLAYEY GRAY WET
			6.0
10			SILT GRAY-BROWN
15			17.0
			TERMINATED @ 17.0
20			
25			

WELL CONSTRUCTION



Boring Completion Date: JUNE 8, 1990
Well Completion Date: JUNE 13, 1990
Well Development Date: JUNE 14, 1990
Drilling Method: AUGER
Depth to Water: ≈4.0

Boring Diameter: 6.25"
Ground Elevation:
Top of Casing Elevation:
Driller: A. DAVIS
Logged by: C. RUTHERFORD

Soil Boring Log

Vacuum Extraction St[illegible]
and Remedial Investigation
NAS Memphis, Tn
November, 1990

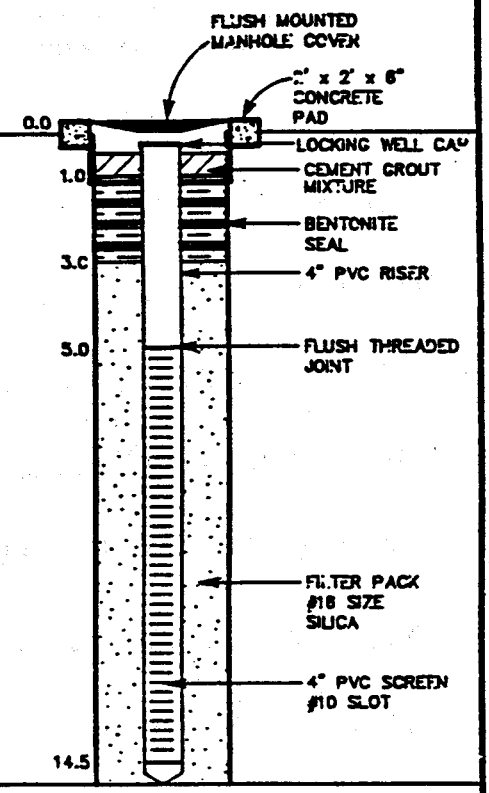
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION NAVY EXCHANGE SERVICE STATION

LOG OF BORING NO. A28 LOG OF WELL NO. MEM-757-19

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			TOPSOIL CLAY SILTY BROWN
			2.0
			SILT CLAYEY BROWN-GRAY
5			5.3
10			SILT BROWN-GRAY
15			17.0
			TERMINATED @ 17.0
20			
25			

WELL CONSTRUCTION



Boring Completion Date: JUNE 11, 1990

Well Completion Date: JUNE 13, 1990

Well Development Date: JUNE 14, 1990

Drilling Method: AUGER

Depth to Water: ≈ 4.0

Boring Diameter: 6.25"

Ground Elevation:

Top of Casing Elevation:

Driller: A. DAVIS

Logged by: C. RUTHERFORD

Soil Boring / Well Log

Vacuum Extraction Study and Remedial Investigatio
NAS Memphis, Tn
November, 1990

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON, S C. 29411-0068

WELL DATA REPORT

WELL NUMBER MEM-757-SB1 AREA

DATE OF INSTALLATION 11/3/87

WELL HOLE DATA

Drill Date 11/3/87

Well Driller Professional Services Ind. (PSI)

Depth of Boring 15.0 ft.

Purpose of Boring Soil Sampling

Drilling Method Hollow Stem Auger

Mud Type N/A

WATER LEVEL DATA (All measurements from top of casing)

Water Level N/A

Date of Measurement N/A

DEVELOPMENT DATA

Development Method N/A

Length of Time Developed N/A

LOCATION OF BOREHOLE INFORMATION

Drillers Log X

Geophysical Log NO

Physical Core X

Cutting Samples X

Water Level Observations

DRILLED BY PSI

SCCWD# Engineering Registration #15430

DEVELOPED BY N/A

SCCWD#

TECHNICAL OVERSIGHT BY HLA

Location of Well: MEM-757-SB1

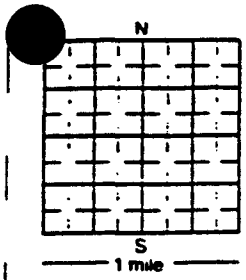
County	Township Number	Range Number	Section No.	Fraction
Shelby	N or S	E or W		

Township

MAS-Memphis
Millington, Tennessee

Street Address and City or Distance and Direction from Road Intersections

Exact location of well in section grid with an 'x'



Sketch map of well location

Addition Name

Block Number

Lot Number

Remarks, Elevation, Source of Data, etc.

Borehole data

Formation Log	Color	Hardness	From	To
Asphalt	Black	--	0.0	0.4
Clay & Gravel (Fill)	Orange	Stiff	0.4	3.0
Silty Clay	Dk Grayish Brown	Soft to M.stiff	3.0	8.5
Silty Clay	Grayish Green	Soft to M. stiff	8.5	14.0
Clayey Silt	Gray & Bwn	Stiff	14.0	15.0

Contractor Name and Address
Professional Services Industries, Inc.
4161 Ridgemont Ave. Memphis, TN 38118

Name of Driller

State License Number: Engineering Registration #15430

Well depth

Datum point from which all measurements are taken: Ground Surface

Method of Drilling
☐ Cable tool ☐ Hollow rod ☐ Driven ☐ Dug
☐ Direct rotary ☐ Air rotary ☐ Bucket auger ☐ ____
☐ Reverse rotary ☐ Jetted ☒ Flight auger

Use
☐ Domestic ☐ Public supply ☐ Industrial ☐ ____
☐ Irrigation ☐ Municipal ☐ Commercial
☐ Test Well ☐ Heating or cooling ☐ Monitoring

Casing Type
☐ Steel ☐ Threaded Height above/below surface ____
☐ Galv ☐ Welded Drive shoe? Yes ___ No ___
☐ PVC ☐ Solvent welded
☐ SS

						Hole diameter
N/A in	to ____ ft	Wgt ____ lb/ft	Sch No ____			____ in to
____ in	to ____ ft	Wgt ____ lb/ft	Sch No ____			____ in to
____ in	to ____ ft	Wgt ____ lb/ft	Sch No ____			____ in to

Intake Portion of Well
Screen type N/A or open hole from ____ ft to ____
Manufacturer ____
Material ____ Dia ____
Fittings ____ Length ____
Set between ____ ft and ____ ft Slot ____
____ ft and ____ ft Slot ____
____ ft and ____ ft Slot ____
Method of installation ____

Filter Pack
Source N/A Gradation ____
Method of installation ____ Composition ____
Volume used ____ Depth to top of fp ____

Grout
Used? ☒ Yes ☐ No Volume used 3.5 ft^3
☐ Neat Cement ☐ Bentonite ☒ cement-bentonite
Method of installation poured
Depth from ____ ft to ____
from ____ ft to ____

Development
Method N/A Duration ____
Dates ____ Sand content after ___ hrs ___
Chemicals used ____

Static Water Level
N/A ft ☐ below ☐ above grade
Date measured ____

Pumping Water Level
N/A ft below above grade Date ____
After ____ hrs pumping at ____

Specific Capacity N/A
____ gpm/ft of drawdown at ____ hrs
Date ____

Pump
Date installed N/A Type ____
Manufacturer ____ Model No ____
HP ____ Volts ____ Capacity ____
Depth of pump intake setting ____ No of stages ____
☐ Oil ☐ Water lubrication Power source ____
Material of drop pipe ____ bowls ____
shafting ____ impellers ____ Bowl dia ____
Column pipe dia ____ Length ____ Modifications ____

Well Head Completion
Pitless adaptor Basement offset Distance above grade ____

Nearest Sources of Possible Contamination
____ ft Direction ____ Type ____
Well disinfected upon completion? Yes No

Geophysical Logs Run

None

Water Quality
Sample taken? Yes ☒ No
Where analyzed ____

Date well completed 11/3/87

WELL CONSTRUCTION LOG. S50-MW-1

WELL LOCATION BUILDING S-50, NAS MEMPHIS

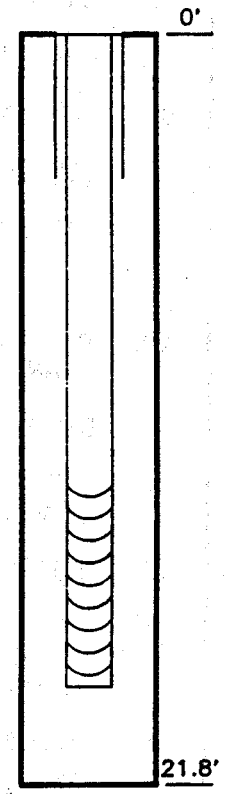
DATE INSTALLED 06/15/93

TYPE OF WELL 2 INCH O.D. SCHEDULE 40 PVC MONITORING WELL

1. HEIGHT OF CASING ABOVE GROUND FLUSH MOUNT
2. WATER SURFACE ELEV. 259.59 (06/28/93)
   a) DEPTH TO SATURATED ZONE N/A
3. TOP OF CASING ELEV. 266.35
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0'
6. SIZE\TYPE OF SCREEN .010" SLOT PVC
7. LENGTH OF SUMP 0
8. TOTAL DEPTH OF BORING 21.8 HOLE DIAMETER
   SCREENED INTERVAL 6.8' - 21.8'
10. TYPE OF SCREEN FILTER PACK 10/20 FILTER SAND
    QUANTITY USED 375lb. SIZE U/C
11. DEPTH TO TOP OF FILTER 5.0'
12. TYPE OF SEAL 1/4" BENTONITE PELLETS
    QUANTITY USED 2.5 GALLONS
13. DEPTH TO TOP OF SEAL 3.0'
14. TYPE OF GROUT PORTLAND TYPE I / BENTONITE
    GROUT MIXTURE 93/7
    METHOD OF PLACEMENT PRESSURE GROUT
15. COMMENTS COMPLETED WITH LOCKING EXPANSION - TYPE CAP

INSTALLATION DESCRIPTION

DESCRIPTION DEPTH(FT.)



ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS

S50-MW-1
WELL CONSTRUCTION LOG

DWG DATE:08/26/93 | DWG NAME: 68MWLOG1

WELL CONSTRUCTION LOG. S50-MW-2

WELL LOCATION BUILDING S-50, NAS MEMPHIS

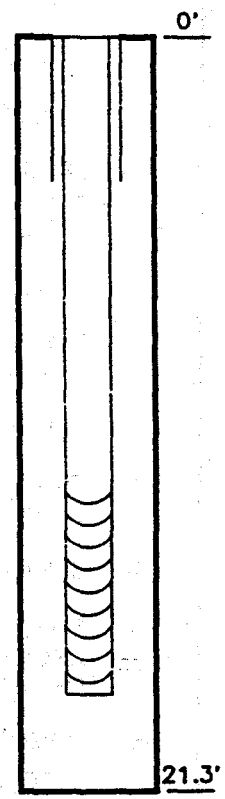
DATE INSTALLED 06/15/93

TYPE OF WELL 2 INCH O.D. SCHEDULE 40 PVC MONITORING WELL

1. HEIGHT OF CASING ABOVE GROUND FLUSH MOUNT
2. WATER SURFACE ELEV. 259.02 (06/28/93)
   a) DEPTH TO SATURATED ZONE N/A
3. TOP OF CASING ELEV. 265.82
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0'
6. SIZE\TYPE OF SCREEN .010" SLOT PVC
7. LENGTH OF SUMP 0
8. TOTAL DEPTH OF BORING 21.3 HOLE DIAMETER
9. SCREENED INTERVAL 16.3' - 21.3'
10. TYPE OF SCREEN FILTER PACK 10/20 FILTER SAND
    QUANTITY USED 375lb. SIZE U/C
11. DEPTH TO TOP OF FILTER 5.0'
12. TYPE OF SEAL 1/4" BENTONITE PELLETS
    QUANTITY USED 2.5 GALLONS
13. DEPTH TO TOP OF SEAL 3.0'
14. TYPE OF GROUT PORTLAND TYPE I / BENTONITE
    GROUT MIXTURE 93/7
    METHOD OF PLACEMENT PRESSURE GROUT
15. COMMENTS COMPLETED WITH LOCKING EXPANSION - TYPE CAP

INSTALLATION DESCRIPTION

DESCRIPTION DEPTH(FT.)



ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS

S50-MW-2
WELL CONSTRUCTION LOG

DWG DATE:08/26/93 | DWG NAME: 68MWLOG2

WELL CONSTRUCTION LOG. S50-MW-3

WELL LOCATION BUILDING S-50, NAS MEMPHIS

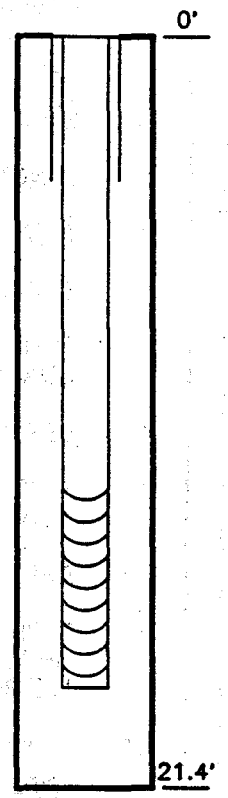
DATE INSTALLED 06/16/93

TYPE OF WELL 2 INCH O.D. SCHEDULE 40 PVC MONITORING WELL

1. HEIGHT OF CASING ABOVE GROUND FLUSH MOUNT
2. WATER SURFACE ELEV. 261.23 (06/28/93)
   a) DEPTH TO SATURATED ZONE N/A
3. TOP OF CASING ELEV. 266.58
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0'
6. SIZE\TYPE OF SCREEN .010" SLOT PVC
7. LENGTH OF SUMP 0
8. TOTAL DEPTH OF BORING 21.4 HOLE DIAMETER
9. SCREENED INTERVAL 6.4' - 21.4'
10. TYPE OF SCREEN FILTER PACK 10/20 FILTER SAND
    QUANTITY USED 375lb. SIZE U/C
11. DEPTH TO TOP OF FILTER 5.0'
12. TYPE OF SEAL 1/4" BENTONITE PELLETS
    QUANTITY USED 2.5 GALLONS
13. DEPTH TO TOP OF SEAL 3.0'
14. TYPE OF GROUT PORTLAND TYPE I / BENTONITE
    GROUT MIXTURE 93/7
    METHOD OF PLACEMENT PRESSURE GROUT
15. COMMENTS COMPLETED WITH LOCKING EXPANSION - TYPE CAP

INSTALLATION DESCRIPTION

DESCRIPTION DEPTH(FT.)



ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS

S50-MW-3
WELL CONSTRUCTION LOG

DWG DATE:08/26/93 | DWG NAME: 6BNMLOG3

WELL CONSTRUCTION LOG. S50-MW-4

WELL LOCATION BUILDING S-50, NAS MEMPHIS

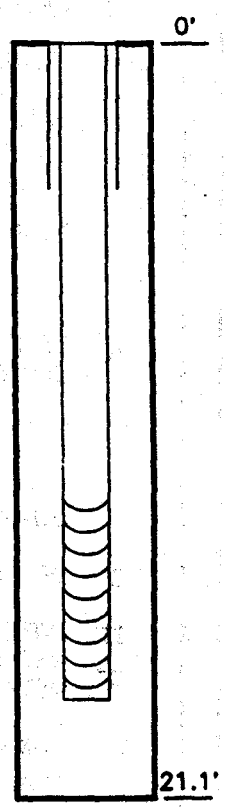
DATE INSTALLED 06/17/93

TYPE OF WELL 2 INCH O.D. SCHEDULE 40 PVC MONITORING WELL

1. HEIGHT OF CASING ABOVE GROUND FLUSH MOUNT
2. WATER SURFACE ELEV. 260.95 (06/28/93)
   a) DEPTH TO SATURATED ZONE N/A
3. TOP OF CASING ELEV. 266.24
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0'
6. SIZE\TYPE OF SCREEN .010" SLOT PVC
7. LENGTH OF SUMP 0
8. TOTAL DEPTH OF BORING 21.1 HOLE DIAMETER _____
   SCREENED INTERVAL 6.1' - 21.1'
10. TYPE OF SCREEN FILTER PACK 10/20 FILTER SAND
    QUANTITY USED 375lb. SIZE _____ U/C _____
11. DEPTH TO TOP OF FILTER 5.0'
12. TYPE OF SEAL 1/4" BENTONITE PELLETS
    QUANTITY USED 2.5 GALLONS
13. DEPTH TO TOP OF SEAL 3.0'
14. TYPE OF GROUT PORTLAND TYPE I / BENTONITE
    GROUT MIXTURE 93/7
    METHOD OF PLACEMENT PRESSURE GROUT
15. COMMENTS COMPLETED WITH LOCKING EXPANSION - TYPE CAP

INSTALLATION DESCRIPTION

DESCRIPTION DEPTH(FT.)



ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS

S50-MW-4
WELL CONSTRUCTION LOG

DWG DATE:08/26/93 | DWG NAME: 68NMLOG4

WELL CONSTRUCTION LOG. S50-MW-5

WELL LOCATION BUILDING S-50, NAS MEMPHIS

DATE INSTALLED 06/18/93

TYPE OF WELL 2 INCH O.D. SCHEDULE 40 PVC MONITORING WELL

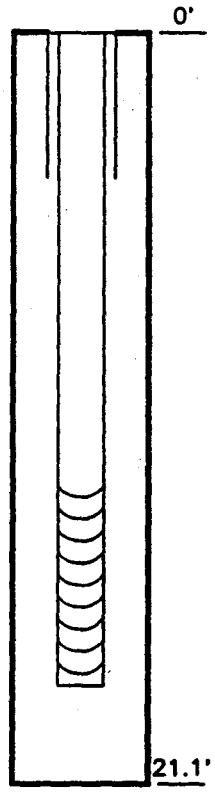
1. HEIGHT OF CASING ABOVE GROUND FLUSH MOUNT
2. WATER SURFACE ELEV. 258.91 (06/28/93)
   a) DEPTH TO SATURATED ZONE N/A
3. TOP OF CASING ELEV. 266.55
4. PROTECTIVE CASING YES (NO)
   a) CASING LENGTH N/A
5. LENGTH OF SCREEN 15.0'
6. SIZE\TYPE OF SCREEN .010" SLOT PVC
7. LENGTH OF SUMP 0
8. TOTAL DEPTH OF BORING 21.1 HOLE DIAMETER _____

   SCREENED INTERVAL 6.1' - 21.1'

10. TYPE OF SCREEN FILTER PACK 10/20 FILTER SAND
    QUANTITY USED 375lb. SIZE _____ U/C _____
11. DEPTH TO TOP OF FILTER 5.0'
12. TYPE OF SEAL 1/4" BENTONITE PELLETS
    QUANTITY USED 2.5 GALLONS
13. DEPTH TO TOP OF SEAL 3.0'
14. TYPE OF GROUT PORTLAND TYPE I / BENTONITE
    GROUT MIXTURE 93/7
    METHOD OF PLACEMENT PRESSURE GROUT
15. COMMENTS COMPLETED WITH LOCKING EXPANSION - TYPE CAP

INSTALLATION DESCRIPTION

DESCRIPTION DEPTH(FT.)



ENVIRONMENTAL ASSESSMENT REPORT
NAS MEMPHIS

S50-MW-5
WELL CONSTRUCTION LOG

DWG DATE:08/26/93 | DWG NAME: 68NMLOG5

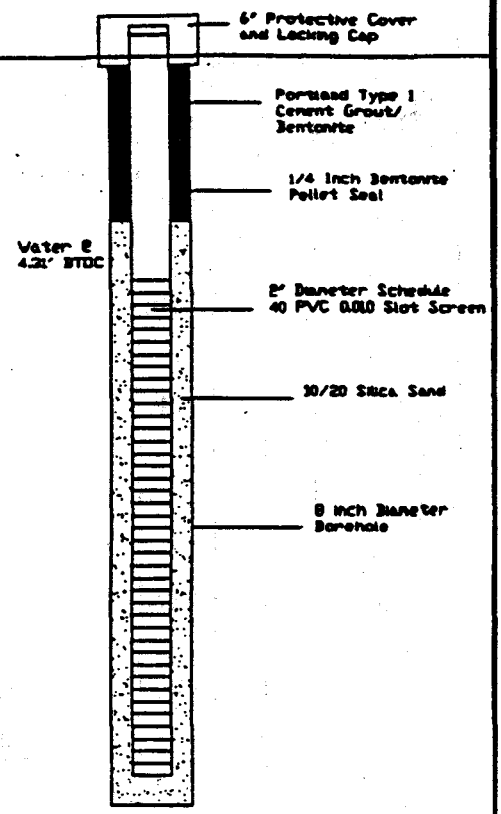
S-376

UST Investigation
EnSafe/Allen & Hoshall

Leak Detection Wells
T1249
T1482

DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	USCS SYMBOL	VAPOR CONCENTRATIONS (ppm)	DESCRIPTION OF SUBSURFACE MATERIALS
1	SS				BDL	3" Asphalt with Granular Base
				OL		Brown Silty Clay (stiff)
2	SS				BDL	
3	SS				BDL	Brown Clayey Silt (moist - medium stiff)
4	SS				BDL	
5	SS			ML	BDL	Spoon Wet @ 9 feet
6	SS				BDL	
7	SS				BDL	
8	SS			CL	BDL	Dark Gray Clay (soft)
						Boring Terminated @ 16 feet
						BDL: Below Detection Limit
						Drilling Method: Hollow Stem Auger Drilling Company: PSI

WELL CONSTRUCTION DETAILS



Environmental and Safety Designs, Inc.

EN SAFE®

5724 SUMMER TREES DR. MEMPHIS, TN. 38134 ☎(901)372-7962

NAS (F.I.D. 0-791673)
Building 376
"D" Street
Millington, Tennessee

B-1/ MW-1

Date Installed: 7/29/92
(S37601LS)

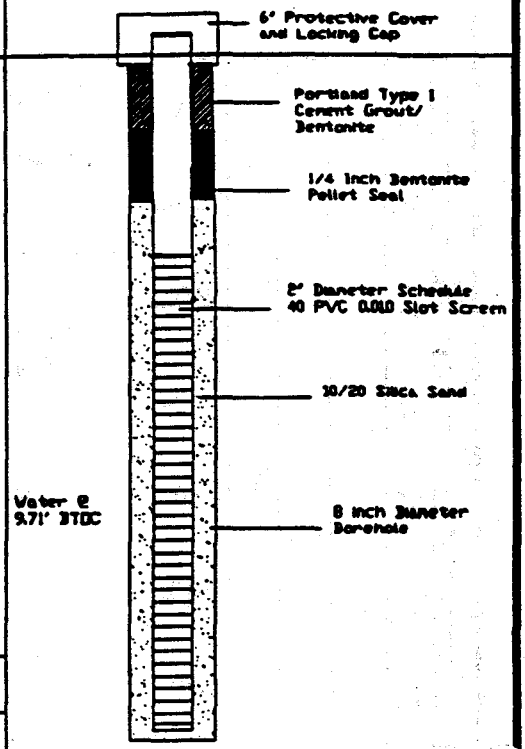
DATE: 08/18/92 | DRW NAME: BJBMW1

DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	USCS SYMBOL	VAPOR CONCENTRATIONS (ppm)	DESCRIPTION OF SUBSURFACE MATERIALS
	SS				BDL	3' Asphalt with Granular Base
	SS			ML	BDL	Brown Clayey Silt (stiff)
5	SS				BDL	
	SS				0.4	
	SS				1.8	Spoon Wet @ 9 feet
10	SS				BDL	
	SS				BDL	Light Brown Clay (medium stiff)
	SS			CL		Dark Gray Clay (soft)
	SS					Boring Terminated @ 14 feet
20						
25						
30						

BDL: Below Detection Limit

Drilling Method: Hollow Stem Auger
Drilling Company: PSI

WELL CONSTRUCTION DETAILS



Environmental and Safety Designs, Inc.

EN SAFE®

5724 SUMMER TREES DR. MEMPHIS, TN. 38134 (901)372-7962

NAS (F.I.D. 0-791673)
Building 376
"D" Street
Millington, Tennessee

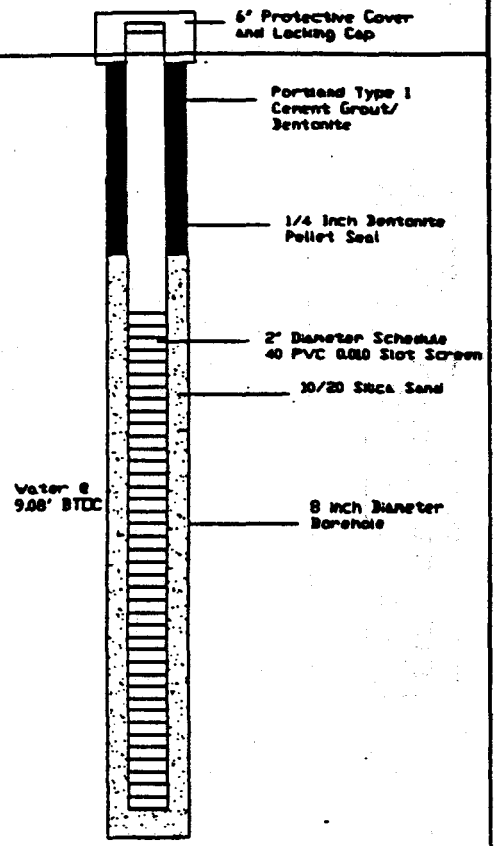
B-2/ MW-2

Date Installed: 7/29/92
(S37602LS)

DATE: 08/18/92 | DRW NAME: BJBMW2

DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	USCS SYMBOL	VAPOR CONCENTRATIONS (ppm)	DESCRIPTION OF SUBSURFACE MATERIALS
1	SS				BDL	3" Asphalt with Granular Base
				OL		Brown Clayey Silt (stiff)
2	SS				BDL	
5 3	SS				BDL	
4	SS				BDL	
5	SS			ML	BDL	Brown Clayey Silt (moist - medium stiff)
10 6	SS				BDL	
7	SS				BDL	Brown Silty Clay (medium stiff)
15 8	SS			CL	BDL	Dark Gray Clay (soft)
						Boring Terminated @ 16 feet
20						
25						
						BDL: Below Detection Limit
30						Drilling Method: Hollow Stem Auger Drilling Company: PSI

WELL CONSTRUCTION DETAILS



Environmental and Safety Designs, Inc.

EN SAFE®

5724 SUMMER TREES DR. MEMPHIS, TN. 38134 (901)372-7962

NAS (F.I.D. 0-791673)
Building 376
"D" Street
Millington, Tennessee

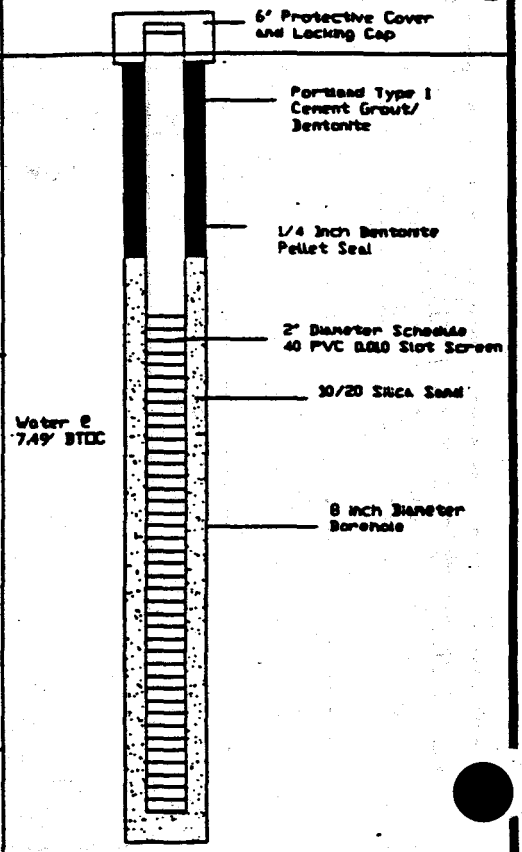
B-3/ MW-3

Date Installed: 7/30/92
(S37603LS)

DATE: 08/18/92 | DRW NAME: BJBMW3

DEPTH (FEET)	SAMPLE TYPE	% RECOVERY	BLOWS/FT.	USCS SYMBOL	VAPOR CONCENTRATIONS (ppm)	DESCRIPTION OF SUBSURFACE MATERIALS
1	SS			OL	1.2	4' Reinforced Concrete w/ Granular Base Brown-Green Clayey Silt (stiff)
2	SS				2.4	
3	SS				1.8	
4	SS				3.2	Green Clayey Silt (soft/diesel odor)
5	SS			ML	1.8	
6	SS				1.4	Brown-Green Clayey Silt (soft/spoon wet)
7	SS				4.8	
8	SS			CL	1.2	Dark Gray Clay (soft)
9	SS				0.4	
10						
20						Boring Terminated @ 18 feet
25						BDL: Below Detection Limit
30						Drilling Method: Hollow Stem Auger Drilling Company: PSI

WELL CONSTRUCTION DETAILS



Environmental and Safety Designs, Inc.

EN SAFE®

5724 SUMMER TREES DR. MEMPHIS, TN. 38134 ☎(901)372-7962

NAS (F.I.D. 0-791673)
Building 376
"D" Street
Millington, Tennessee

B-4/ MW-4

Date Installed: 7/30/92
(S37604LS)

DATE: 08/18/92

DRW NAME: BJBMW4

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

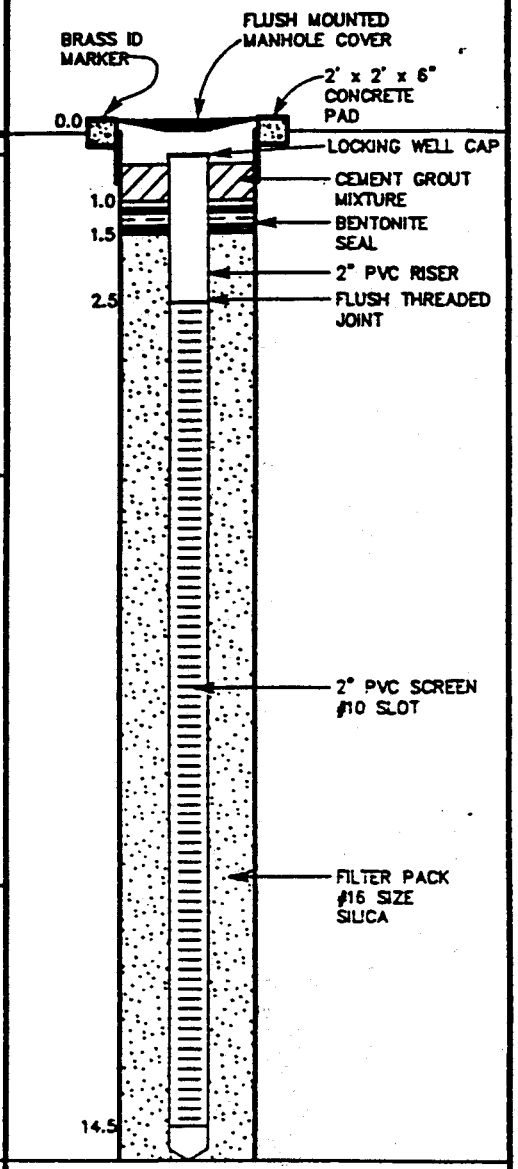
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEMS 1249 AND 1482, NAS, MEMPHIS

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1249-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			.3 ASPHALT
			SILT, CLAYEY, LIGHT GREEN
5			5.0
			SILT, CLAYEY, BROWN, MOIST
10			11.0
			SILT, CLAYEY, BROWN, WET
			14.2 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 6, 1990
Well Completion Date: JAN. 6, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.2'

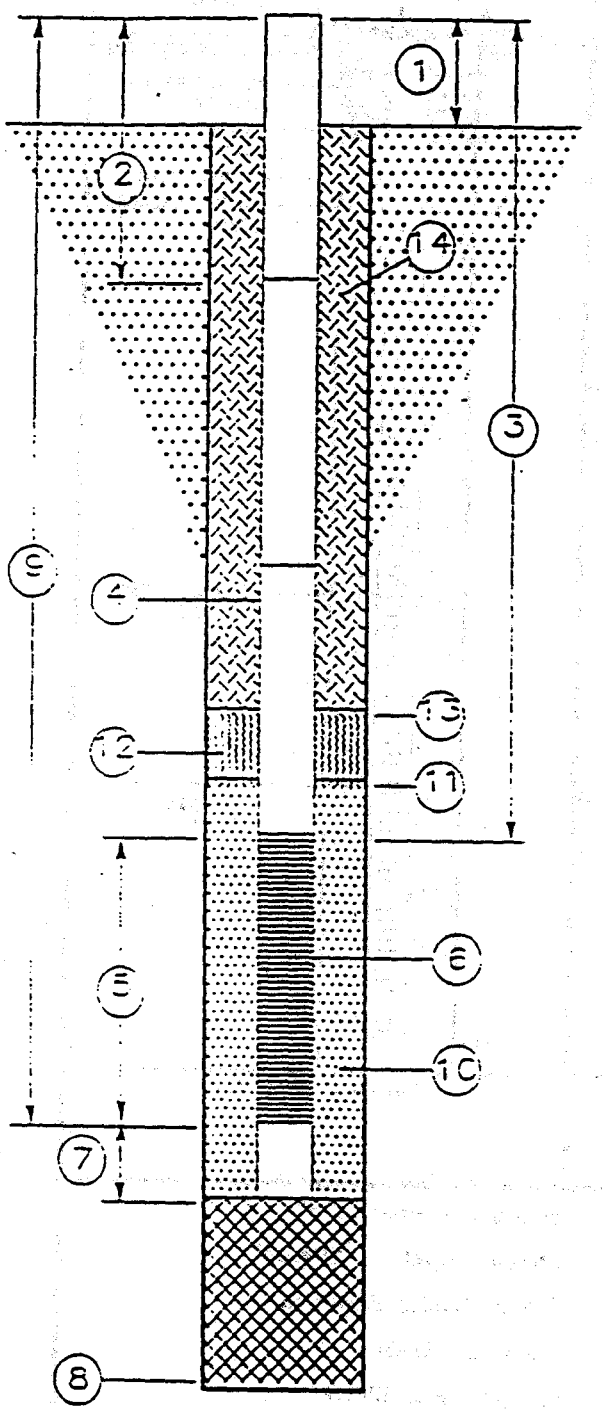
Boring Diameter: 6.75"
Ground Elevation: 264.04'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-1249-1

DATE OF INSTALLATION 1-6-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 $ft.^3$ Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 $ft.^3$
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

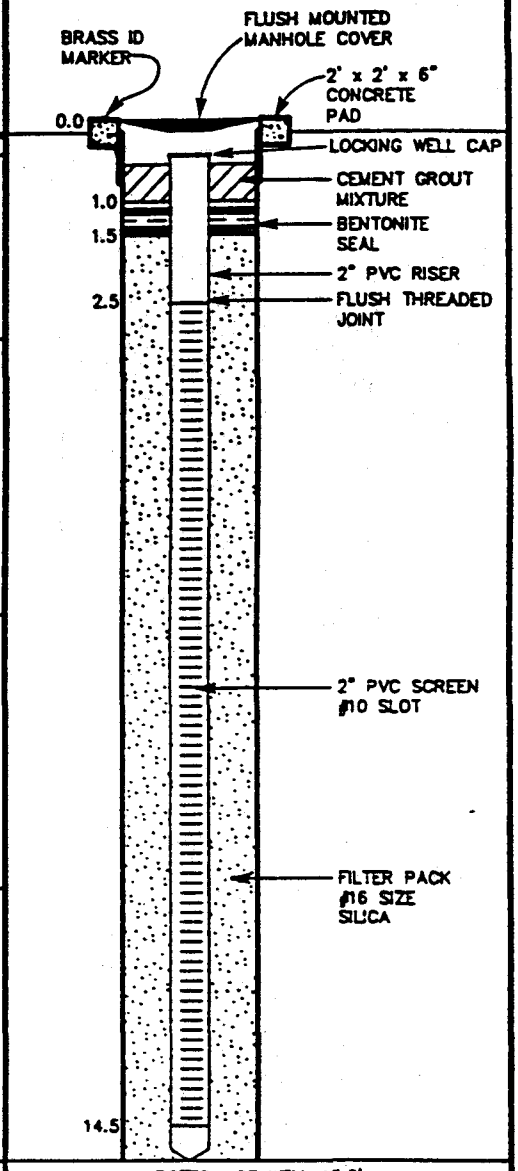
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1249 AND 1482, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1249-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			.3 ASPHALT
			SILT, BROWN
			3.0
5			SILT, CLAYEY, GRAY SLIGHT HYDROCARBON ODOR
			7.0
			SILT, CLAYEY, GREEN
10			11.0
			SILT, CLAYEY, BROWN, WET
			14.0 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 6, 1990
Well Completion Date: JAN. 6, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.0'

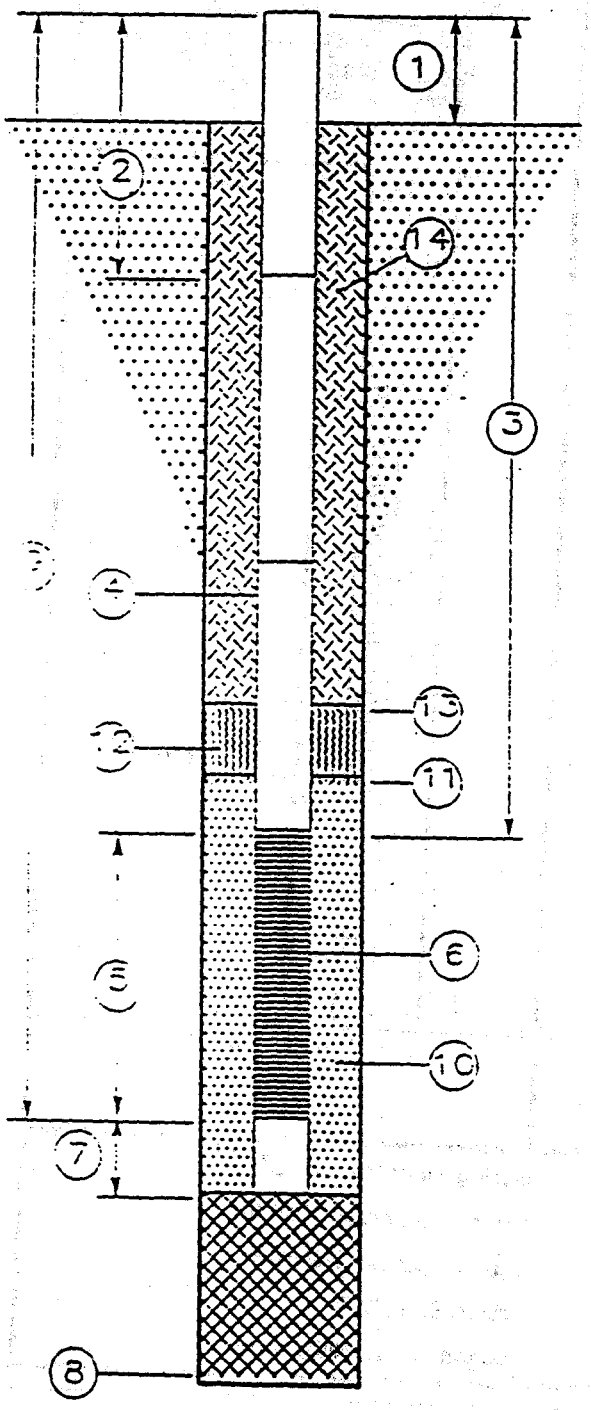
Boring Diameter: 6.75"
Ground Elevation: 264.06'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-1249-2

DATE OF INSTALLATION 1-6-90



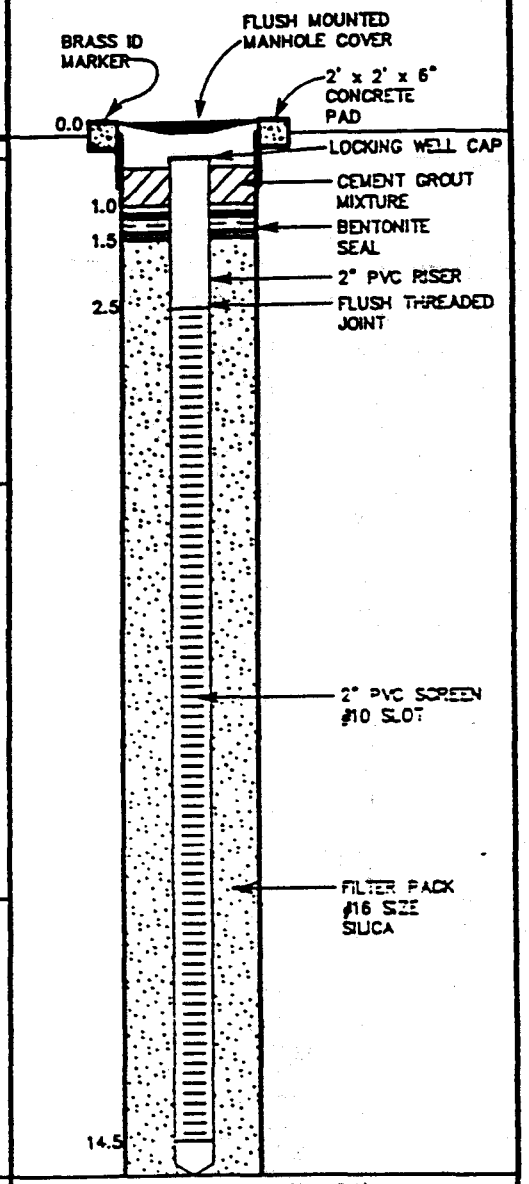
1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

GROUNDWATER MONITORING WELL INSTALLATION

LOCATION TANK SYSTEMS 1249 AND 1482, NAS, MEMPHIS

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1482-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
			.3 ASPHALT	
			SILT, CLAYEY, LIGHT GREEN	
5			5.0	
			SILT, CLAYEY, BROWN, MOIST	
10			11.0	
			SILT, CLAYEY, BROWN, WET	
			14.2 24 HOUR WATER LEVEL	
15			15.0	
			TERMINATED @ 15.0	BOTTOM OF WELL 15.0'



Boring Completion Date: JAN. 6, 1990 | Boring Diameter: 6.75"

Well Completion Date: JAN. 6, 1990 | Ground Elevation: 264.04'

Well Development Date: N.A. | Top of Casing Elevation:

Drilling Method: POWER AUGER | Driller: B. ELDER

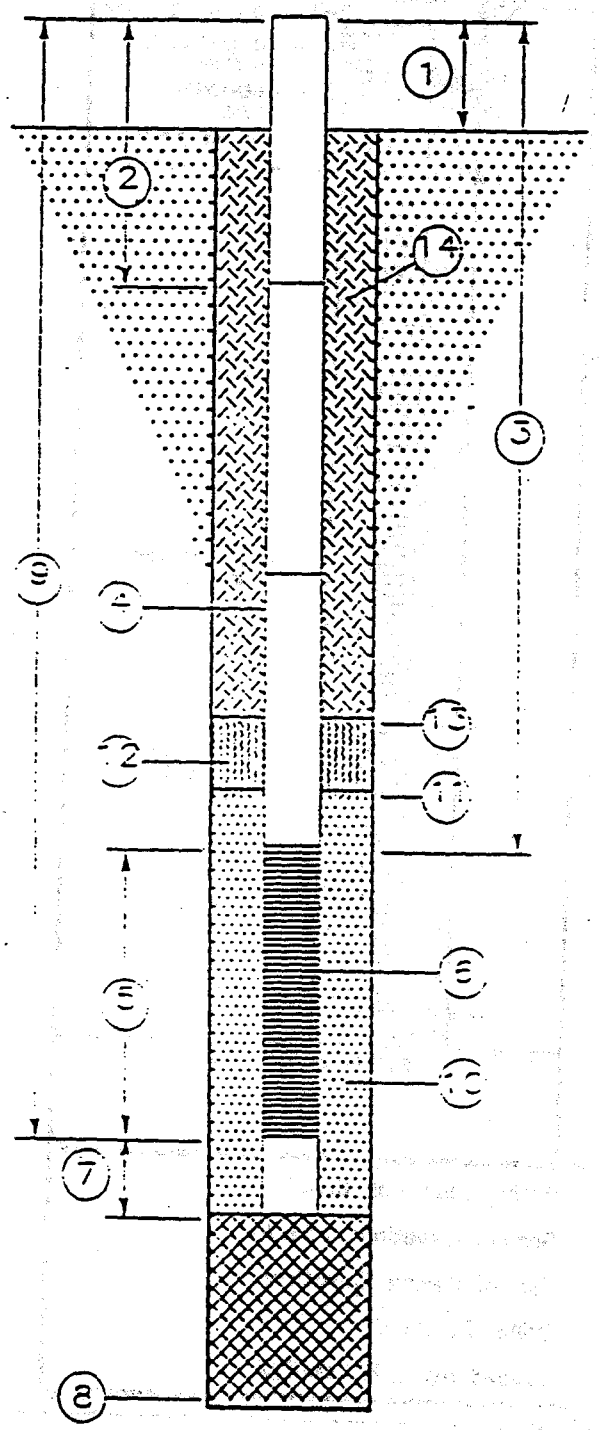
Depth to Water: 14.2' | Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM 1482-1

DATE OF INSTALLATION 1-6-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC [illegible]" slot
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

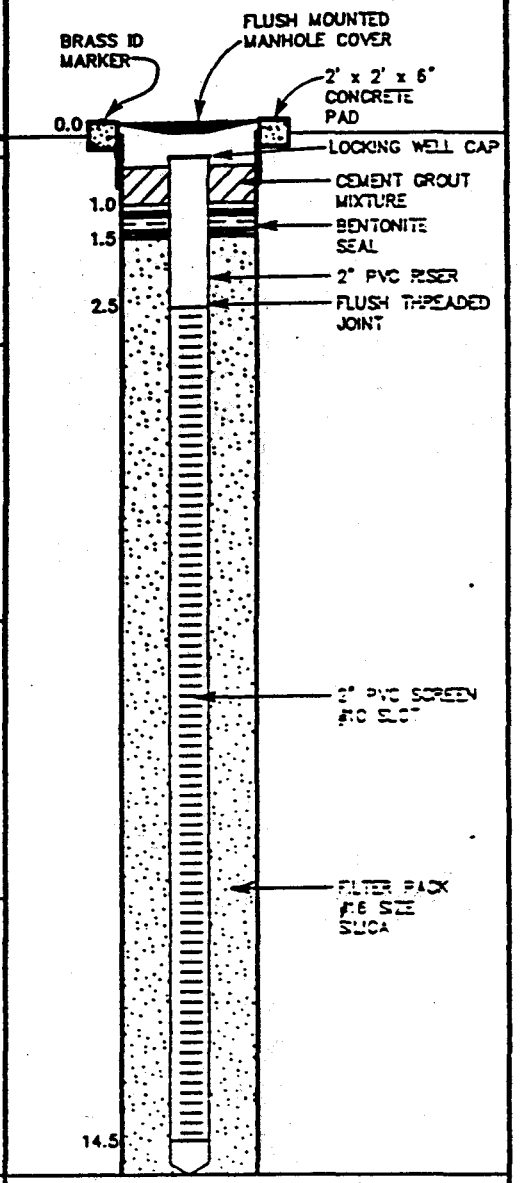
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1249 AND 1482, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1482-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			.3 ASPHALT
			SILT, BROWN
			3.0
5			SILT, CLAYEY, GRAY SLIGHT HYDROCARBON ODOR
			7.0
			SILT, CLAYEY, GREEN
10			11.0
			SILT, CLAYEY, BROWN, WET
			14.0 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 6, 1990
Well Completion Date: JAN. 6, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.0'

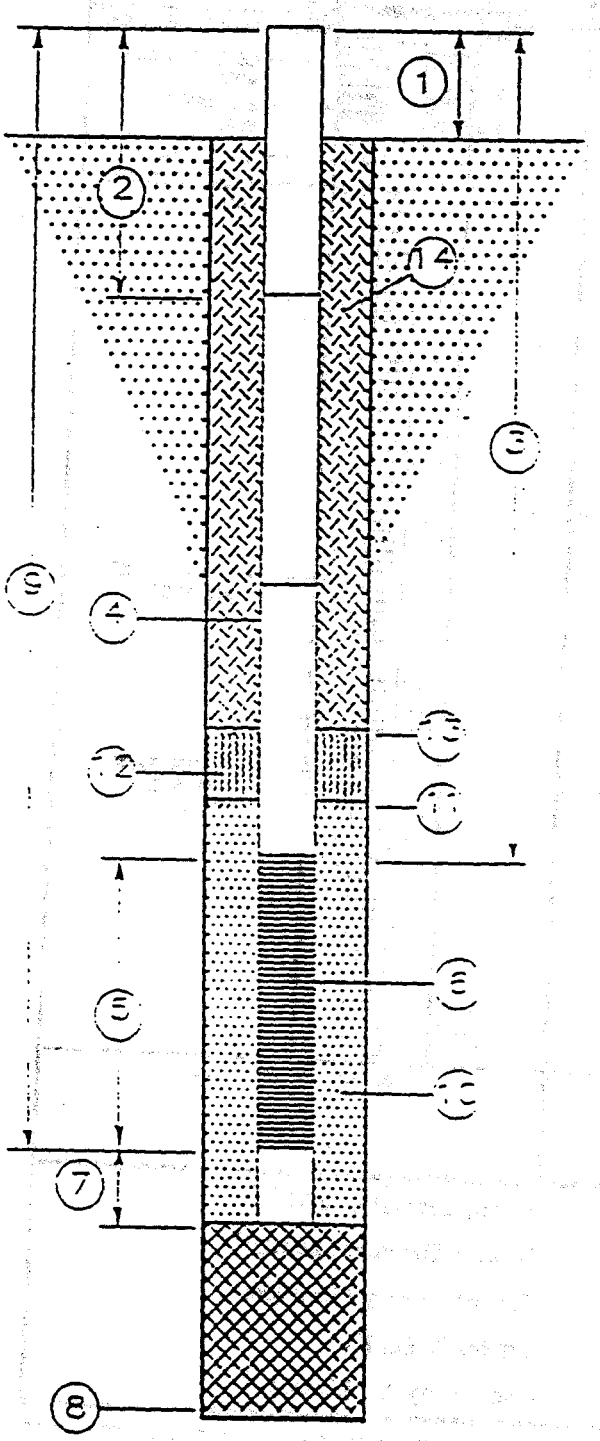
Boring Diameter: 6.75"
Ground Elevation: 264.06'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM 1482-2

DATE OF INSTALLATION 1-6-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft.
   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #00
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

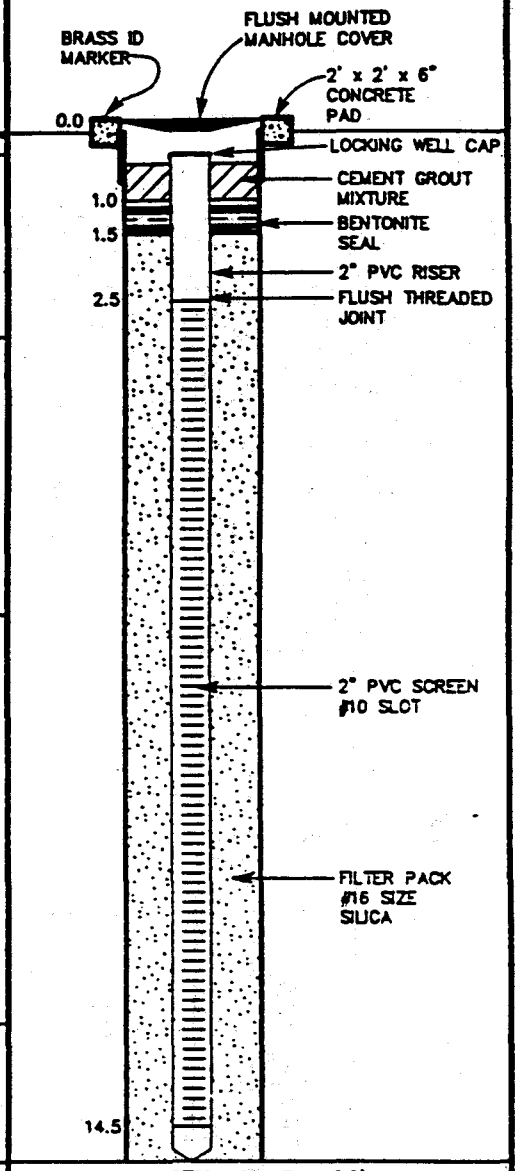
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1249 AND 1482, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T1482-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			.3 ASPHALT
			SILT, LIGHT BROWN STRONG HYDROCARBON ODOR
			3.0
5			SILT, CLAYEY, GRAY, MOIST
			7.0
10			SILT, CLAYEY, GREEN, MOIST
			11.0
			13.6 24 HOUR WATER LEVEL
			SILT, CLAYEY, BROWN, WET
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 6, 1990
Well Completion Date: JAN. 6, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 13.6'

Boring Diameter: 8.00"
Ground Elevation: 263.75'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

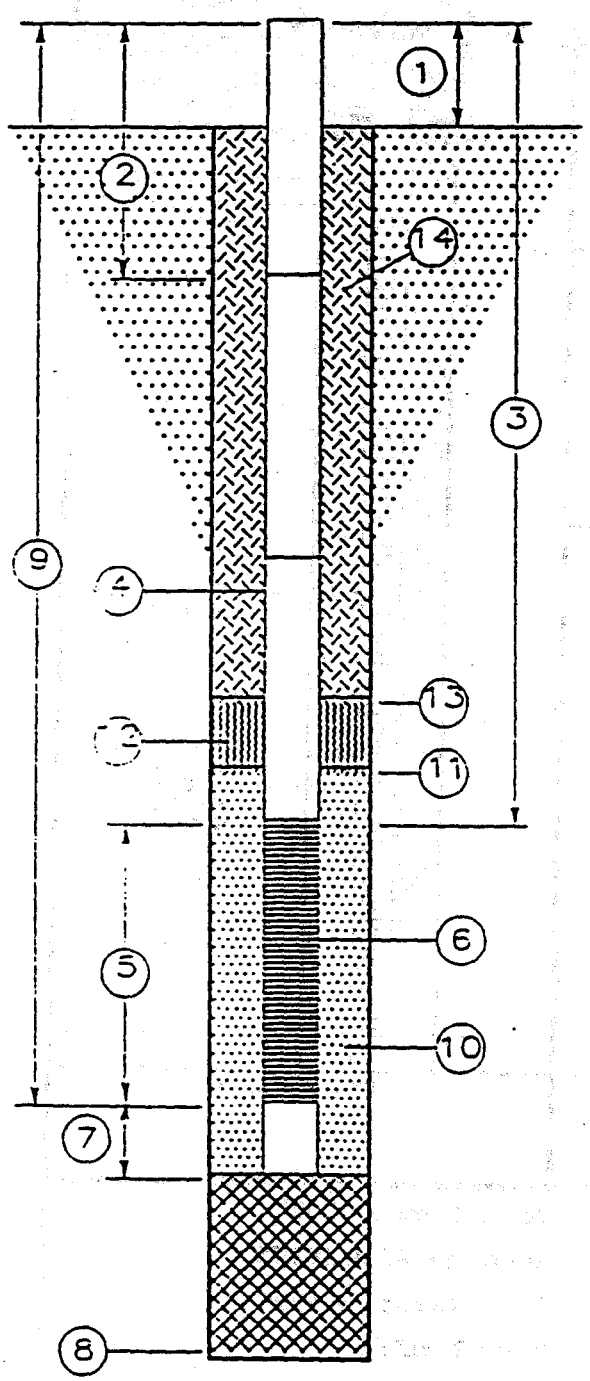
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1482-3

DATE OF INSTALLATION 1-6-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

S-237

UST Investigaion
Memphis Environmental Center

CASING ELEVATION: 101.78

DATUM: SE Corner of Building

WELL LOCATION: MW-1 (S23701LS)

DATE & TIME BEGAN: 09/23/92; 10:50am

DESCRIPTION OF WEATHER: Sunny 75°F

DRILLING TECHNIQUE:

Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
09/26/92	92.81
10/15/92	92.09

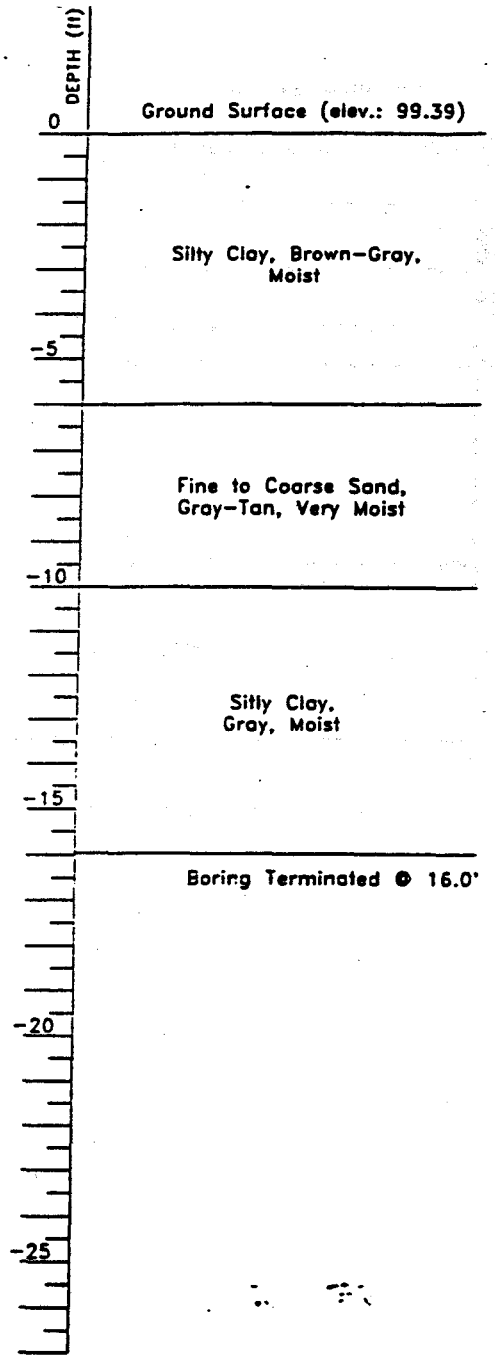
DRILLER: L. Smith

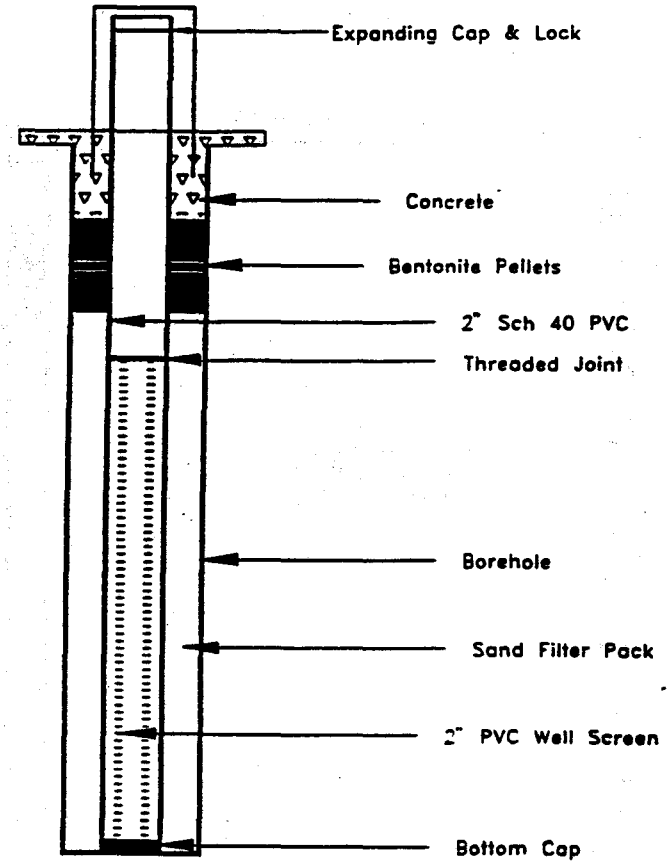
INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 15.0

DATE & TIME: 09/23/92 1:00pm





MEMPHIS ENVIRONMENTAL CENTER, INC.

2803 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO.	NAVALMW1
DRAWN:	DKD
DATE:	NOVEMBER 19, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION
BUILDING S-237
FACILITY ID NO.: 9-791685
MILLINGTON, TENNESSEE

CASING ELEVATION: 96.39

DATUM: SE Corner of Building

WELL LOCATION:

MW-2

(S23702LS)

DATE & TIME BEGAN: 09/22/92; 1:20pm

DESCRIPTION OF WEATHER: Light Rain 75°F

DRILLER: L. Smith

INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 15.0

DATE & TIME: 09/22/92 1:50pm

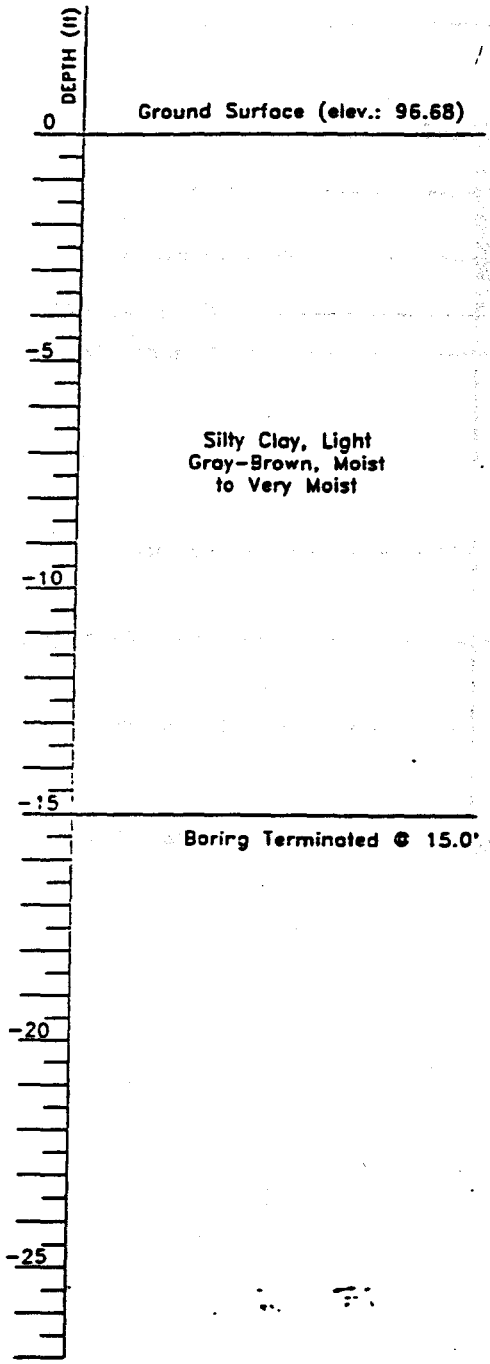
DRILLING TECHNIQUE:

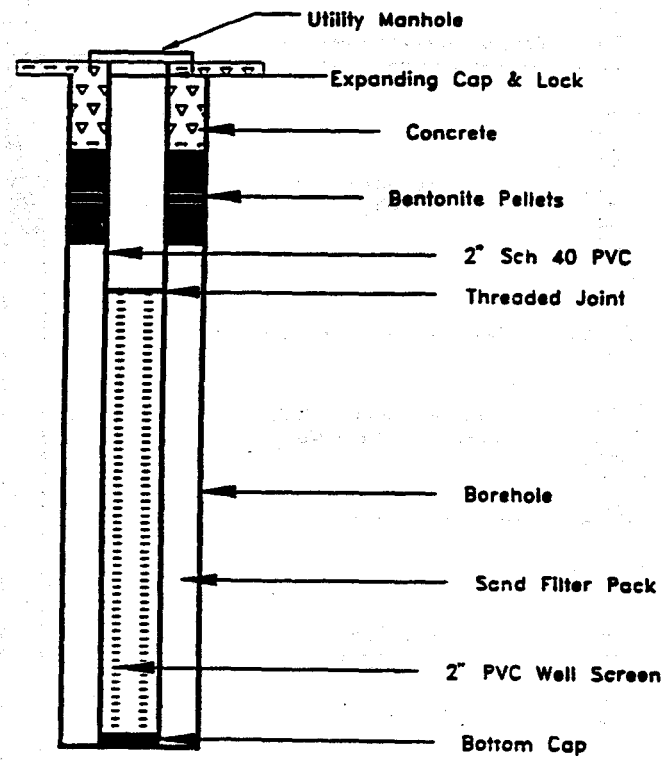
Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
09/26/92	92.68
10/15/92	91.92





MEMPHIS ENVIRONMENTAL CENTER, INC.

2003 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO. NAVALMW2
DRAWN: DKD
DATE: NOVEMBER 2, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION
BUILDING S-237
FACILITY ID NO.: 9-791685
MILLINGTON, TENNESSEE

CASING ELEVATION: 96.40

DATUM: SE Corner of Building

WELL LOCATION:

MW-3

(S23703LS)

DATE & TIME BEGAN: 09/22/92; 11:00am

DESCRIPTION OF WEATHER: Heavy Rain 70°F

DRILLING TECHNIQUE:

Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
09/26/92	92.75
10/15/92	92.14

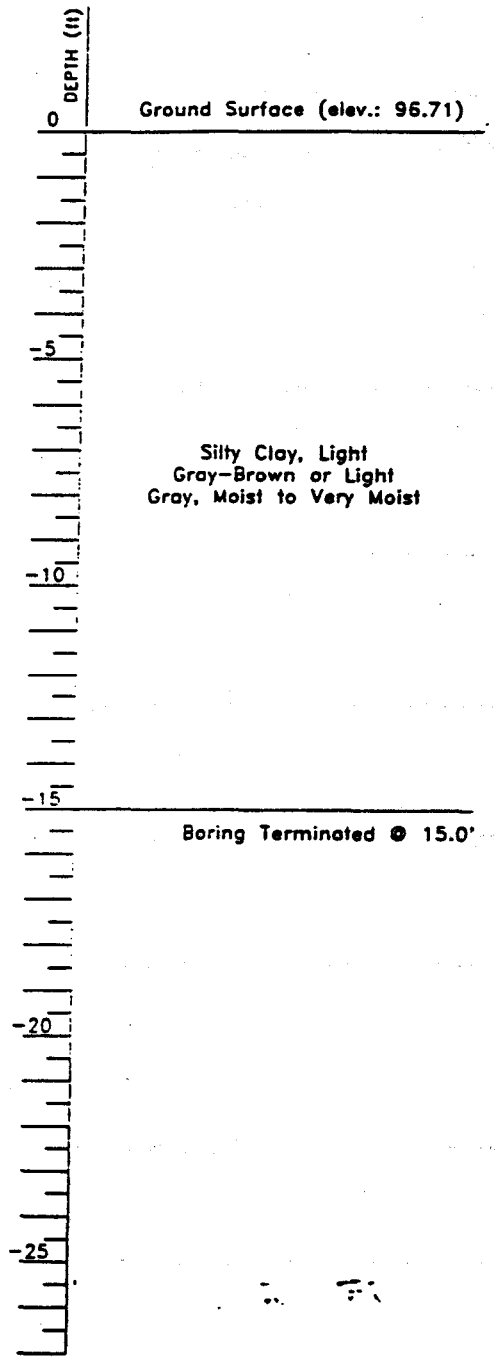
DRILLER: L. Smith

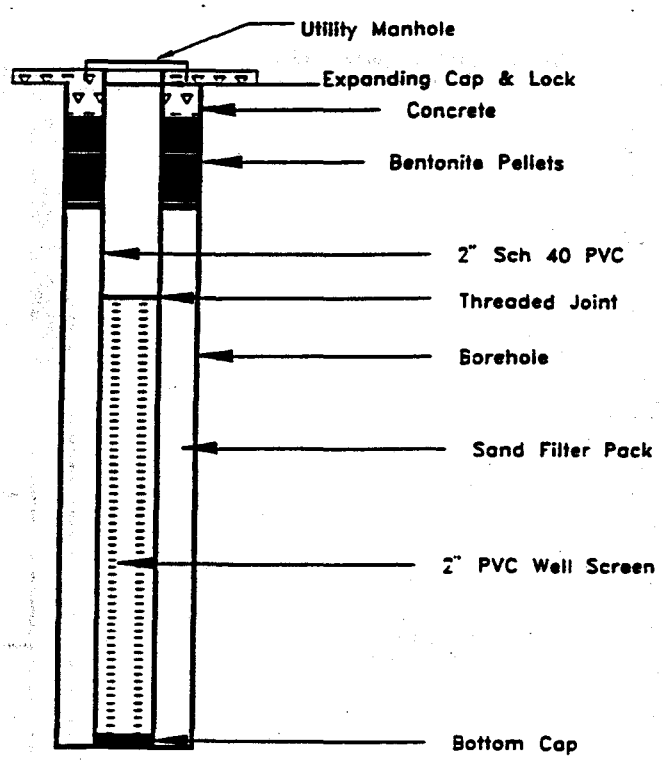
INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 15.0

DATE & TIME: 09/22/92 1:00pm





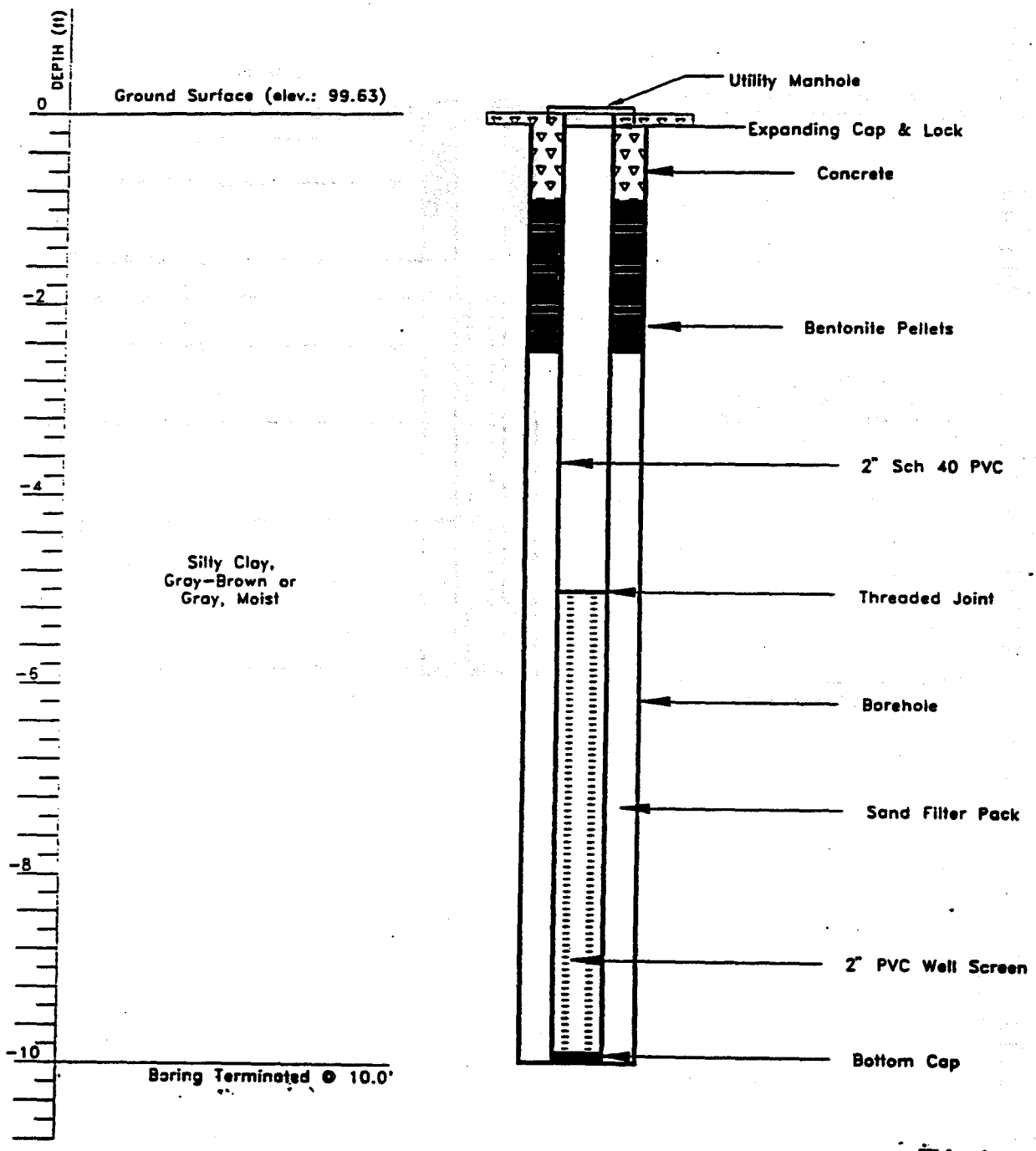
MEMPHIS ENVIRONMENTAL CENTER, INC.

2803 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO. NAVALMW3
DRAWN: DKD
DATE: NOVEMBER 2, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION
BUILDING S-237
FACILITY ID NO.: 9-791685
MILLINGTON, TENNESSEE

CASING ELEVATION: 99.41 DATUM: SE Corner of Building	WELL LOCATION: MW-4 (S23704LS)	DATE & TIME BEGAN: 09/23/92; 5:00pm DESCRIPTION OF WEATHER: Sunny 75°F
DRILLING TECHNIQUE: Stainless Steel Hand Auger	GROUND WATER ELEVATIONS DATE / ELEVATION 09/26/92 — 93.48 10/15/92 — 92.34	DRILLER: J. Johnston INSPECTOR: M. Roberts BORING TERMINATED AT: DEPTH (ft): 10.0 DATE & TIME: 09/24/92 10:00cm



MEMPHIS ENVIRONMENTAL CENTER, INC.

DWG. NO. NAVALMW4
DRAWN: DKD
DATE: NOVEMBER 2, 1992

2603 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION
BUILDING S-237
FACILITY ID NO.: 9-791685
MILLINGTON, TENNESSEE

CASING ELEVATION: 101.28

DATUM: SE Corner of Building

WELL LOCATION:

MW-5

(S23705LS)

DATE & TIME BEGAN: 10/13/92; 10:00am

DESCRIPTION OF WEATHER: Sunny 75°F

DRILLER: J. Holcomb

INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 15.0

DATE & TIME: 10/13/92 11:00am

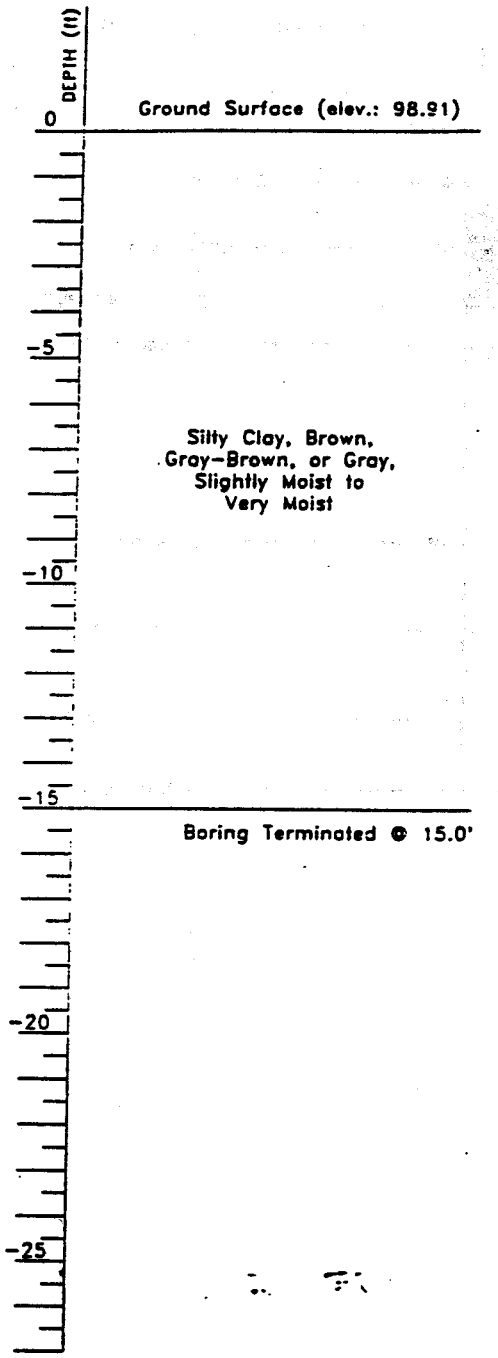
DRILLING TECHNIQUE:

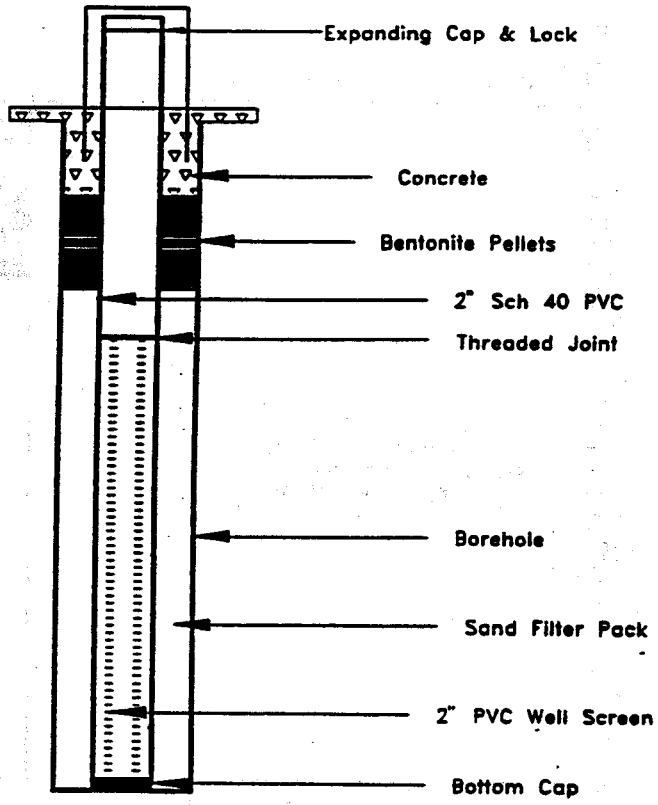
Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
10/15/92	92.25





MEMPHIS ENVIRONMENTAL CENTER, INC.

2803 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO. NAVALMW5
DRAWN: DKD
DATE: NOVEMBER 19, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION
BUILDING S-237
FACILITY ID NO.: 9-791685
MILLINGTON, TENNESSEE

CASING ELEVATION: 102.10

DATUM: SE Corner of Building

WELL LOCATION:

MW-6

(S23706LS)

DATE & TIME BEGAN: 10/13/92; 12:00pm

DESCRIPTION OF WEATHER: Sunny 75°F

DRILLER: J. Holcomb

INSPECTOR: M. Roberts

BORING TERMINATED AT:

DEPTH (ft): 15.0

DATE & TIME: 10/13/92 12:45pm

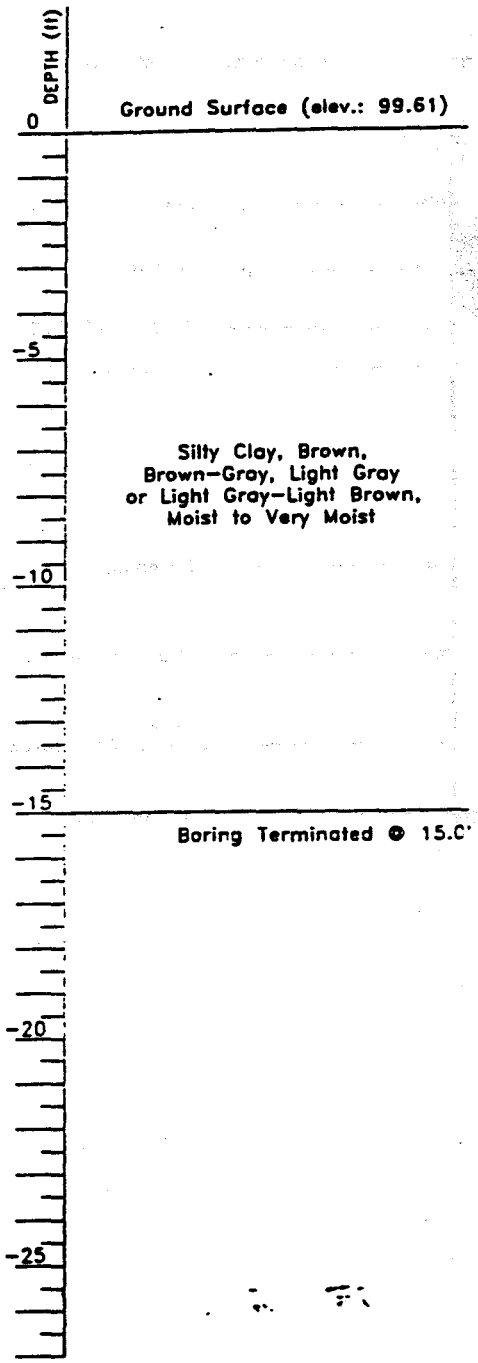
DRILLING TECHNIQUE:

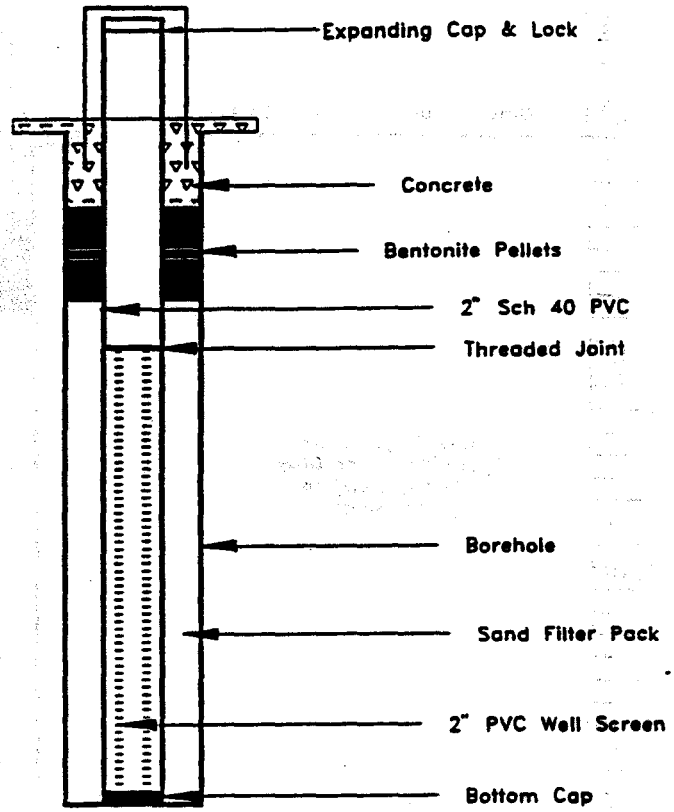
Hollow Stem Auger

Split-Spoon Sampler

GROUND WATER ELEVATIONS

DATE	ELEVATION
10/15/92	91.85





MEMPHIS ENVIRONMENTAL CENTER, INC.

2603 Corporate Avenue, Suite 100
Memphis, Tennessee 38132

DWG. NO. NAVALMW6
DRAWN: DKD
DATE: NOVEMBER 19, 1992

MONITORING WELL CONSTRUCTION DIAGRAM
NAVAL AIR STATION
BUILDING S-237
FACILITY ID NO.: 9-791685
MILLINGTON, TENNESSEE

Remaining Leak Detection Wells

T337 & T336 (JP-5 Fuel Farm)
T1637

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

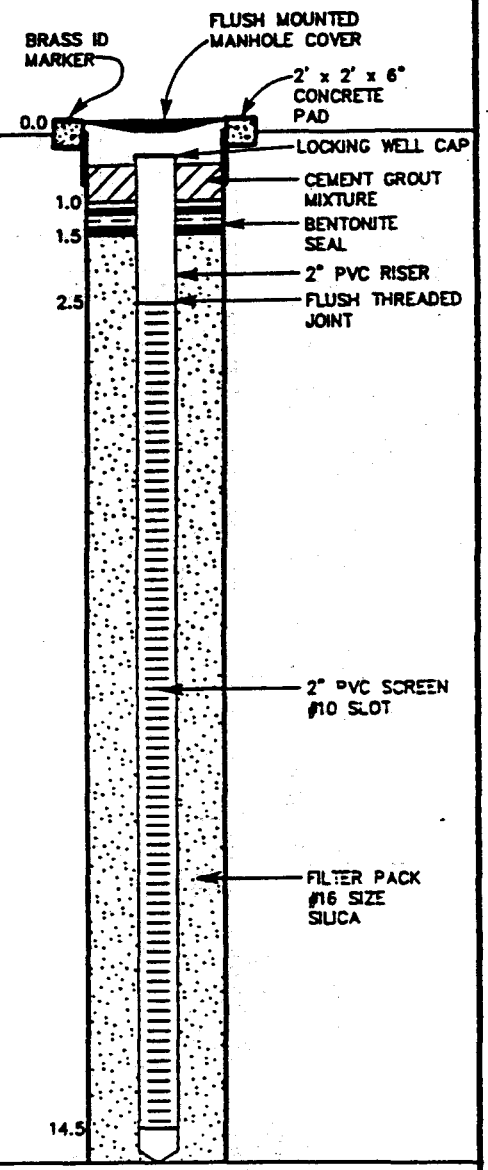
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 336, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T336-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, LIGHT BROWN
			4.5
5			SILT, CLAYEY, GRAY
			7.0
10			SILT, CLAYEY, BROWN, MOIST
			14.1 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 3, 1990
Well Completion Date: JAN. 3, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.1'

Boring Diameter: 6.75"
Ground Elevation: 271.37'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

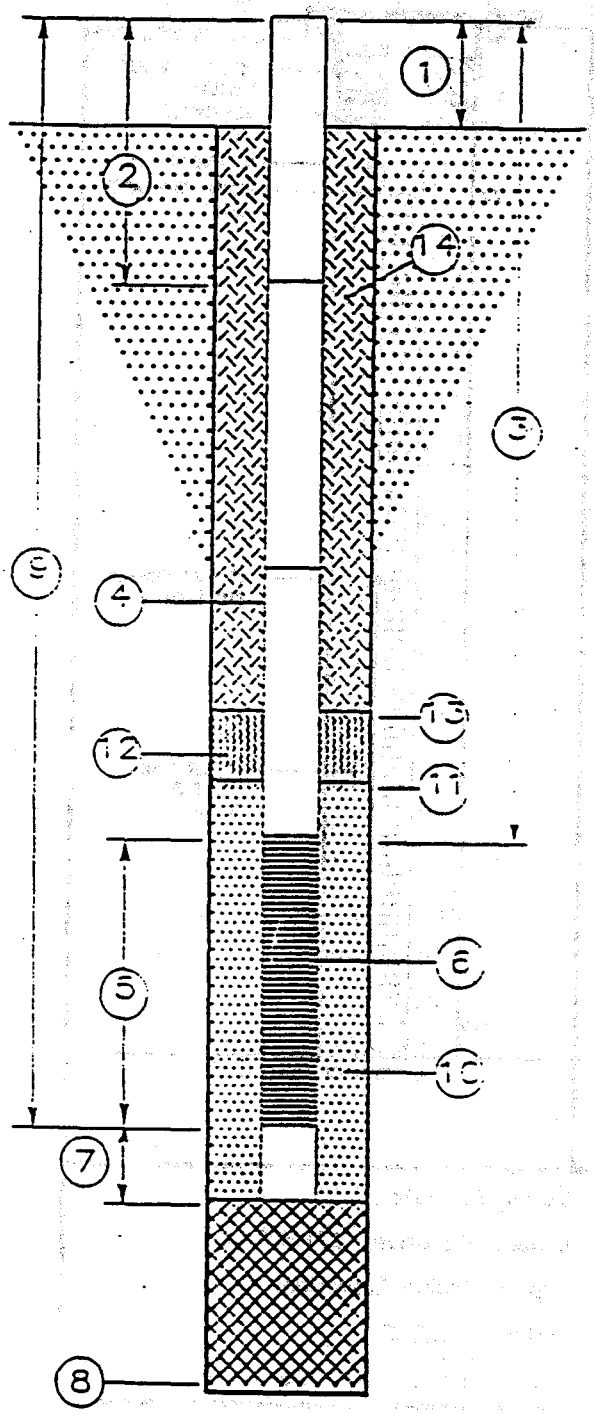
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T336-1

DATE OF INSTALLATION 1-3-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/O
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

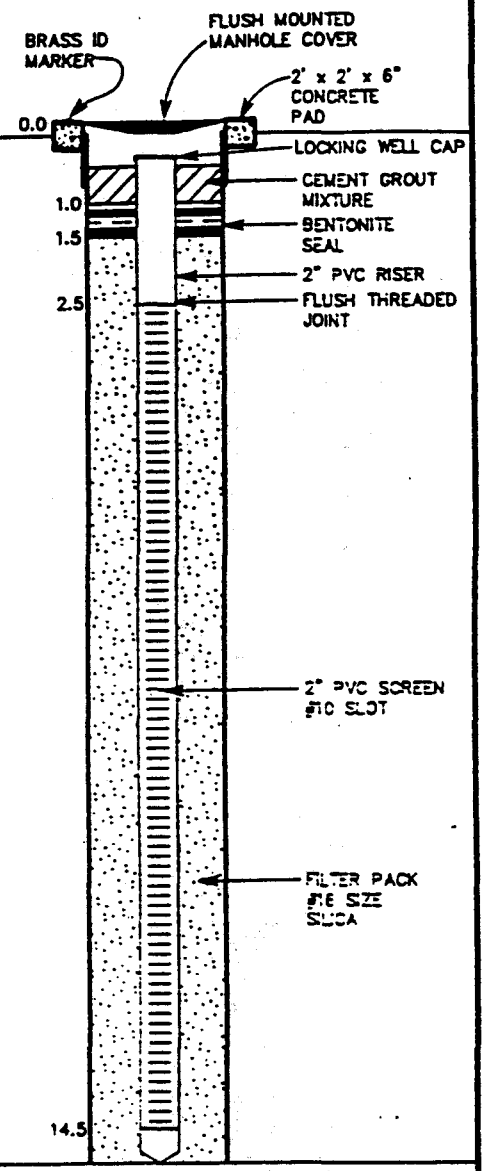
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 336, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T336-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
5			SILT, CLAYEY, BROWN
			6.0
10			SILT, CLAYEY, GRAY, MOIST
			14.5' 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 3, 1990
Well Completion Date: JAN. 3, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.5'

Boring Diameter: 6.75"
Ground Elevation: 270.86'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

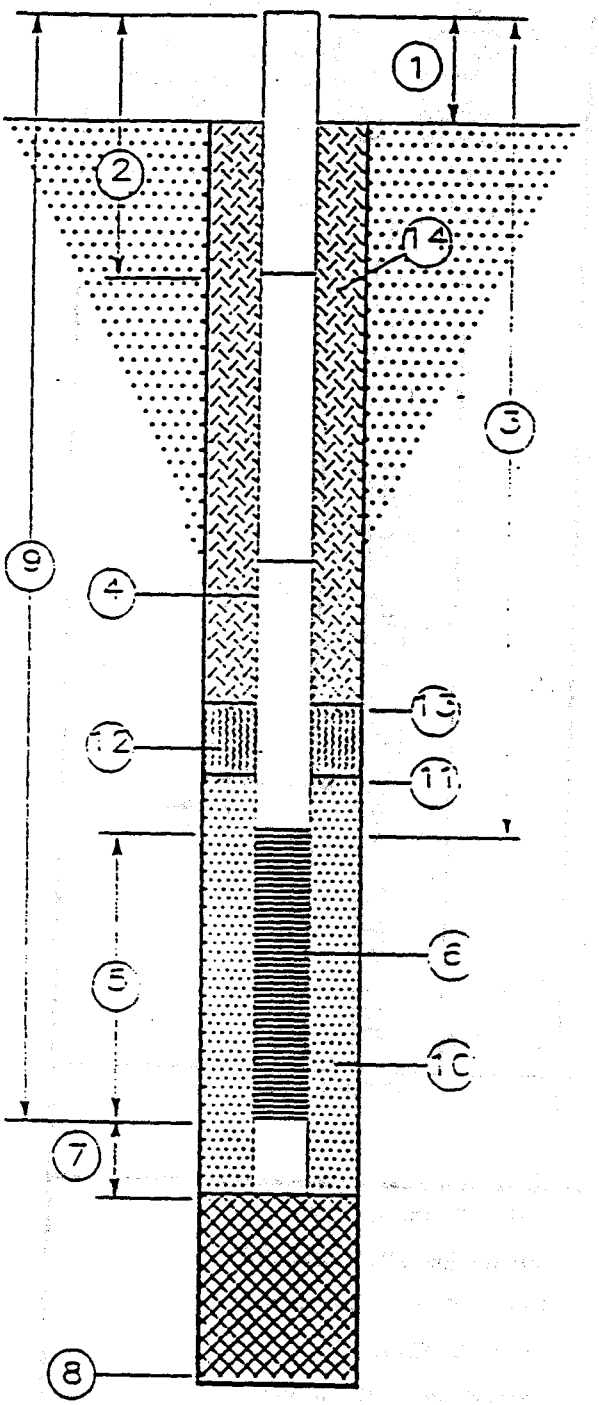
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T336-2

DATE OF INSTALLATION 1-3-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

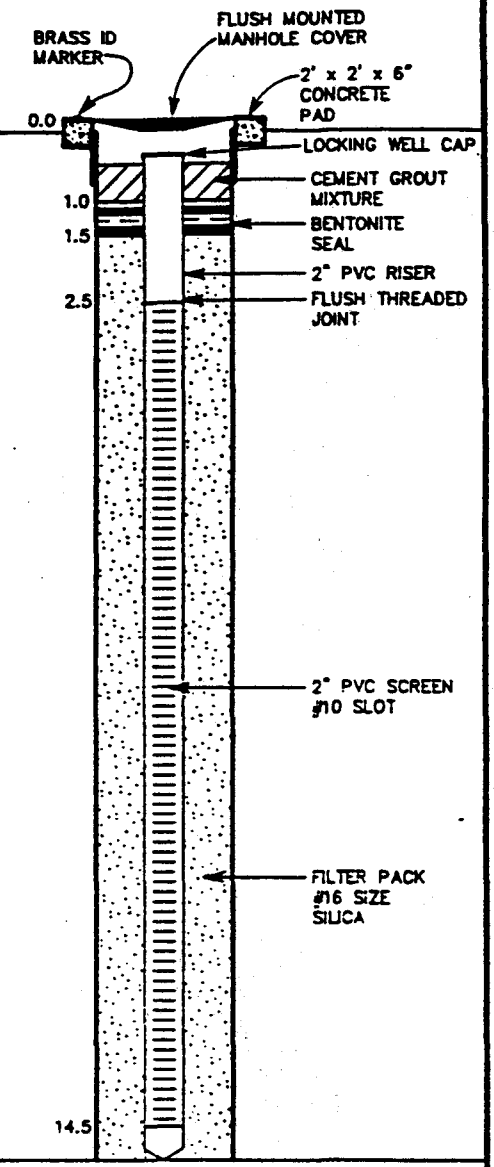
    Method of Placement Pour

GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 336, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T336-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION	WELL CONSTRUCTION
5			SILT, CLAYEY, BROWN (5.5)	
10			SILT, CLAYEY, GRAY (11.0)	
15			SILT, CLAYEY, GRAY, MOIST; 14.5' 24 HOUR WATER LEVEL; 15.0 TERMINATED @ 15.0	



Boring Completion Date: JAN. 3, 1990
Well Completion Date: JAN. 3, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.5'

Boring Diameter: 6.75"
Ground Elevation: 271.17'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

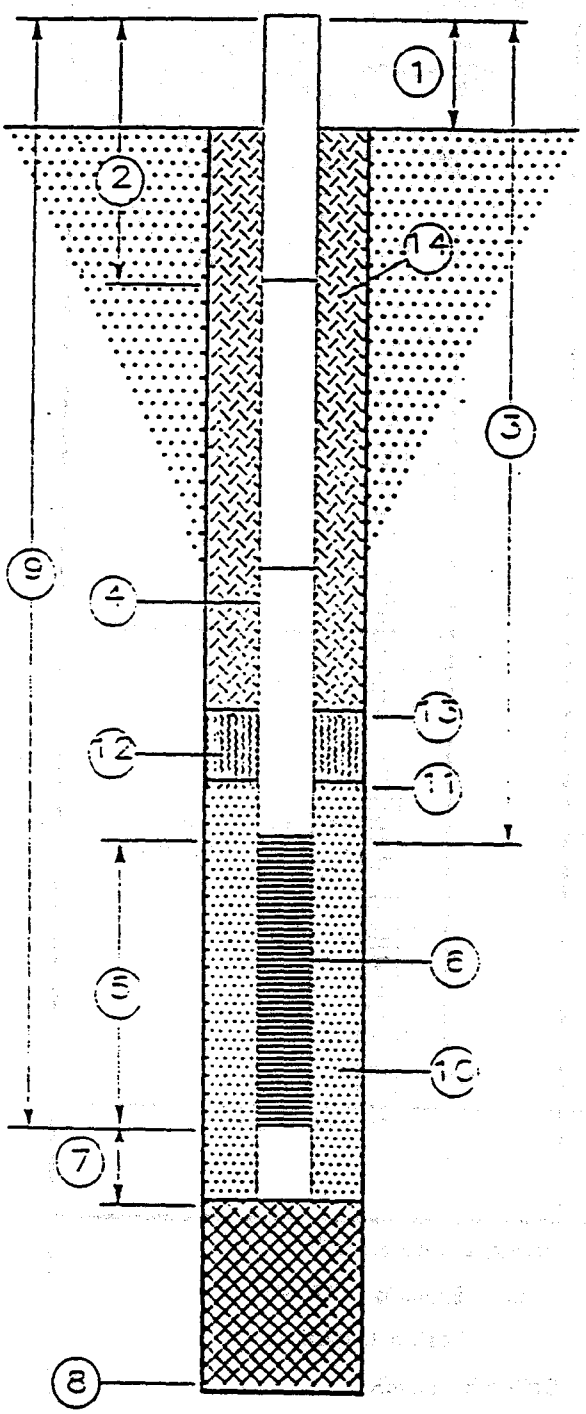
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T336-3

DATE OF INSTALLATION 1-3-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COM

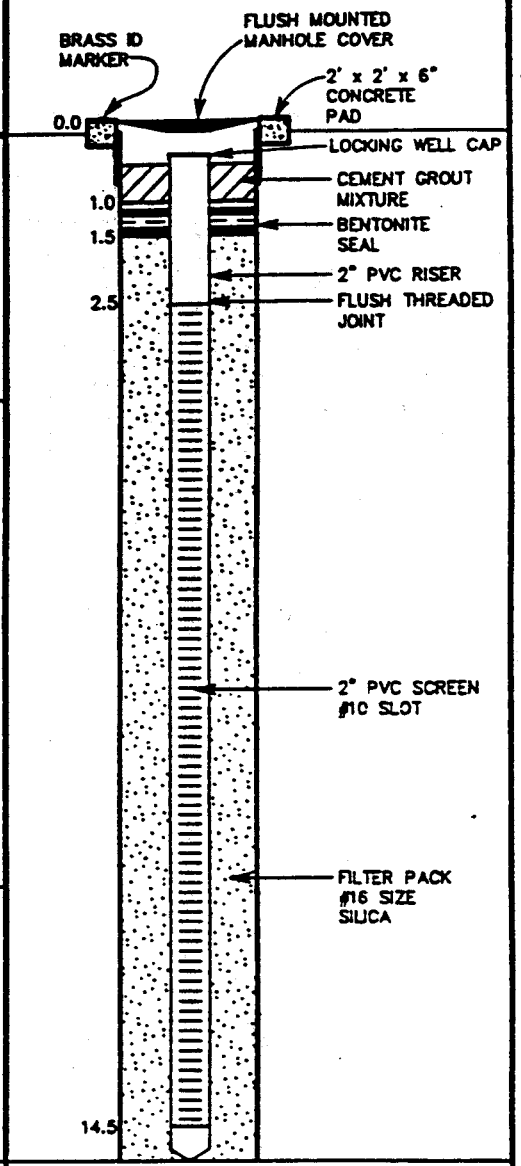
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 337, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T337-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, GRAY (0.0 – 4.0)
5			SILT, CLAYEY, GRAY (4.0 – 11.0)
10			SILT, CLAYEY, GRAY (11.0 – 14.5)
15			14.5 24 HOUR WATER LEVEL; 15.0 TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 3, 1990
Well Completion Date: JAN. 3, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.5'

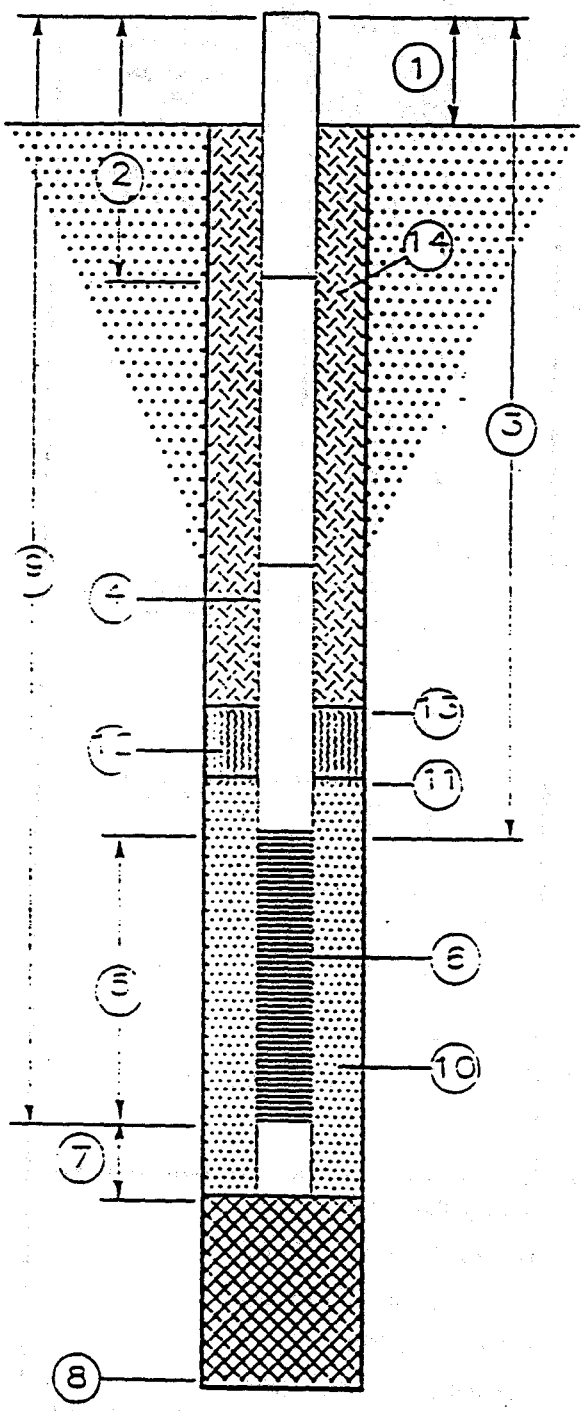
Boring Diameter: 6.75"
Ground Elevation: 271.01'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T337-1

DATE OF INSTALLATION 1-3-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inc
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

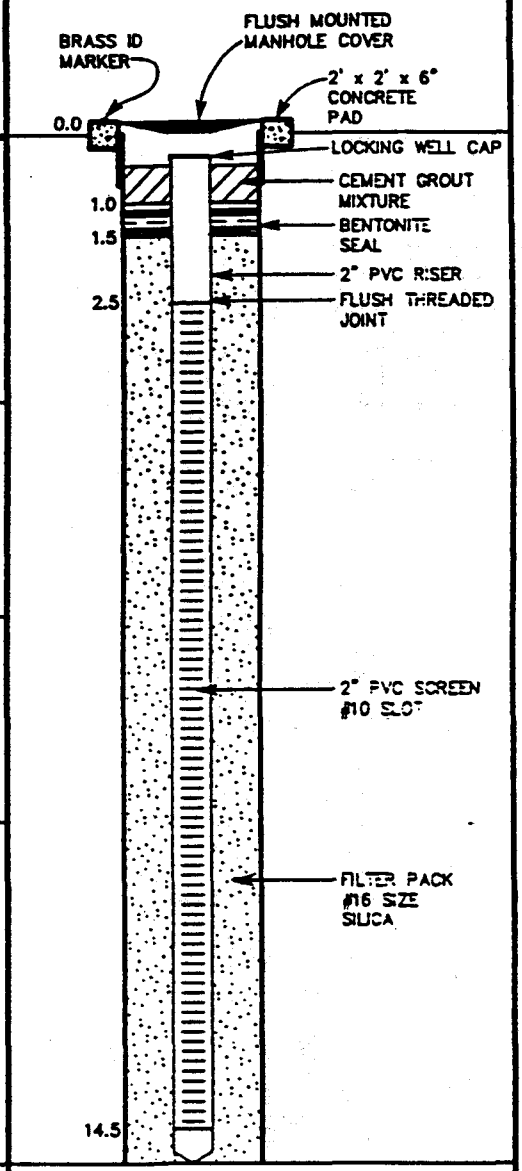
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 337, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T337-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, BROWN
			4.0
5			SILT, CLAYEY, GRAY, MOIST SLIGHT HYDROCARBON ODOR
			7.0
			SILT, CLAYEY, BROWN, MOIST
10			10.0
			SILT, CLAYEY, GRAY
			14.5 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 3, 1990
Well Completion Date: JAN. 3, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 14.5'

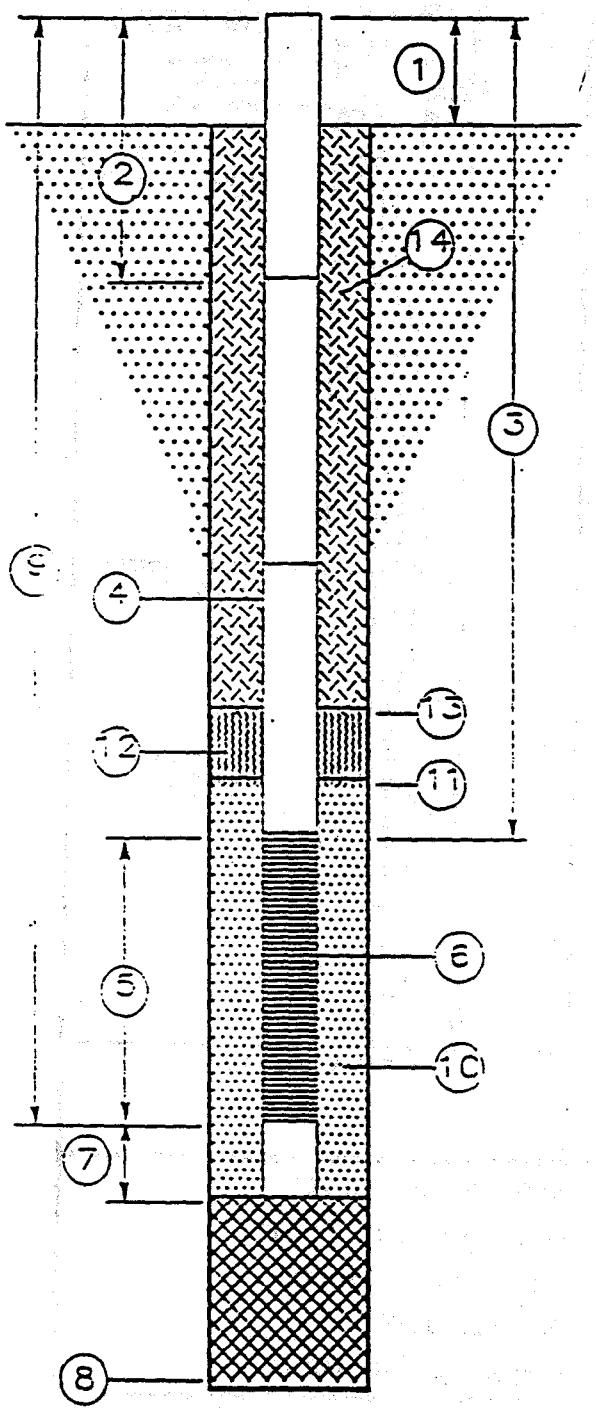
Boring Diameter: 6.75"
Ground Elevation: 271.56'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T337-2

DATE OF INSTALLATION 1-3-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

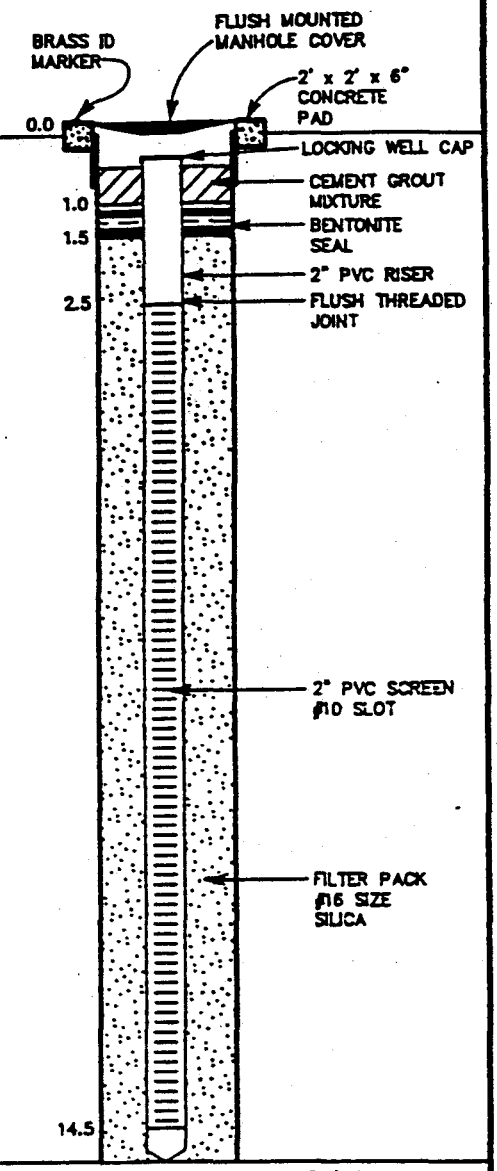
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 337, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T337-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			SILT, CLAYEY, BROWN
5			4.0
			SILT, CLAYEY, GRAY, MOIST
			7.0
			SILT, CLAYEY, BROWN, MOIST
10			
			12.0
			SILT, CLAYEY, GRAY, MOIST
			13.8 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 3, 1990
Well Completion Date: JAN. 3, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 13.8'

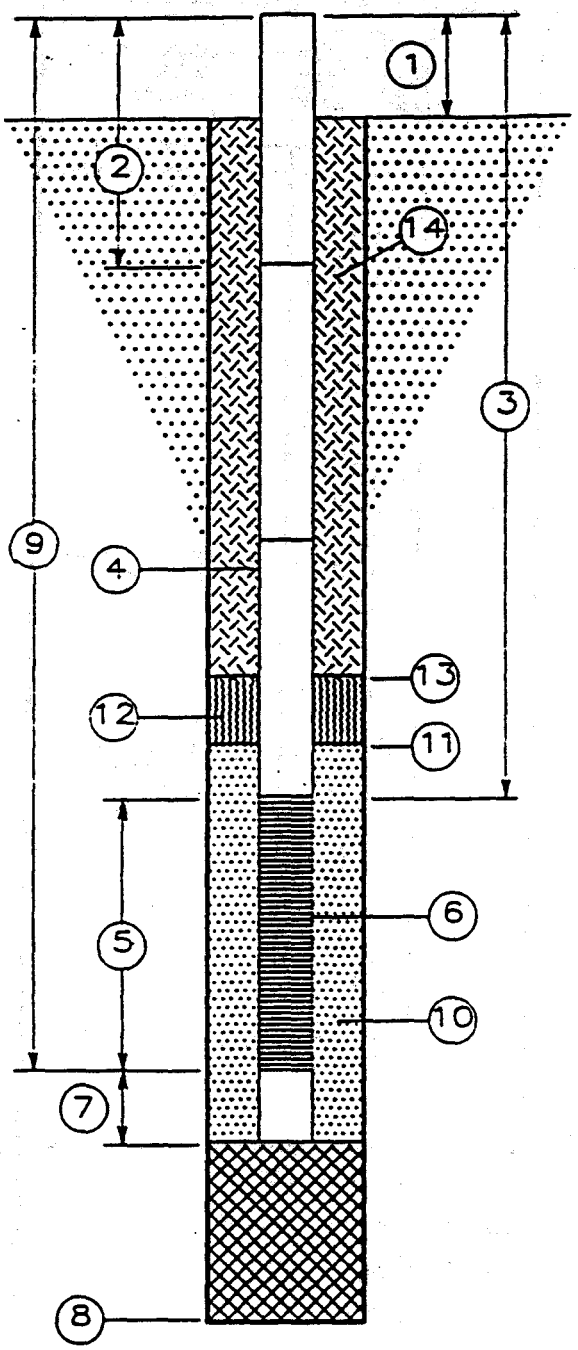
Boring Diameter: 6.75"
Ground Elevation: 271.29'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T337-3

DATE OF INSTALLATION 1/3/90



1. Height of Casing above ground 0 ft.
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft.
   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 7.5 ft.
6. Type of Screen Schedule 40 PVC (0.01")
7. Length of Sump 0 ft.
8. Total Depth of Boring 10.0 ft. Hole Diameter 6.25"
9. Depth To Bottom of Screen 10.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 1.7 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 2.0 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 0.2 ft.^{3}
13. Depth To Top of Seal 1.0 ft.
14. Type of Grout Cement
    Grout Mixture 1010%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

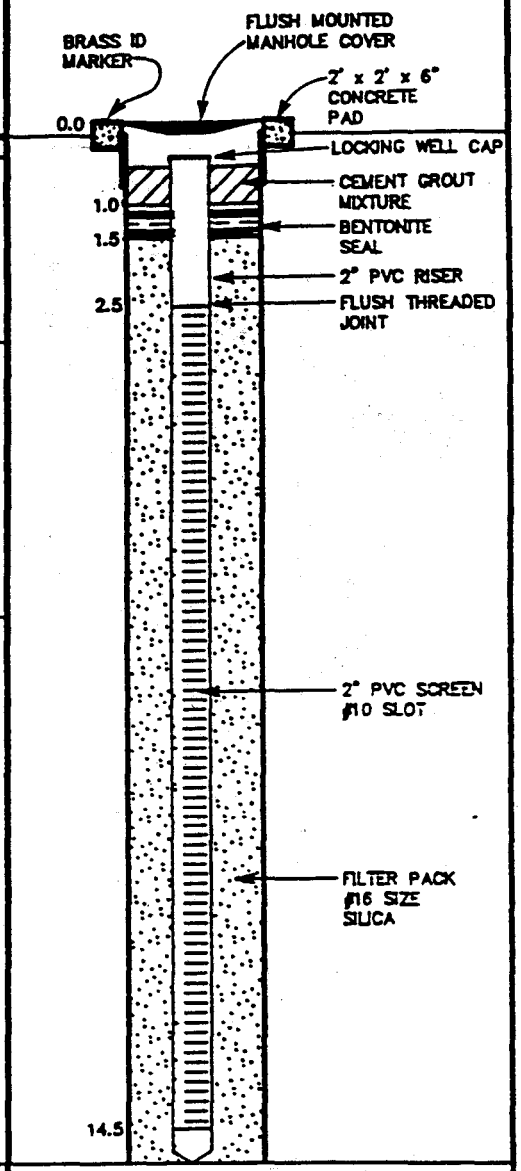
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1637, NAS, MEMPHIS, TN.

LOG OF BORING NO. A1 LOG OF WELL NO. MEM-T1637-1

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			.3 ASPHALT
			SILT, LIGHT RED, DRY
			3.0
5			SILT, CLAYEY, BROWN
			7.0
10			SILT, CLAYEY, RED, MOIST
			13.7 24 HOUR WATER LEVEL
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 5, 1990
Well Completion Date: JAN. 5, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 13.7'

Boring Diameter: 6.75"
Ground Elevation: 288.67'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

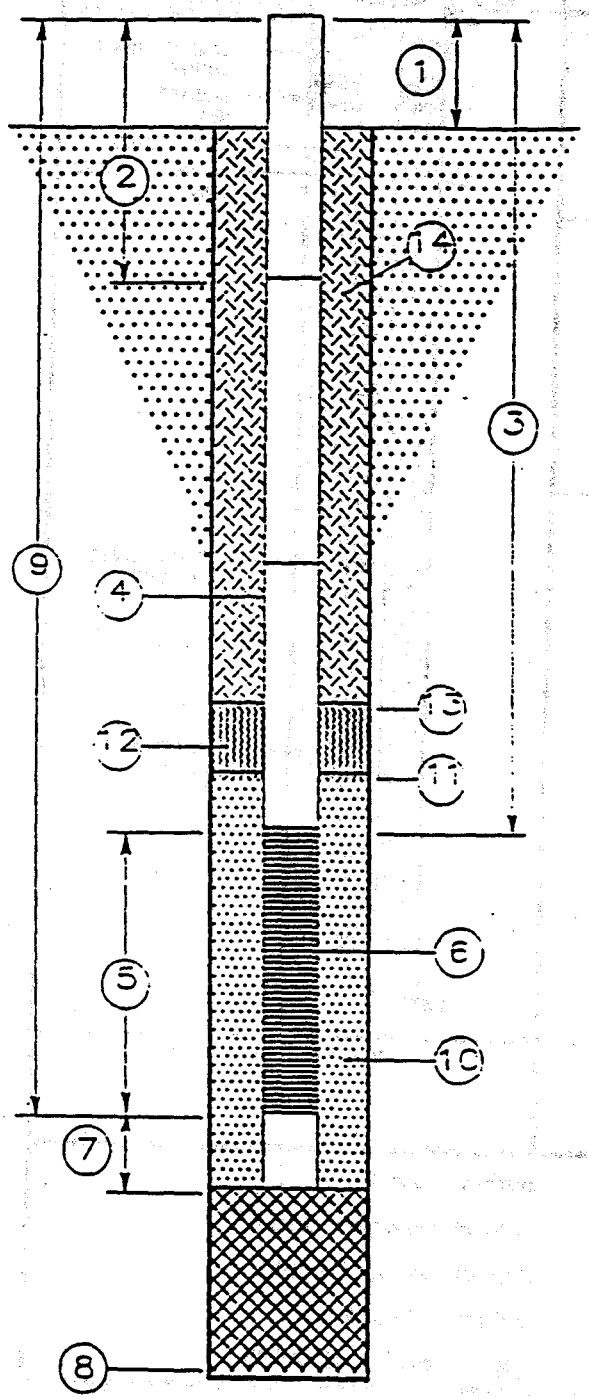
2155 EAGLE DR., P.O. BOX 10068

CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1637-1

DATE OF INSTALLATION 1-5-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.

   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand

    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets

    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement

    Grout Mixture 100%

    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

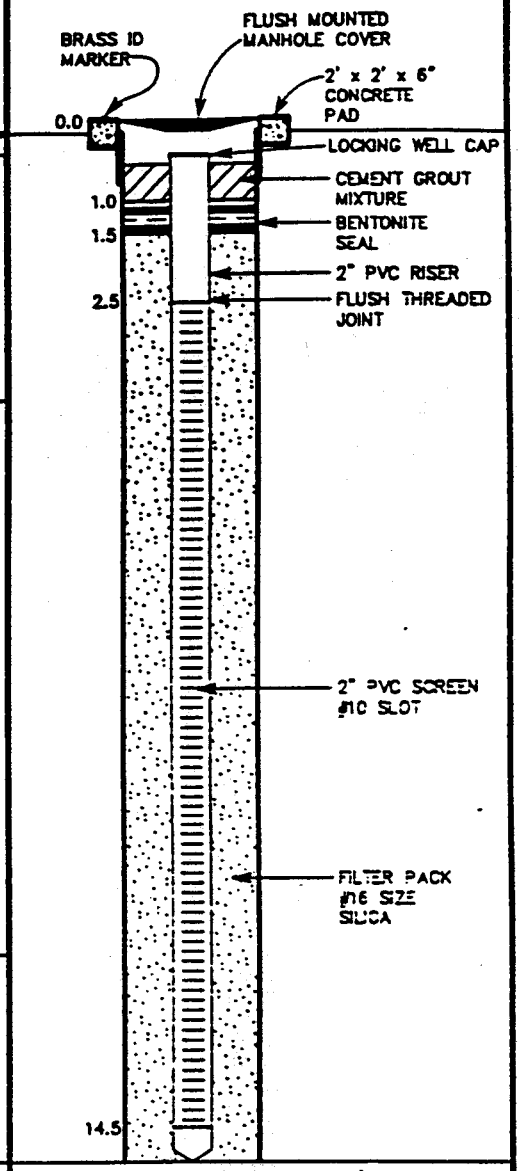
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1637, NAS, MEMPHIS, TN.

LOG OF BORING NO. A2 LOG OF WELL NO. MEM-T1637-2

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			.3 ASPHALT
			SILT, LIGHT RED
			4.0
5			SILT, LIGHT RED, WITH PEA GRAVEL
			9.3 24 HOUR WATER LEVEL
10			
			12.0
			SILT, RED, WET
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 5, 1990
Well Completion Date: JAN. 5, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 9.3'

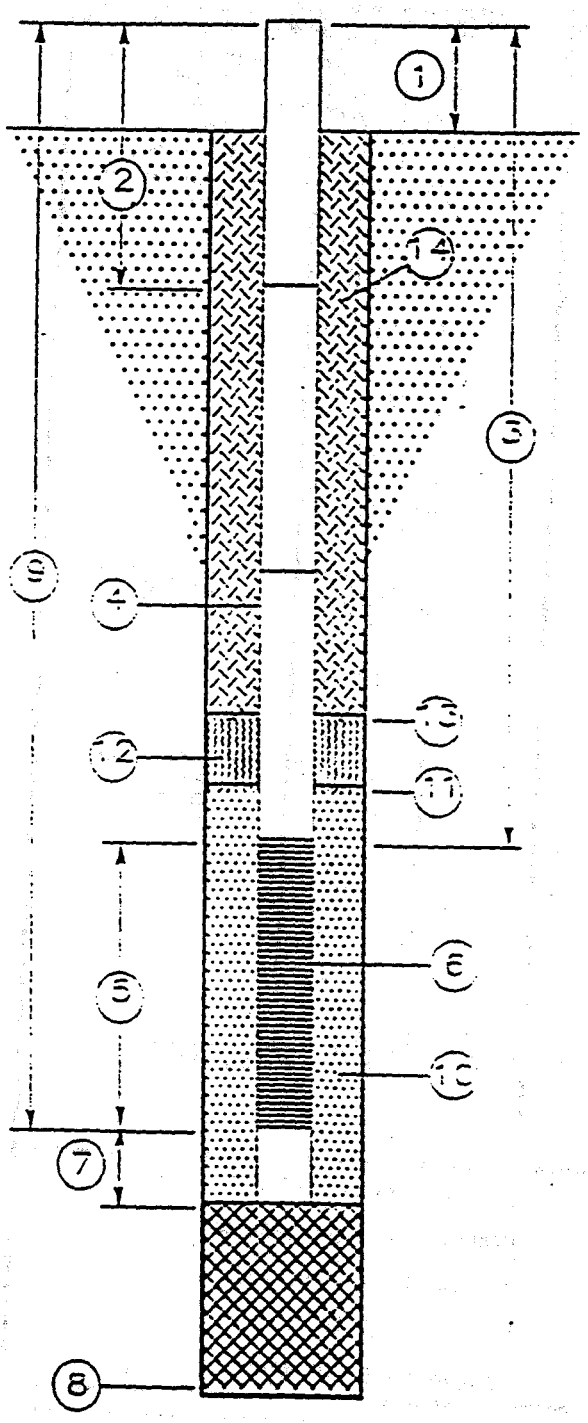
Boring Diameter: 6.75"
Ground Elevation: 288.49'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1637-2

DATE OF INSTALLATION 1-5-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft.
   15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.66 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

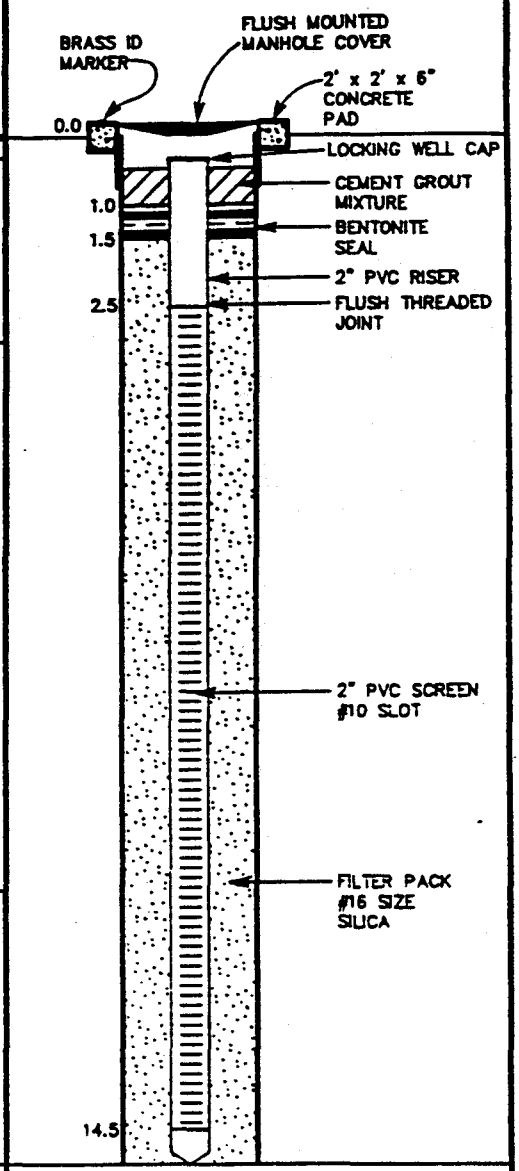
GROUNDWATER MONITORING WELL INSTALLATION REPORT

LOCATION TANK SYSTEM 1637, NAS, MEMPHIS, TN.

LOG OF BORING NO. A3 LOG OF WELL NO. MEM-T1637-3

DEPTH IN FEET	SYMBOL	SAMPLES (LAB)	MATERIAL DESCRIPTION
			.3 ASPHALT
			SILT, LIGHT RED
			3.0
5			SILT, CLAYEY, BROWN, MOIST
10			9.92 24 HOUR WATER LEVEL
			11.0
			SILT, CLAYEY, BROWN, WET
15			15.0
			TERMINATED @ 15.0

WELL CONSTRUCTION



Boring Completion Date: JAN. 5, 1990
Well Completion Date: JAN. 5, 1990
Well Development Date: N.A.
Drilling Method: POWER AUGER
Depth to Water: 9.9'

Boring Diameter: 6.75"
Ground Elevation: 288.59'
Top of Casing Elevation:
Driller: B. ELDER
Logged by: L. RICHARDS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
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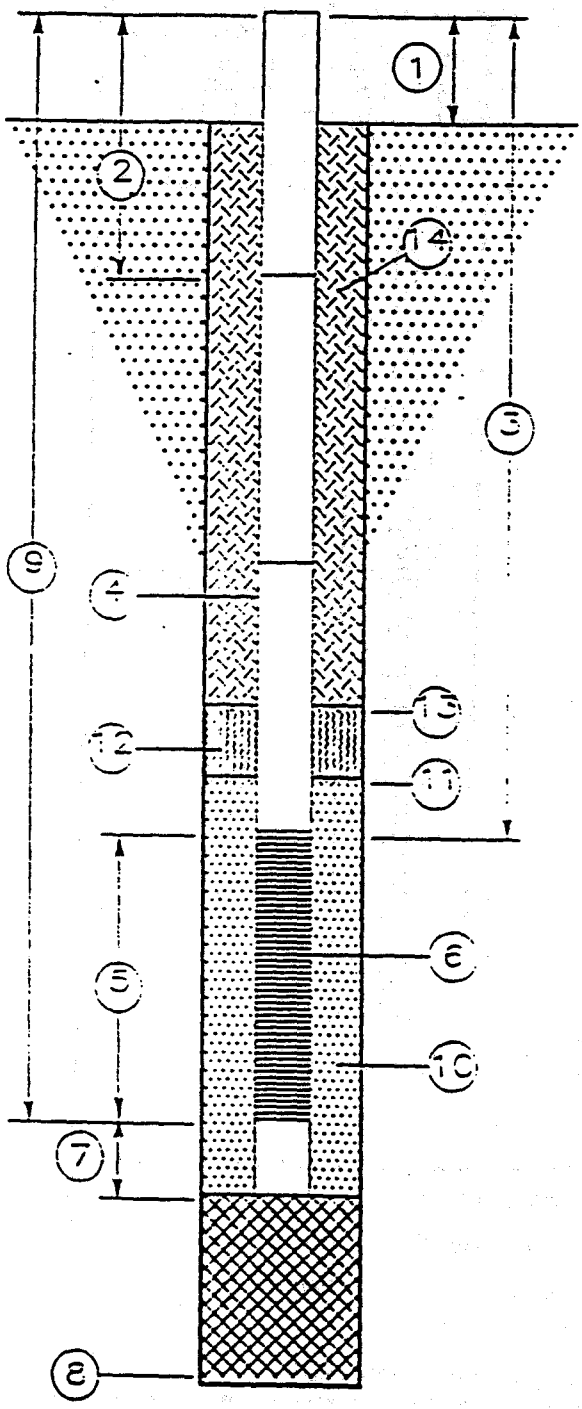
WELL CONSTRUCTION DETAILS

WELL NUMBER MEM-T1637-3

DATE OF INSTALLATION 1-5-90



1. Height of Casing above ground 2 inches
2. Depth to first Coupling 2.5 ft.
   Coupling Interval Depths 2.5 ft., 5.0 ft. 15.0 ft.
3. Total Length of Blank Pipe 2.5 ft.
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 12.5 ft.
6. Type of Screen Schedule 40 PVC (0.01" slot)
7. Length of Sump 0
8. Total Depth of Boring 15 ft. Hole Diameter 8 inch
9. Depth To Bottom of Screen 15.0 ft.
10. Type of Screen Filter Quartz sand
    Quantity Used 14.65 ft.^{3} Size #16 U/C
11. Depth To Top of Filter 1 ft.
12. Type of Seal Bentonite pellets
    Quantity Used 1.05 ft.^{3}
13. Depth To Top of Seal 0 ft.
14. Type of Grout Cement
    Grout Mixture 100%
    Method of Placement Pour

USGS MONITORING WELLS

Sh: U-101

USGS02FL

WELL CONSTRUCTION LOG

installed by U.S. Army Corps of Engineers, Memphis District

WELL LOCATION observation well cluster W of N-1694, center well

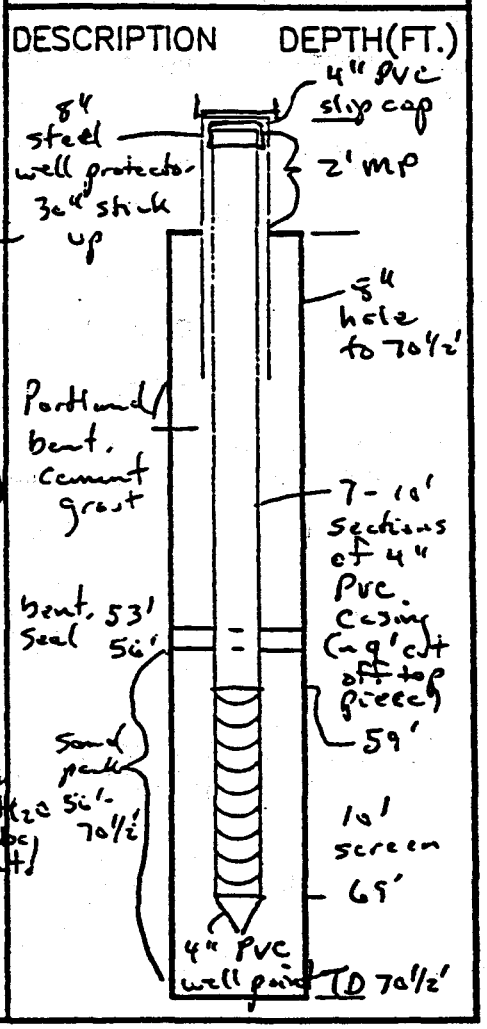
DATE INSTALLED 4/15/95 (grouted 4/15/95)

TYPE OF WELL 4" PVC observation well for water-level measurements in the fluvial deposits

1. HEIGHT OF CASING ABOVE GROUND 2'
2. WATER SURFACE ELEV. 4/26/95 18.00' BLS
   a) DEPTH TO SATURATED ZONE
3. TOP OF CASING ELEV. ~275' (land surface ~273')
4. PROTECTIVE CASING (YES) NO
   a) CASING LENGTH ~4'
5. LENGTH OF SCREEN 10'
6. SIZE\TYPE OF SCREEN 4" PVC Sch 40 #10 slot
7. LENGTH OF SUMP ~9"
8. TOTAL DEPTH OF BORING 70½' HOLE DIAMETER ~8"
9. SCREENED INTERVAL ~59'-69'
10. TYPE OF SCREEN FILTER PACK Silica Sand (10-20)
    QUANTITY USED 6 bags SIZE 50 lbs U/C
11. DEPTH TO TOP OF FILTER ~56'
12. TYPE OF SEAL bentonite pellets
    QUANTITY USED 1 50 lb bucket (3 cu ft) ~5 gallons
13. DEPTH TO TOP OF SEAL ~53'
14. TYPE OF GROUT Portland cement w/ ~5% bentonite
    GROUT MIXTURE 6 bags (100 lbs) w/ ~45 gallons H_2O
    METHOD OF PLACEMENT 1" PVC tremie pipe (2/3 bentonite)
15. COMMENTS cuttings from hole placed in 9 drums; hole drilled to 13' w/ bar auger; hyd. rotary 13'-70½'; no WL measurements made because WL in well artificially high after installation

JOB NUMBER BRAC/DERA observation wells

INSTALLATION DESCRIPTION



RFI WORK PLAN
NAS MEMPHIS
MILLINGTON, TENNESSEE

FIGURE 4-7
WELL CONSTRUCTION LOG

DATE: 08/23/94 | DWG NAME: 016WLOG

USGSOILS

WELL CONSTRUCTION LOG: WL-1L

installed by U.S. Army Corps of Engineers, Memphis District

WELL LOCATION observation well cluster w of N-1694, SE well

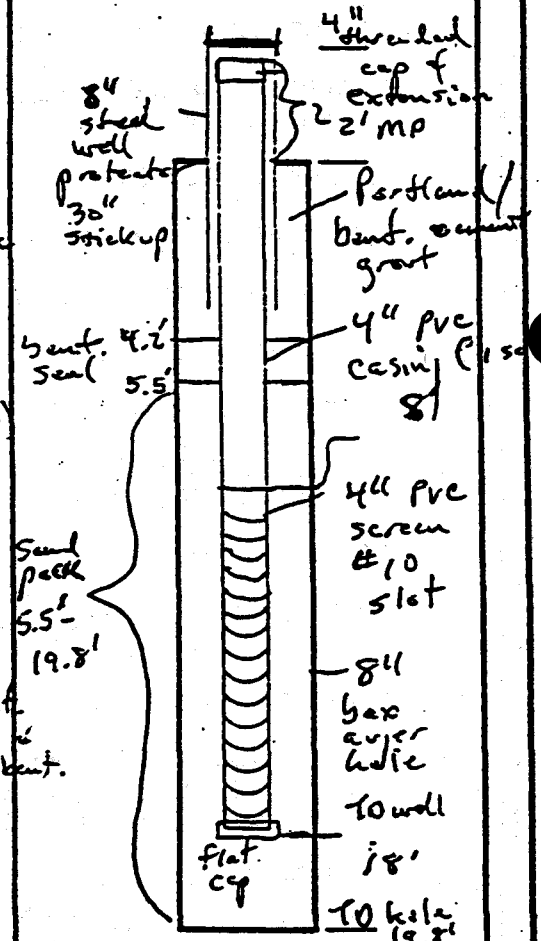
DATE INSTALLED 4/12/95 (grouted 4/14/95)

TYPE OF WELL 4" PVC observation well for water-level measurements in the loess/alluvium

1. HEIGHT OF CASING ABOVE GROUND 2'
2. WATER SURFACE ELEV. 4/15/95: 5.7' BLS
   a) DEPTH TO SATURATED ZONE ~12' (4/12/95)
3. TOP OF CASING ELEV. ~275' (land surface ~273')
4. PROTECTIVE CASING (YES) NO
   a) CASING LENGTH ~4'
5. LENGTH OF SCREEN 10'
6. SIZE\TYPE OF SCREEN 4" PVC Sch 40 #10 slot
7. LENGTH OF SUMP ~3"
8. TOTAL DEPTH OF BORING 20' HOLE DIAMETER 8" (6" JKC)
9. SCREENED INTERVAL 8'-18'
10. TYPE OF SCREEN FILTER PACK silica sand (20-40)
    QUANTITY USED 3 bags SIZE 100 lb U/C
11. DEPTH TO TOP OF FILTER ~5.5'
12. TYPE OF SEAL bentonite pellets
    QUANTITY USED 1/2 50 lb bucket (1 cuft) ~25 gallons
13. DEPTH TO TOP OF SEAL ~4.2'
14. TYPE OF GROUT Portland cement w/ ~5% bent.
    GROUT MIXTURE 2-100 lb bags w/ ~12 1/2 gallons H_2O ~16 oz bent.
    METHOD OF PLACEMENT pouring
15. COMMENTS cuttings from hole placed in one drum. hole drilled w/ 8" box auger; WL originally had Q ~12' BLS, but rose to ~5'-6' BLS after ~24 hours

INSTALLATION DESCRIPTION

DESCRIPTION DEPTH(FT.)



JOB NUMBER BRAC/DERA observation wells

RFI WORK PLAN
NAS MEMPHIS
MILLINGTON, TENNESSEE

FIGURE 4-7
WELL CONSTRUCTION LOG

DATE: 09/23/94 | DWG NAME: 016WLOG

DN: U-102

USGS034C

WELL CONSTRUCTION LOG. WL-1 Cluster

Installed by U.S. Army Corps of Engineers, Memphis District

WELL LOCATION observation well cluster w of N-1624, NW well

DATE INSTALLED 4/14/95 (grouted 4/15/95)

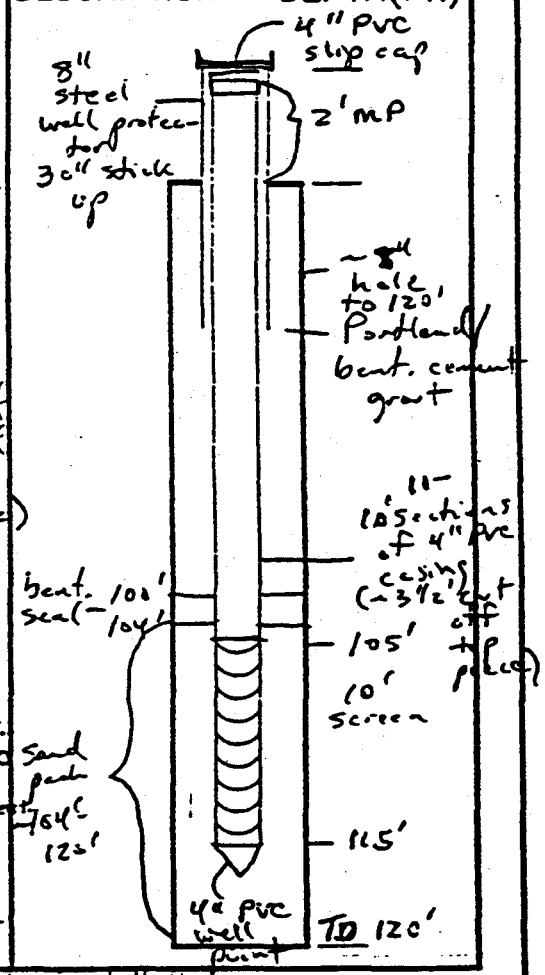
TYPE OF WELL 4" PVC observation well for water-level measurements in the Cockfield Formation

1. HEIGHT OF CASING ABOVE GROUND 2'
2. WATER SURFACE ELEV. 4/26/95 14.78' BLS.
   a) DEPTH TO SATURATED ZONE
3. TOP OF CASING ELEV. ~275' (land surface ~273')
4. PROTECTIVE CASING (YES) NO
   a) CASING LENGTH ~4'
5. LENGTH OF SCREEN 10'
6. SIZE\TYPE OF SCREEN 4" PVC Sch 40 #10 slot
7. LENGTH OF SUMP ~9"
8. TOTAL DEPTH OF BORING 120' HOLE DIAMETER ~8"
9. SCREENED INTERVAL ~105'-115'
10. TYPE OF SCREEN FILTER PACK silica sand (10-20 & 20-40 &)
    QUANTITY USED 120 lbs each, 200 lbs total, + SIZE ____ U/C ____ natural gravel collapse)
11. DEPTH TO TOP OF FILTER ~104'
12. TYPE OF SEAL bentonite pellets
    QUANTITY USED 1 1/2 50 lb bucket (.cu ft) ~7.5 gallons
13. DEPTH TO TOP OF SEAL ~100'
14. TYPE OF GROUT Portland cement w/ ~5% bent.
    GROUT MIXTURE 9 bags (100 lbs) w ~66 gallons H_2O
    METHOD OF PLACEMENT 1" PVC tremie pipe + 1 1/3 bags bent.
15. COMMENTS cuttings from hole placed in 15 drums; hole drilled to 12' w/ box auger. hyd. rotary 12'-122'; Shelby tube sample from 12'-14' & 120'-122.5'; no WL measurements made because WL in well artificially high after installation

JOB NUMBER BRAC/DERA observation wells

INSTALLATION DESCRIPTION

DESCRIPTION DEPTH(FT.)



RFI WORK PLAN
NAS MEMPHIS
MILLINGTON, TENNESSEE

FIGURE 4-7
WELL CONSTRUCTION LOG

DATE: 08/23/94 | DWG NAME: 016WLOG

USGS04FL

WELL CONSTRUCTION LOG: WL-2

installed by U.S. Geological Survey, Tennessee Dist.

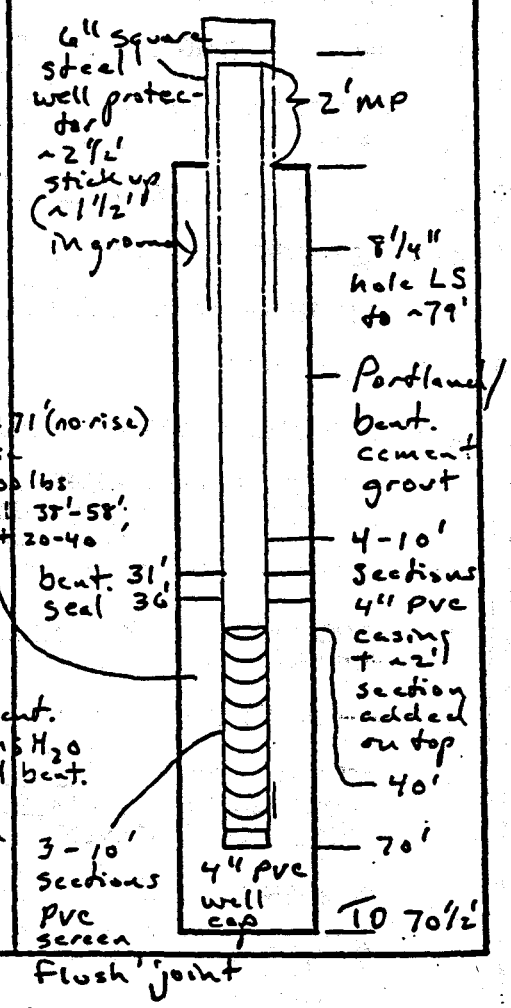
WELL LOCATION observation well 75' ENE of observation well cluster WL-1, west of N-1494

DATE INSTALLED 8/19/95 (grout & pad completed)

TYPE OF WELL 4" PVC observation/production well for aquifer test in the fluvial deposits

1. HEIGHT OF CASING ABOVE GROUND ~2'
2. WATER SURFACE ELEV. 18.8' BLS 8/18/95
   a) DEPTH TO SATURATED ZONE
3. TOP OF CASING ELEV. ~275' (land surface ~273')
4. PROTECTIVE CASING YES NO
   a) CASING LENGTH ~4'
5. LENGTH OF SCREEN 30'
6. SIZE\TYPE OF SCREEN 4" PVC sch 40 #10 slot flush joint
7. LENGTH OF SUMP ~9"
8. TOTAL DEPTH OF BORING ~79' HOLE DIAMETER 8 1/4"
9. SCREENED INTERVAL ~40'-70'
10. TYPE OF SCREEN FILTER PACK 6 bags 10-20 sand ~71' (no rise)
    QUANTITY USED ___ SIZE ___ U/C natural collapse ~58'-70'; 3-40 lbs 1/4"-3/8" p. gravel 38'-58'; 1-5 gal bucket 20-40
11. DEPTH TO TOP OF FILTER ~36'
12. TYPE OF SEAL bentonite pellets, sand 36'-38'
    QUANTITY USED 1/2", 5 gallons
13. DEPTH TO TOP OF SEAL 31'
14. TYPE OF GROUT Portland cement w/ ~5% bent.
    GROUT MIXTURE 12 bags (100 lbs) w/ ~35 gallons H_2O & bent.
    METHOD OF PLACEMENT poured from 55 gal. drum
15. COMMENTS cuttings & mud from hole placed in 17 drums

INSTALLATION DESCRIPTION



JOB NUMBER BRAC/DERA observation wells

RFI WORK PLAN
NAS MEMPHIS
MILLINGTON, TENNESSEE

FIGURE 4-7
WELL CONSTRUCTION LOG

DATE: 08/23/94 | DWG NAME: 016WLOG

FIELD BORING LOG

HOLE NO. ____

SHEET ____ OF ____

PROJECT 7)L # 1C LOCATION Mph. Navy Base-North

DRILL RIG F-1500 INSPECTOR Farr OPERATOR Dyce

DEPTH OF WATER 8.0' DATE 4/12/95 TABLE 5.9' DATE 4/13/95

ELEVATION OF GROUND ____ MUD 15.0'

Sample Number	Date	Sample From	Sample To	Stratum From	Stratum To	Classification Remarks	Type Sampler
	4/12/95	0.0	1.0	0.0	2.0	Br. silt w/clay moist	Auger
		2.0	3.0	2.0		Br. lean clay w/silt, w/ss	↓
		5.0	6.0			Br. & Gr. silty clay, ox, w/ss.	↓
		7.0	8.0		12.0	Br & Gr. lean clay, organic, ox, w/ss	
		12.0	14.5	12.0	18.0	Gr. silt	3" Tube
		20.0	30.0	18.0	41.0	Gr. fat clay, organic	Jet
		50.0		41.0	52.0	Gr. clayey sand	↓
		52.0		52.0	76.0	Br. gravel	↓
		80.0		76.0	85.0	Gr. clayey sand w/gravel	↓
		90.0		85.0	97.0	Gr. silty clay w/gravel	↓
		100.0		97.0	120.0	Br. silty clay	↓
		120.0	122.0	120.0		BK fat clay, w/fine sand - Tertiary	3" Tube

LEGEND

SWMU 14 — SWMU NO. AND LOCATION

260 — CONTOURS (4' INTERVAL)

600 0 600
SCALE FEET

SOURCE: U.S. NAVY

RFI REPORT
NSA MEMPHIS
MILLINGTON, TN.

FIGURE 1
LAND SURFACE ELEVATION MAP
SOUTHSIDE OF NSA MEMPHIS

Dr by: E/AH	Tr by: E/AH	
Ck by: A. CHOATE	App by: E/AH	Sheet 1
Date: 01/12/98	DWG Name: 106SEMSO	Of 1

● SE Quad Open/AG
▲ SE Quad Open/FG
● SE Quad Closed/AG
▲ SE Quad Closed/FG
Building
Roads

300 0 300 600 900 Feet

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

NSA Mid-South Well Locations
SE Quadrant

NSA Mid-South
Millington, Tennessee
Groundwater Well Management Plan

28 Sept 1999

D:\ceb\millington\pritts\quads\quads-se\lyt1

● NW Quad Open/AG

▲ NW Quad Open/FG

◉ NW Quad Closed/AG

△ NW Quad Closed/FG

Building

Roads

300 0 300 600 900 Feet

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

NSA Mid-South Well Locations
NW Quadrant

NSA Mid-South
Millington, Tennessee
Groundwater Well Management Plan

29 Sept 1999

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- NE Quad Open/AG
- NE Quad Open/FG
- NE Quad Closed/AG
- NE Quad Closed/FG
- Building
- Roads

300 0 300 600 900 Feet

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

NSA Mid-South Well Locations
NE Quadrant

NSA Mid-South
Millington, Tennessee
Groundwater Well Management Plan

29 Sept 1999

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● SW Quad Open/AG

▲ SW Quad Open/FG

○ SW Quad Closed/AG

△ SW Quad Closed/FG

Building

Roads

300 0 300 600 900 Feet

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

NSA Mid-South Well Locations
SW Quadrant

NSA Mid-South
Millington, Tennessee
Groundwater Well Management Plan

29 Sept 1999

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