SPECIALIZING IN SOILS
EXPLORATION, PHYSICAL
TESTING, ENGINEERING AND
NDT EXAMINATION SERVICES

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FINAL REPORT
L-30 SEEPAGE MANAGEMENT PILOT PROJECT
WATER CONSERVATION AREA 3B
MIAMI-DADE COUNTY, FLORIDA

Contract # W912EP-05-D-0010
Delivery Order # 0003
Challenge Engineering & Testing, Inc.

Prepared For:

U.S. Army Corps of Engineers – Jacksonville District
Geotechnical Branch
701 San Marco Boulevard
Jacksonville, Florida 32207

Submitted By:

Challenge Engineering & Testing, Inc.
4234 Halls Mill Road
Mobile, Alabama 36691

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MIAMI-DADE COUNTY, FLORIDA

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PURPOSE OF PROJECT

The U.S. Army Corps of Engineers is interested in determining the type, nature, and characteristics of lithological units that include the Biscayne Aquifer and the extent and conditions of the various materials as they exist to the depths at each of the locations specified.

The purpose of the L-30 Seepage Management Pilot Project (SMPP) is to address seepage management issues along the L-30 Canal related to the onset of other Comprehensive Everglades Restoration Plan (CERP) projects within the next five years.

The Pilot project is being conducted to provide information to determine the appropriate amount of wet season groundwater flow to return to the Everglades National Park (ENP) while minimizing potential impacts to the Miami-Dade West Well field and freshwater flows to Biscayne Bay.

This project is located west of Miami, Florida, northwest of the Tamiami Trail (US41) and Krome Avenue (Route 997). Work was performed along the top to the L-30 Canal Levee which runs mainly north-south and makes a 45 degree southwesterly departure from Krome Avenue toward the Tamiami Trail, commonly known as the “L-30 Triangle.”

Challenge Engineering & Testing, Inc. of Mobile, Alabama was requested to assist the Jacksonville District of The U.S. Army Corps of Engineers on this contract.

SCOPE OF WORK

The scope of work consisted of performing in the upland (landside along top of L-30 levee) and in the freshwater wetland environment of the Water Conservation Area 3B the following:

- Core Drilling
- Wireline Core & Splitspoon Sampling
- Installation of Groundwater Monitoring Wells

Authorization to proceed with the requested tasks was issued on September 18th, 2006, Contract #W912EP-05-D-0010 – Delivery Order #0003 by the U.S. Army Corps of Engineers – Jacksonville District.

Field work was requested to be completed by November 19, 2006 for this assignment order.

PROCEDURES AND PROJECT SPECIFICATIONS

This report presents the procedures as followed for the borehole location, soil sampling and the classification of each respective soil sample in conjunction with special notes as recorded regarding conditions encountered in the field.

U.S. Army Corps of Engineer Standard Boring Log Forms 1836 are completed for each core boring performed in the designated location as generated with the Geotechnical Integrator "gINT" Software Program and script/library files as furnished by the Jacksonville District.

Drilling techniques and equipment were in general accordance with the prescribed technical provisions as stated in the Department of the Army Engineering Manual EM-1110-2-1907, "Soil Sampling" Publication.

FIELD WORK PERFORMED

PHASE I: TOP OF L-30 LEVEE LANDSIDE CORE BORINGS / WELL INSTALLATION

The landside well drilling phase of work on this project consisted of performing numerous tasks along the top of the L-30 Levee in designated test locations.

Boreholes were located utilizing the x-y coordinates as furnished by the Jacksonville District of the U.S. Army Corps of Engineers and converted by Corpscon to latitude/longitude for GPS location.

Three (3) borings were designated to be located along the top of the levee in the center of the roadway.

In each of the locations the following tasks were performed:

- Large diameter (10") roller bit was used to drill through the levee to top of rock
- PVC (8") surface casing set to top of rock
- Wireline rock coring was commenced with a five foot 4" x 5 ½" core barrel to the base of the rock formation with fresh water
- Boreholes were reamed with a seven and one-half inch (7.5") bit
- Boreholes developed for a period of three (3) hours with compressed air
- U.S. Geological Survey was notified of field progress
- Boreholes were allowed to remain for a minimum of 72 hours
- Borehole logging was performed by U.S.G.S.
- After approximately 7 days, drillcrew returned to perform continuous splitspoon sampling for an additional 30 feet
- Boreholes were backfilled with gravel and crushed limestone

The rig used on this project was a CME-55 four (4) wheel drive truck mounted hydraulic drill unit equipped with a standard manual 140 lb. splitspoon drive hammer and a Moyno reciprocating cavity unit pump.

Groundwater monitoring wells were installed approximately 10 ft. from each of the large diameter boreholes along the backside (south-canal)) top of levee. The construction consisted of two (2) inch diameter schedule 40 Johnson threaded joint “Tri-Lock” PVC installed with two (2) feet of 0.060” slotted screen.

Pea gravel backfill was used to fill the annulus around the screen.

A seal of 3/8” bentonite pellets was placed above the pea gravel. The remaining borehole annulus was backfilled with crushed limestone and gravel to the surface.

Flush mount security covers were completed encased in a three (3) foot by three (3) foot concrete pad. Locking top caps were placed on the well pipe.

The base of the Fort Thompson Formation was noted for each of the borings and reported in the below table. Splitspoon sampling was conducted for thirty (30) feet in the Pinecrest Sands below the Ft. Thompson Formation.

The computed horizontal coordinates for each of the borings to Florida East – NAD 83 State Plane Coordinates and vertical elevations to NAVD 1988 are reported as follows:

BORING/WELL DRILLING TEST LOCATIONS

Boring/Well Number	NAD 1983 Florida East Northing	Easting	Elevation (Ft.)	Base of Ft. Thompson
CP06-L30PP-CB-0001	**524279**	**826073**	**17.27**	**- 57.7**
CP06-L30PP-CB-0002	**522044**	**823753**	**17.49**	**- 62.5**
CP06-L30PP-CB-0003	**519743**	**821358**	**17.19**	**- 57.1**
			Top of Casing	
CP06-L30PP-MW-0001	**524270**	**826074**	**17.12**	
CP06-L30PP-MW-0002	**522036**	**823753**	**17.10**	
CP06-L30PP-MW-0003	**519734**	**821356**	**16.87**	

PHASE II:
WATER CONSERVATION AREA 3B
FRESHWATER WETLAND WELLS

Two (2) locations in the WCA3B were designated for monitoring wells and platforms to be constructed

Each site was drilled to termination depth with an amphibious track mounted drill setup. The wells were constructed and developed in the same manner as described above for the upland L-30 levee.

Surface casing consisted of installing six (6) inch schedule 80 PVC casing around the well and strapped to a four legged 2” galvanized steel pipe platform with a 48” treated wooden work deck.

WELL DRILLING TEST LOCATIONS

Boring/Well Number	NAD 1983 Florida East Northing	Easting	Top Of Casing
CP06-L30PP-MW-0004	**526589**	**821601**	**12.00**
CP06-L30PP-MW-0005	**528482**	**824038**	**13.55**

WELL DEVELOPMENT

The large diameter seven and one-half (7.5) inch boreholes were developed by insertion of tremmie pipe to the base of the reamed boreholes and using compressed air as supplied by a portable 185 CFM compressor to lift and blow out water and debris from boreholes. Each was developed for a period of a minimum of three (3) hours as the well was noted to produce “clear water”.

Air bubbles were noted to be present rising to the surface waters on both sides of the levee for a distance of up to 105 feet from the well for a period of time of at least 20 minutes following development.

Each of the two (2) inch permanent groundwater monitoring wells was developed by pumping and surging until “clear” water was produced.

As per project specifications, an inventory of core boxes as prepared in the gINT format was submitted to Mrs. Karen Pitchford. The samples were placed in labeled wooden core boxes and delivered to the Corps of Engineer Warehouse on Talleyrand Avenue in Jacksonville, Florida on November 8, 2006. The core boxes were verified received by Mr. Mark Whitson and Dr. June Mirecki of the U.S. Army Corps of Engineers.

REPORT SUBMITTALS

The field boring logs, visual classifications and test results were all entered into the Geotechnical Integrator (gINT) software format as designed by the Jacksonville District which is presented as part of this report.

Digital project photographs were taken throughout the duration of the field work to document progress. Some the photographs are found attached as part of this report to include completed well installations.

Monitoring well construction diagrams are completed for each well.

FIELD EXPLORATION SUMMARY CONCLUSION

Coordination of field activities was conducted with Mr. Keith Price, Miami Field Office of the South Florida Water Management District during the term of this project.

During the field work on this project, coordination and updates were provided to Mr. Kevin Cunningham of the U.S. Geological Survey and U.S. Army Corps of Engineers Project Geologist Dr. June Mirecki of the Jacksonville District.

A special work permit was secured by Challenge Engineering Testing, Inc, through the Florida Fish and Wildlife Conservation Commission to work in the area due to excessive high water and public usage restrictions.

Challenge Engineering & Testing, Inc. has made every attempt to conduct this field project according to the project specifications and at the direction & satisfaction of all parties involved.

REPORT INVESTIGATION LIMITATIONS

The core borings, installation of the groundwater monitoring wells, analyses and recommendations submitted in this preliminary report are based on the data obtained from the field explorations performed at the locations depicted on the site plan. These locations were chosen by the U.S. Army Corps of Engineers, Jacksonville District. The area explored is limited to the depth and diameter of the core borings. This report does not reflect any variations which may occur adjacent to or between the core borings. The nature and extent of the variations between the borings may not become evident until during future excavations or construction in the area.

This report is based on relatively shallow explorations and a scope of work determined solely by the Corps of Engineers. This report does not include an evaluation of the environmental (ecological or hazardous/toxic material related) condition of the site and subsurface.

This report has been prepared for the exclusive use of the U.S. Army Corps of Engineers in accordance with generally accepted soil and foundation engineering practices.

It has been our pleasure for Challenge Engineering & Testing, Inc. to provide the U.S. Army Corps of Engineers – Jacksonville District our geotechnical engineering testing services on this project along the L-30 Levee & in the Water Conservation Area 3B.

I trust that you will find this submittal to be in general conformance with the project guidelines and specifications.

Respectfully Submitted,
Challenge Engineering & Testing, Inc.

V. J. Thompson III, P.E.
Florida Registration # 37610

REFERENCE PROJECT PHOTOGRAPHS

8” SURFACE PVC CASING WAS SET AT EACH OF THE LARGE DIAMETER BORING LOCATIONS

4” WIRELINE CORING SYSTEM USED TO SAMPLE TO ROCK

7.5” OPEN BOREHOLES BEING AIR LIFTED WITH COMPRESSOR FOR 3 HOURS EACH PRIOR TO BEING LOGGED BY THE U.S.G.S.

AIR BUBBLES WERE NOTED TO BE PRESENT ON BOTH SIDES OF THE LEVEE UP TO 105 FT. FROM BOREHOLES 10 MINUTES AFTER COMPRESSOR SHUTDOWN

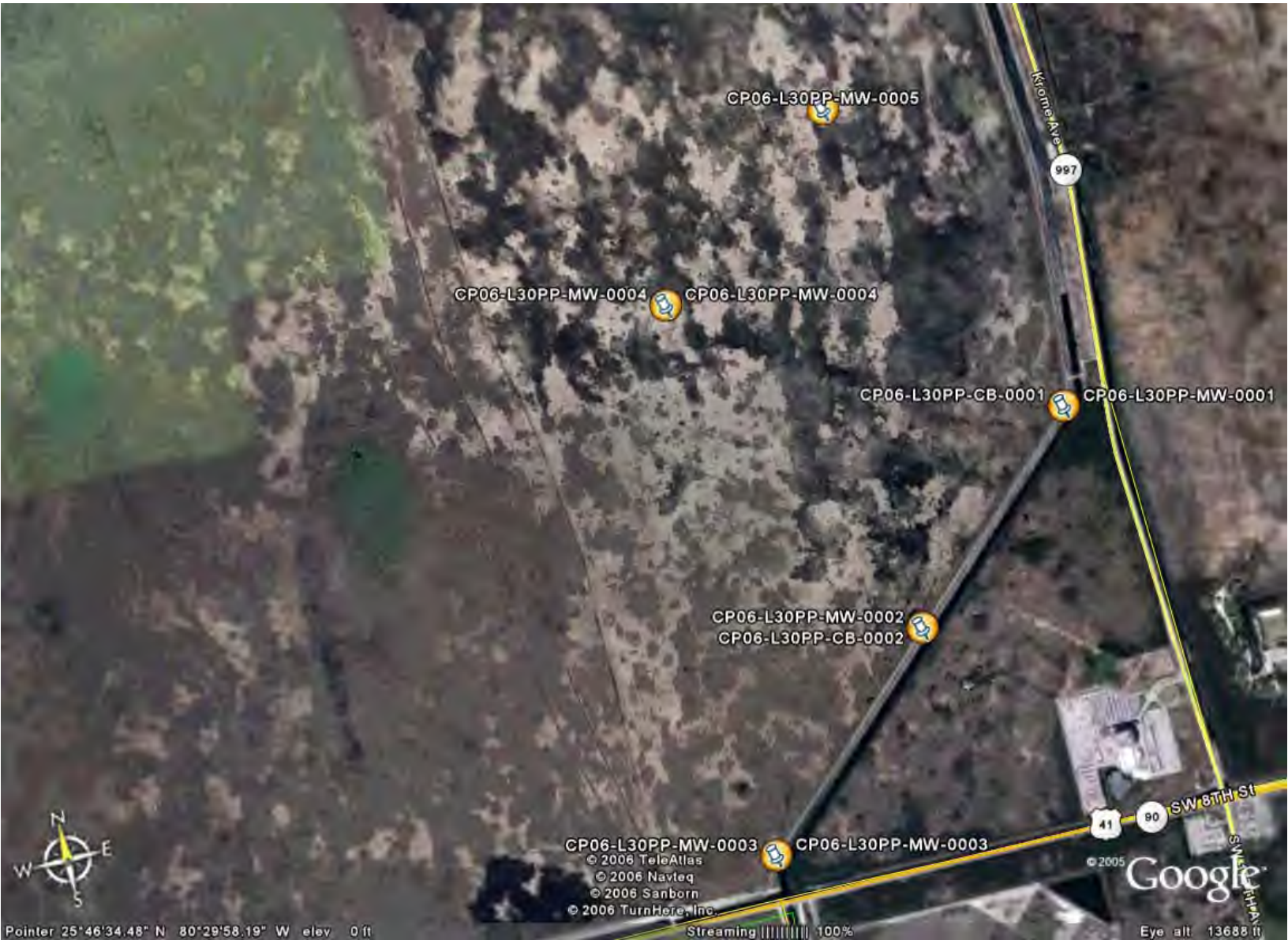
FLUSH MOUNT MONITORING WELL PADS CONSTRUCTED ON TOP OF L-30. GPS POSITIONING CONDUCTED ON WELL CASING

COMPLETED FLUSH MOUNT WELL PAD ON SOUTHSIDE OF L-30 WITH BOLTDOWN MANHOLE COVER

ATV SWAMP MOUNTED DRILL BUGGY ON-SITE

MONITORING WELL PLATFORM

BORING LOCATION MAP



LOCATION OF CORE BORINGS AND MONITORING WELLS
L-30 SEEPAGE MANAGEMENT PILOT PROJECT
DADE COUNTY, FLORIDA

SOILS TEST CORE BORING NUMBER "CP06-L30PP-CB-0001"

Miami-Dade County, Florida

DRILLING LOG

DIVISION South Atlantic	**INSTALLATION** Jacksonville District	**SHEET** 1 **OF** 6 **SHEETS**	
1. PROJECT L-30 Seepage Management Pilot Project; Top Of Levee L-30 (Center of Roadway)	**9. SIZE AND TYPE OF BIT** See Remarks		
	10. COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	**HORIZONTAL** NAD83	**VERTICAL** NAVD88
2. BORING DESIGNATION CP06-L30PP-CB-0001	**LOCATION COORDINATES** X = 826,073 Y = 524,279	**11. MANUFACTURER'S DESIGNATION OF DRILL** CME 55 Truckrig	☐ AUTO HAMMER ☒ MANUAL HAMMER
3. DRILLING AGENCY Challenge Engineering & Testing, Inc.	**CONTRACTOR FILE NO.** 2006D30	**12. TOTAL SAMPLES**	**DISTURBED** 33 / **UNDISTURBED (UD)** 0
4. NAME OF DRILLER Adam Benson		**13. TOTAL NUMBER CORE BOXES** 5	
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED	**DEG. FROM VERTICAL**	**BEARING**	**14. ELEVATION GROUND WATER** 5.0 Ft.
		15. DATE BORING	**STARTED** 10-04-06 / **COMPLETED** 10-17-06
6. THICKNESS OF OVERBURDEN N/A		**16. ELEVATION TOP OF BORING** 17.3 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		**17. TOTAL RECOVERY FOR BORING** 79 %	
8. TOTAL DEPTH OF BORING 105.0 Ft.		**18. SIGNATURE AND TITLE OF INSPECTOR** Bob Momberger, Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
17.3	0.0						17.3		
			L-30 Levee Fill Material				Advanced Boring w/ tricone roller bit		

0 5 10 15

(Continued)

Boring Designation CP06-L30PP-CB-0001

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 826,073 Y = 524,279	17.3 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring w/ tricone roller bit		
-0.2	17.5						-0.2		
		Moderately Weathered	LIMESTONE, oolitic, fossiliferous, moderately hard, moderately weathered, aphanitic, pitted, Ft. Thompson Formation, 5Y 8/2 pale yellow	80	1	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 1 mins HP = 250 psi DFR = 25 %		
							-2.7		
			From El. -2.7 to -11.2 Ft., weathered, thick bedding, vuggy	80	2	RQD 25	4 x 5-1/2" Diamond Impregnated Bit DT = 7 mins HP = 250 psi DFR = 25 %		
		Weathered			BOX 1		-7.7		
				80	3	RQD 30	4 x 5-1/2" Diamond Impregnated Bit DT = 7 mins HP = 250 psi DFR = 0 %		
			From El. -11.2 to -12.7 Ft., soft, 5Y 8/1 white				-12.7		
		Slightly Weathered	From El. -12.7 to -17.7 Ft., moderately hard, slightly weathered, thick bedding, vuggy, 5Y 8/2 pale yellow	100	4	RQD 80	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
					BOX 2		-17.7		

Boring Designation CP06-L30PP-CB-0001

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 3 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 826,073 Y = 524,279	17.3 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			From El. -17.7 to -31.7 Ft., unweathered, aphanitic, massive bedding, vuggy, sand filled vugs, 5Y 8/1 white	90	5 BOX 2	RQD 70	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
							-22.7		
			At El. -22.7 Ft., 2.5Y 8/1 white	100	6	RQD 100	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
							-27.7		
				65	7 BOX 3	RQD 43	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
			From El. -31.7 to -32.7 Ft., fossiliferous, soft, porous, 5Y 8/1 white				-32.7		
			From El. -32.7 to -37.7 Ft., moderately hard, thin bedding, vuggy	50	8	RQD 20	4 x 5-1/2" Diamond Impregnated Bit DT = 5 mins HP = 250 psi DFR = 0 %		
							-37.7		

Unweathered

35 40 45 50 55

Boring Designation CP06-L30PP-CB-0001

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 4 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 826,073 Y = 524,279	17.3 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
		Unweathered	From El. -37.7 to -47.7 Ft., medium bedding, vuggy, 2.5Y 8/1 white	50	BOX 3 9	RQD 20	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
							-42.7		
				100	BOX 4 10	RQD 55	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
							-47.7		
			From El. -47.7 to -52.7 Ft., thick bedding, vuggy, clay filled vugs, 2.5Y 7/1 light gray	100	11	RQD 90	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
							-52.7		
			From El. -52.7 to -57.7 Ft., thin bedding, sand filled vugs	25	BOX 5 12	RQD 25	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
-57.7	75.0						-57.7		

55 60 65 70 75

SAJ FORM 1836-A
JUN 02

Boring Designation CP06-L30PP-CB-0001

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 5 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 826,073 Y = 524,279	17.3 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-57.8	75.1		SAND, silty, mostly carbonate, Pinecrest Sand Formation (SM)	0	13	RQD 0	4 x 5-1/2" Diamond Impregnated Bit	WOH	
			SHELL, mostly angular coarse gravel-sized flat and elongated shell up to 1", some coarse gravel-sized limestone up to 1-1/2", strong reaction with HCl, wet, 10Y 8/1 light greenish gray	27	14		SPT Sampler	0	0
							-59.2	0	
				27	15		SPT Sampler	3	2
							-60.7	1	
				50	16		SPT Sampler	1	2
-62.2	79.5						-62.2	1	
			SAND, silty, mostly fine-grained sand-sized quartz, some angular sand to gravel-sized shell up to 1/2", few silt, strong reaction with HCl, wet, 10G 4/1 dark greenish gray (SM)	80	17		SPT Sampler	2	3
							-63.7	2	
			At El. -63.7 Ft., low plasticity, trace clay	97	18		SPT Sampler	3	5
							-65.2	3	
			At El. -65.2 Ft., nonplastic, mostly fine-grained sand-sized quartz, some angular sand to gravel-sized shell up to 1/2", few silt, strong reaction with HCl, wet, 5Y 6/1 gray	93	19		SPT Sampler	8	13
							-66.7	8	
				97	20		SPT Sampler	2	17
							-68.2	14	
				97	21		SPT Sampler	17	35
-69.7	87.0						-69.7	16	
			SHELL, mostly angular fine to coarse gravel-sized flat and elongated shell up to 1/2", few silt, strong reaction with HCl, wet, 5Y 8/1 white	97	22		SPT Sampler	14	24
							-71.2	12	
				90	23		SPT Sampler	12	20
							-72.7	10	
				97	24		SPT Sampler	18	56
-74.2	91.5						-74.2	33	
			SHELL, mostly fine-grained sand-sized quartz, some angular fine to coarse gravel-sized shell up to 1/2", few silt, strong reaction with HCl, wet, 5Y 8/1 white	97	25		SPT Sampler	16	47
			At El. -75.7 Ft., weak cementation					18	
							-75.7	29	
				90	26		SPT Sampler	12	29
							-77.2	15	
-77.7	95.0			97	27		SPT Sampler	22	

Boring Designation CP06-L30PP-CB-0001

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 6 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 826,073 Y = 524,279	17.3 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			SHELL, mostly angular coarse gravel-sized flat and elongated shell up to 1-1/2", little fine-grained sand-sized quartz, strong reaction with HCl, wet, weak cementation, 5Y 6/1 gray	97	27		SPT Sampler	25 45	70
							-78.7		
				97	28		SPT Sampler	29 9 9	18
-80.2	97.5						-80.2		
			SAND, silty, mostly fine to coarse-grained sand-sized sandstone up to 1/2", little fine to medium-grained sand-sized shell up to 1/8", strong reaction with HCl, wet, weak cementation, 5Y 7/1 light gray (SM)	90	29		SPT Sampler	10 7 8	15
							-81.7		
				90	30		SPT Sampler	7 11 10	21
							-83.2		
			At El. -83.7 Ft., some fine to medium-grained sand-sized shell up to 1/2"	90	31		SPT Sampler	14 24 23	47
							-84.7		
				90	32		SPT Sampler	15 6 5	11
							-86.2		
				90	33		SPT Sampler	12 12 14	26
-87.7	105.0						-87.7		

NOTES:

1. Soils are field visually classified in accordance with the Unified Soils Classification System.

2. Set 17.5 Ft. of 8" Schedule 40 PVC Pipe Through Center of L-30 Levee To Top of Rock.

3. Boring Drilled/Sampled In Three Phases:
A. Set Surface Casing.
B. 4" Wireline Rock Coring To Base Of Rock.
C. Splitspoon Sampling 30 Ft. Below Base of Rock.

4. Borehole Reamed To 7.5" To Base of Rock. USGS Performed Borehole Logging.

5. 2" Monitoring Well Set @
X = 826074 Y= 524270

Screen From -42.1 to -44.1 Ft.

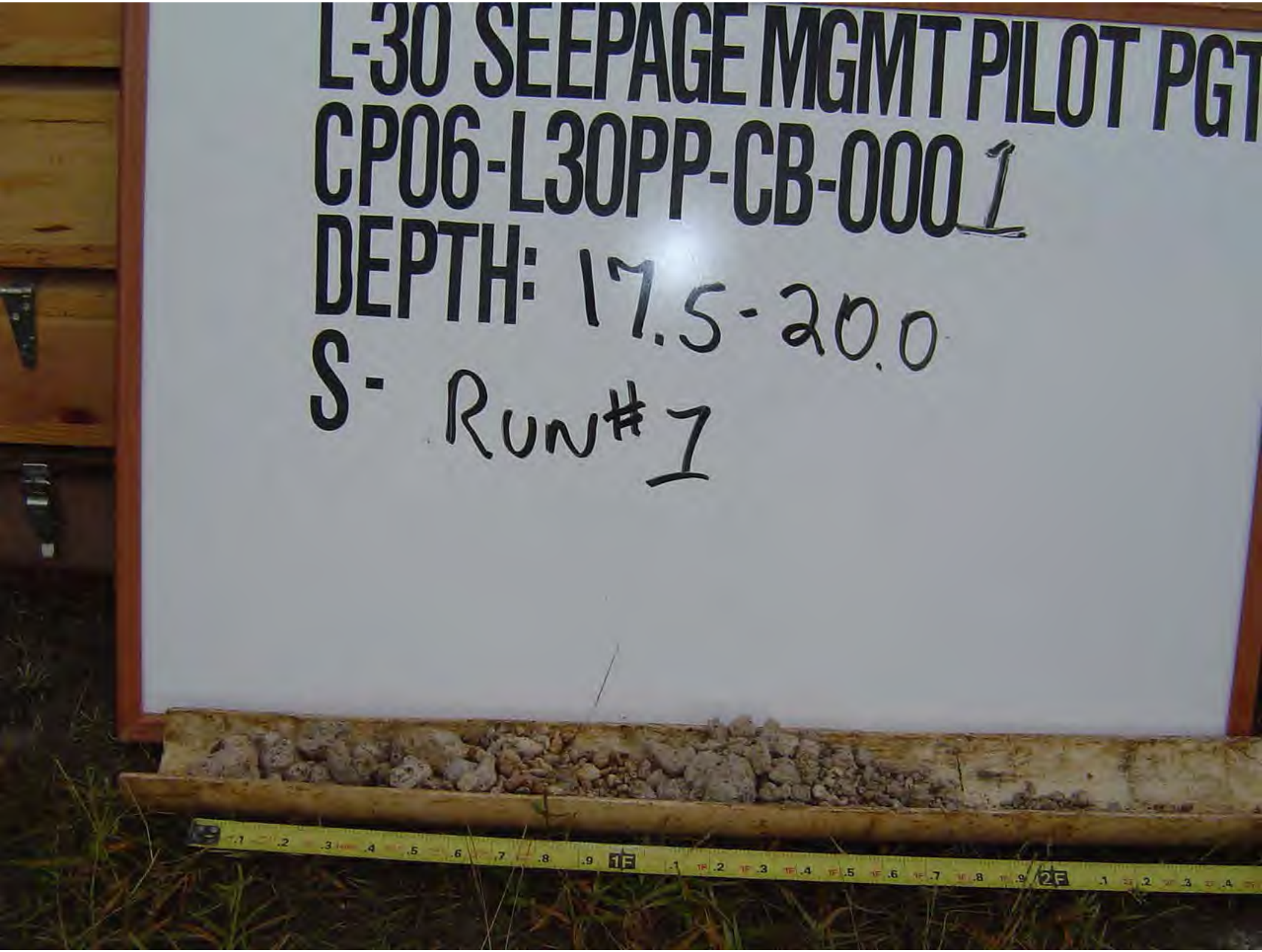
6. Cored to 80 Ft. To Confirm Out of Rock.

7. Boring sealed with available sediment.

140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

Abbreviations:
WOH = Weight of Hammer.
DT = Drill Time.
HP = Hydraulic Pressure.
DFR = Drill Fluid Return.

95
100
105
110
115


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 17.5-20.0
S- Run#1


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 20.0-25.0'
S- RUN#2


L-30 SEEPAGE MGT PILOT PGT
CP06-L30PP-CB-000
DEPTH: 250-300'
S- RUN# 3


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000
DEPTH: 30.0-35.0'
S- RUN#4


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000
DEPTH: 35.0-40.0
S- RUN# 5

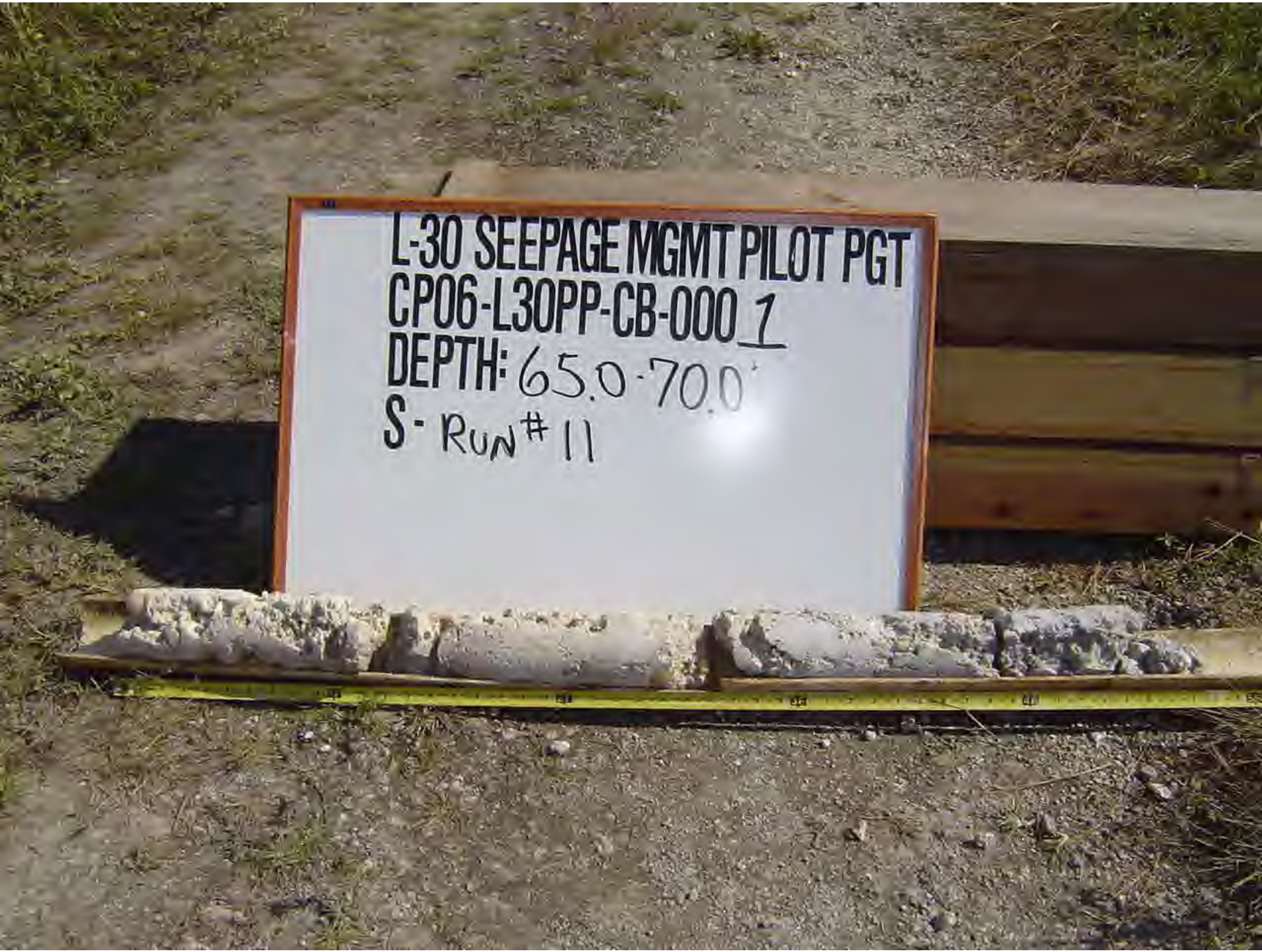

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000
DEPTH: 40.0-45.0'
S- RUN#6


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 45.0-50.0'
S- Run#7


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 50.0-55.0'
S- Run# 8


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000
DEPTH: 55.0-60.0'
S- RUN# 9


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000_1
DEPTH: 60.0-65.0'
S- RUN#10


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000_1
DEPTH: 65.0-70.0'
S- RUN# 11


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000_1
DEPTH: 70.0-75.0'
S- RUN#12


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 75.0-76.5'
S-14


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 76.5-78.0'
S-15


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 78.0-79.5'
S-16


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 79.5-81.0'
S-17

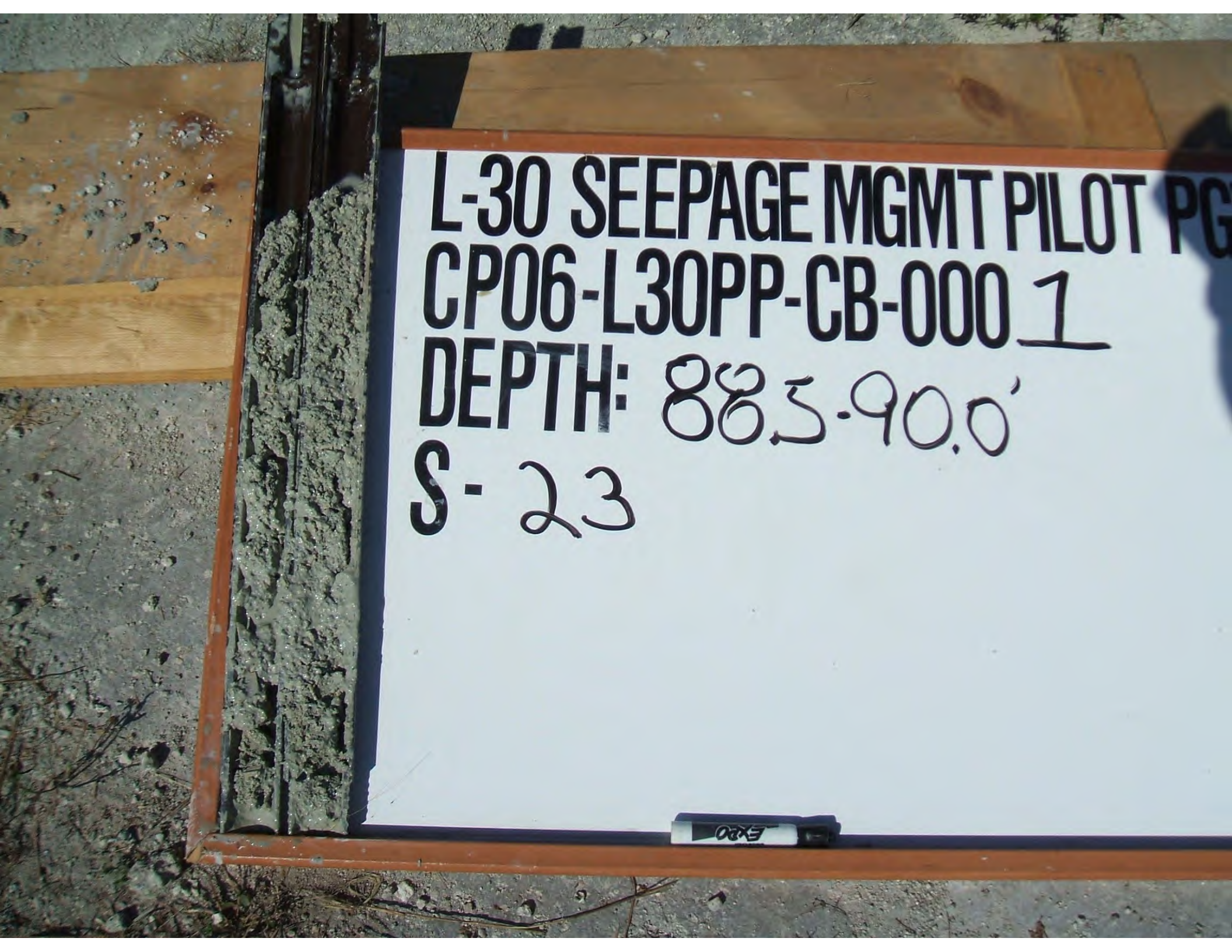

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 81.0-82.5'
S- 18


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 82.5'-84.0'
S-19


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 84.0-85.5'
S-20


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 87.0-88.5
S-21


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 87.0-88.5'
S-22


L-30 SEEPAGE MGMT PILOT PG
CP06-L30PP-CB-0001
DEPTH: 88.5-90.0'
S-23

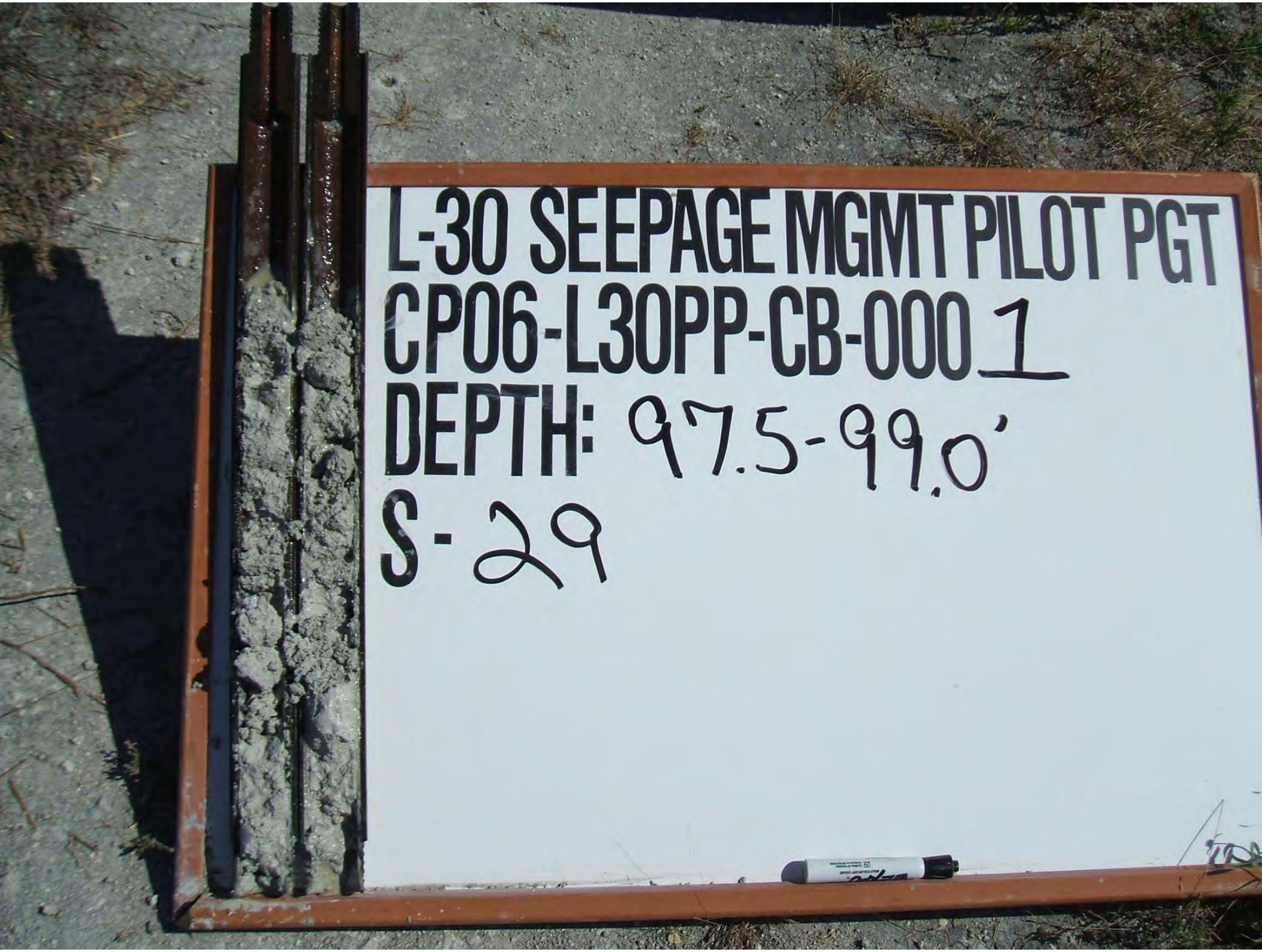

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 90.0-91.5'
S-24

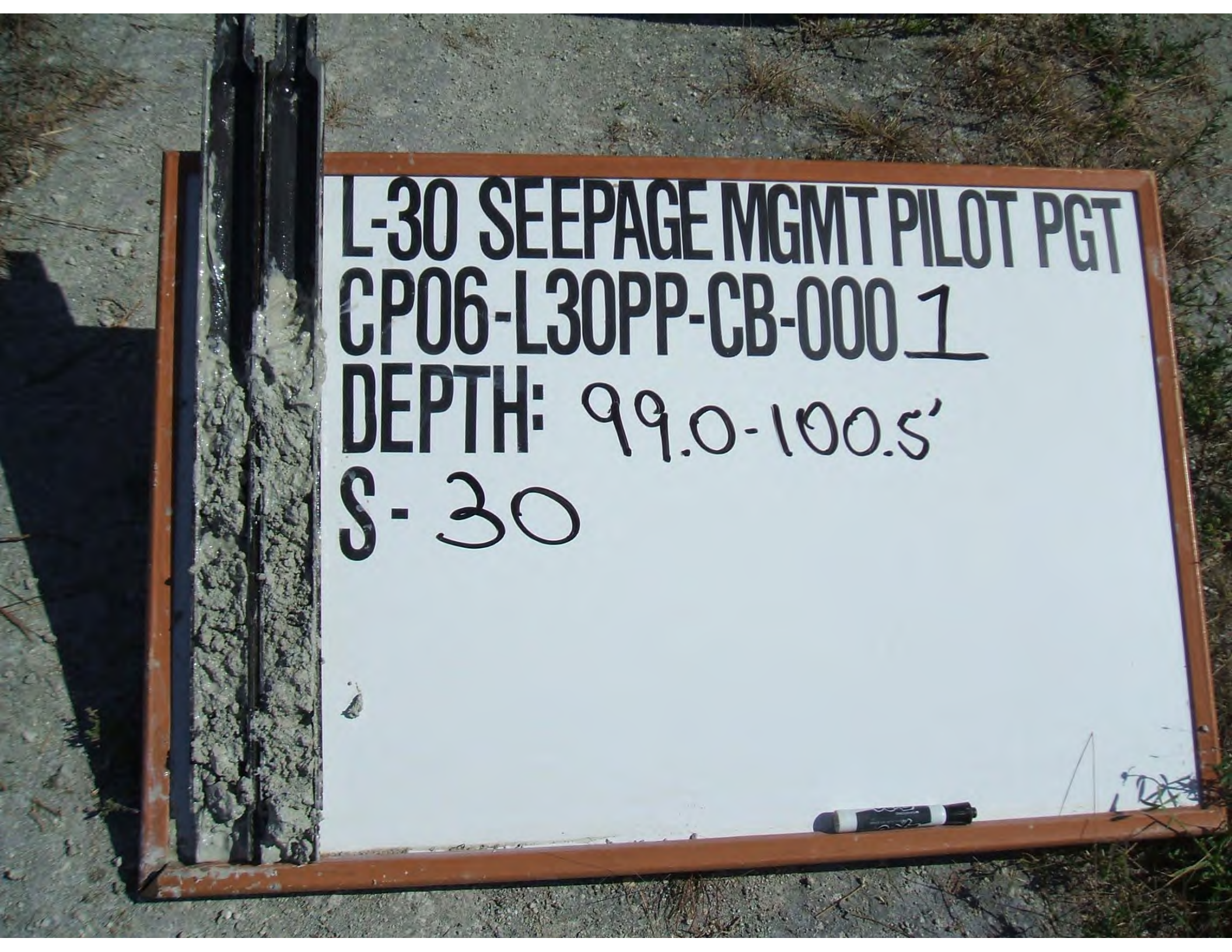

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 91.5-93.0'
S-25


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 93.0-94.5'
S-26


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 94.5-96.0'
S-27

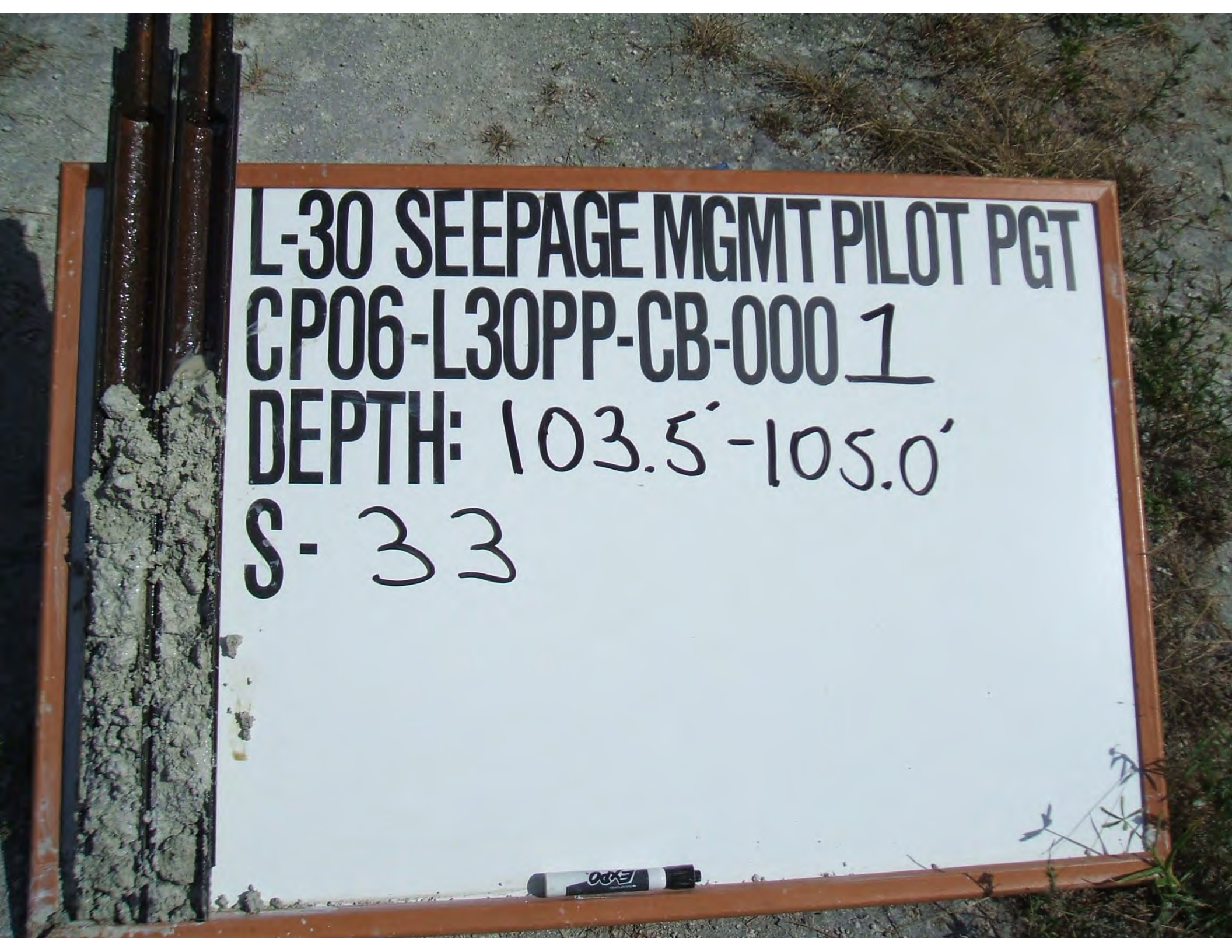

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 96.0-97.5
S-28


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 97.5-99.0'
S-29


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 99.0-100.5'
S-30


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 100.5-102.0'
S-31


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 102.0-103.5'
S-32


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0001
DEPTH: 103.5'-105.0'
S-33

SOILS TEST CORE BORING NUMBER "CP06-L30PP-CB-0002"

Miami-Dade County, Florida

DRILLING LOG

DIVISION South Atlantic	**INSTALLATION** Jacksonville District	**SHEET** 1 **OF** 7 **SHEETS**	
1. PROJECT L-30 Seepage Management Pilot Project; Top Of Levee L-30 (Center of Roadway)	**9. SIZE AND TYPE OF BIT** See Remarks		
	10. COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	**HORIZONTAL** NAD83	**VERTICAL** NAVD88
2. BORING DESIGNATION CP06-L30PP-CB-0002	**LOCATION COORDINATES** X = 823,753 Y = 522,044	**11. MANUFACTURER'S DESIGNATION OF DRILL** CME 55 Truckrig	☐ AUTO HAMMER ☒ MANUAL HAMMER
3. DRILLING AGENCY Challenge Engineering & Testing, Inc.	**CONTRACTOR FILE NO.** 2006D30	**12. TOTAL SAMPLES**	**DISTURBED** 33 / **UNDISTURBED (UD)** 0
4. NAME OF DRILLER Adam Benson		**13. TOTAL NUMBER CORE BOXES** 4	
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED	**DEG. FROM VERTICAL**	**BEARING**	**14. ELEVATION GROUND WATER** 5.0 Ft.
		15. DATE BORING	**STARTED** 10-06-06 / **COMPLETED** 10-17-06
6. THICKNESS OF OVERBURDEN N/A		**16. ELEVATION TOP OF BORING** 17.5 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		**17. TOTAL RECOVERY FOR BORING** 65 %	
8. TOTAL DEPTH OF BORING 109.0 Ft.		**18. SIGNATURE AND TITLE OF INSPECTOR** Bob Momberger, Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
17.5	0.0						17.5		
			L-30 Levee Fill Material				Advanced Boring w/ tricone roller bit		

0 5 10 15

(Continued)

Boring Designation CP06-L30PP-CB-0002

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 7 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 823,753 Y = 522,044	17.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring w/ tricone roller bit		
0.2	17.3						0.2		
			LIMESTONE, oolitic, sparsely fossiliferous, soft, moderately weathered, fine-grained, thin bedding, vuggy, Ft. Thompson Formation, 2.5Y 8/2 pale yellow	81	1	RQD 20	4 x 5-1/2" Diamond Impregnated Bit DT = 1 mins HP = 250 psi DFR = 50 %		
-2.5	20.0						-2.5		
		Moderately Weathered	LIMESTONE, hard, moderately weathered, fine-grained, thick bedding, pitted, 5Y 8/1 white						
			At El. -4.0 Ft., 5Y 7/3 pale yellow	100	2	RQD 85	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 25 %		
-5.5	23.0		LIMESTONE, fossiliferous, moderately hard, slightly weathered, aphanitic, thick bedding, vuggy, 5Y 8/2 pale yellow		BOX 1				
							-7.5		
		Slightly Weathered	At El. -9.5 Ft., thin bedding, 5Y 8/1 white	60	3	RQD 10	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
-12.5	30.0						-12.5		
			SAND, silty, soft, mostly subangular fine-grained sand-sized carbonate, strong reaction with HCl, wet, 2.5Y 8/2 pale yellow (SM)						
-14.5	32.0								
		Moderately Weathered	LIMESTONE, fossiliferous, moderately hard, moderately weathered, fine-grained, thin bedding, vuggy, 5Y 8/1 white	60	BOX 2	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
			At El. -17.0 Ft., 5Y 6/4 pale olive						
							-17.5		

Boring Designation CP06-L30PP-CB-0002

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 3 OF 7 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 823,753 Y = 522,044	17.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
	Moderately Weathered		From El. -20.5 to -31.5 Ft., unweathered, aphanitic, thin bedding, pitted, 5Y 8/1 white	60	5	RQD 25	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
							-22.5		
				60	BOX 2	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 5 mins HP = 250 psi DFR = 0 %		
							-27.5		
	Unweathered			66	7	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 5 mins HP = 250 psi DFR = 0 %		
			From El. -31.5 to -37.5 Ft., soft, unweathered, aphanitic, thin bedding, pitted, clay filled pits				-32.5		
	Unweathered			60	BOX 3	RQD 25	4 x 5-1/2" Diamond Impregnated Bit DT = 6 mins HP = 250 psi DFR = 0 %		
							-37.5		

35 40 45 50 55

Boring Designation CP06-L30PP-CB-0002

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 4 OF 7 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 823,753 Y = 522,044	17.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
		Mod. Weathered	From El. -37.5 to -39.5 Ft., moderately hard, moderately weathered, aphanitic, thin bedding, vuggy, 5Y 7/2 light gray						
		Unweathered	From El. -39.5 to -43.5 Ft., soft, unweathered, aphanitic, thin bedding, pitted, clay filled pits, 5Y 8/1 white	25	9	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
							-42.5		
		Moderately Weathered	From El. -43.5 to -46.0 Ft., moderately hard, moderately weathered, aphanitic, thin bedding, vuggy, sand filled vugs, 5Y 7/3 pale yellow	20	BOX 10 3	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 6 mins HP = 250 psi DFR = 0 %		
			From El. -46.0 to -51.5 Ft., moderately weathered, aphanitic, thin bedding, pitted, clay filled pits, 10YR 7/2 light gray				-47.5		
				80	11	RQD 8	4 x 5-1/2" Diamond Impregnated Bit DT = 6 mins HP = 250 psi DFR = 0 %		
		Unweathered	From El. -51.5 to -55.5 Ft., unweathered, aphanitic, medium bedding, vuggy, sand filled vugs, 10YR 8/2 very pale brown				-52.5		
				90	BOX 12 4	RQD 60	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
		Mod. Weathered	From El. -55.5 to -57.5 Ft., moderately weathered, fine-grained, thick bedding, pitted, sand filled pits, 2.5Y 6/1 gray						
-57.5	75.0						-57.5		

55 60 65 70 75

Boring Designation CP06-L30PP-CB-0002

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 5 OF 7 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 823,753 Y = 522,044	17.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
		Slighly Weathered	LIMESTONE, soft, slightly weathered, aphanitic, 5Y 7/3 pale yellow	0	BOX 13 4	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 2 mins HP = 250 psi DFR = 0 %		
-61.5	79.0						-61.5		
-62.5	80.0	Wea.	LIMESTONE, fossiliferous, soft, slightly weathered, aphanitic, pitted, sand filled pits, 5Y 7/3 pale yellow	20	14		SPT Sampler	WOR 0 0	0
			SHELL, mostly angular coarse-grained sand-sized shell up to 1/2", little clay, strong reaction with HCl, wet, Pinecrest Sand Formation, 2.5Y 7/1 light gray				-63.0		
				40	15		SPT Sampler	7 12 11	23
			At El. -64.5 Ft., some coarse gravel-sized limestone up to 1"				-64.5		
				97	16		SPT Sampler	7 14 14	28
							-66.0		
				73	17		SPT Sampler	8 17 16	33
							-67.5		
-68.5	86.0			100	18		SPT Sampler	7 8 8	16
-70.0	87.5		SAND, clayey, nonplastic, soft, mostly fine-grained sand-sized carbonate, little clay, strong reaction with HCl, wet, 2.5Y 7/1 light gray (SC)				-69.0		
			SHELL, mostly angular coarse-grained sand-sized shell up to 1/4", some coarse-grained sand-sized limestone up to 1/2", little clay, strong reaction with HCl, wet, 2.5Y 6/1 gray	50	19		SPT Sampler	12 14 15	29
							-70.5		
				77	20		SPT Sampler	12 12 14	26
							-72.0		
				90	21		SPT Sampler	14 8 10	18
							-73.5		
-74.5	92.0		At El. -73.5 Ft., nonplastic, mostly angular medium-grained sand-sized shell up to 1/4", little fine to medium-grained sand-sized carbonate, strong reaction with HCl, wet, 2.5Y 6/1 gray	90	22		SPT Sampler	10 8 7	15
							-75.0		
			CLAY, lean, medium plasticity, soft, mostly clay, some shell up to 1/4", little fine-grained sand-sized carbonate, strong reaction with HCl, wet, 2.5Y 5/1 gray (CL)	90	23		SPT Sampler	5 7 7	14
							-76.5		
			At El. -76.5 Ft., some fine-grained sand-sized quartz, little coarse-grained sand-sized shell, strong reaction with HCl,	90	24		SPT Sampler	6 5	

Boring Designation CP06-L30PP-CB-0002

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 6 OF 7 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 823,753 Y = 522,044	17.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			wet, 10Y 6/1 greenish gray	90	24		-78.0 SPT Sampler	5	10
-78.5	96.0							15	
			SAND, silty, very soft, mostly fine-grained sand-sized quartz, little silt, little coarse-grained sand-sized shell up to 1/4", strong reaction with HCl, wet, 10Y 7/1 light greenish gray (SM)	67	25		SPT Sampler	15	23
							-79.5	8	
				47	26		SPT Sampler	7	
								14	28
-81.0	98.5						-81.0	14	
			SHELL, mostly angular fine to coarse gravel-sized shell up to 3/4", little fine-grained sand-sized quartz, little sand to gravel-sized limestone up to 1/2", few silt, strong reaction with HCl, wet, 10Y 7/1 light greenish gray	90	27		SPT Sampler	7	
								14	35
			At El. -82.5 Ft., few fine-grained sand-sized quartz				-82.5	21	
				90	28		SPT Sampler	22	
								23	44
							-84.0	21	
				90	29		SPT Sampler	12	
								11	20
			At El. -85.0 Ft., some fine to medium-grained sand-sized quartz, trace sand to gravel-sized shell up to 3/4"				-85.5	9	
				90	30		SPT Sampler	5	
								10	20
-87.5	105.0						-87.0	10	
			SAND, silty, some fine-grained sand-sized quartz, little fine-grained sand-sized carbonate, little sand to gravel-sized shell up to 1/2", strong reaction with HCl, wet, 10Y 6/1 greenish gray (SM)	90	31		SPT Sampler	17	
								23	65
			At El. -88.5 Ft., few coarse-grained sand-sized limestone up to 1/4"				-88.5	42	
				90	32		SPT Sampler	27	
								37	74
							-90.0	37	
				97	33		SPT Sampler	14	
								34	71
-91.4	108.9						-91.5	37	
-91.5	109.0		LIMESTONE, fossiliferous, moderately hard, coarse-grained, pitted, clay filled pits, 10Y 6/1 greenish gray				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).		

NOTES:

1. Soils are field visually classified in accordance with the Unified Soils Classification System.

2. Set 17.5 Ft. of 8" Schedule 40 PVC Pipe Through Center of L-30 Levee To Top of Rock.

3. Boring Drilled/Sampled In Three Phases:
A. Set Surface Casing.
B. 4" Wireline Rock Coring To Base Of Rock.
C. Splitspoon Sampling 30 Ft. Below Base of Rock.

Abbreviations:
WOR = Weight of Rods.
DT = Drill Time.
HP = Hydraulic Pressure.
DFR = Drill Fluid Return.

95
100
105
110
115

Boring Designation CP06-L30PP-CB-0002

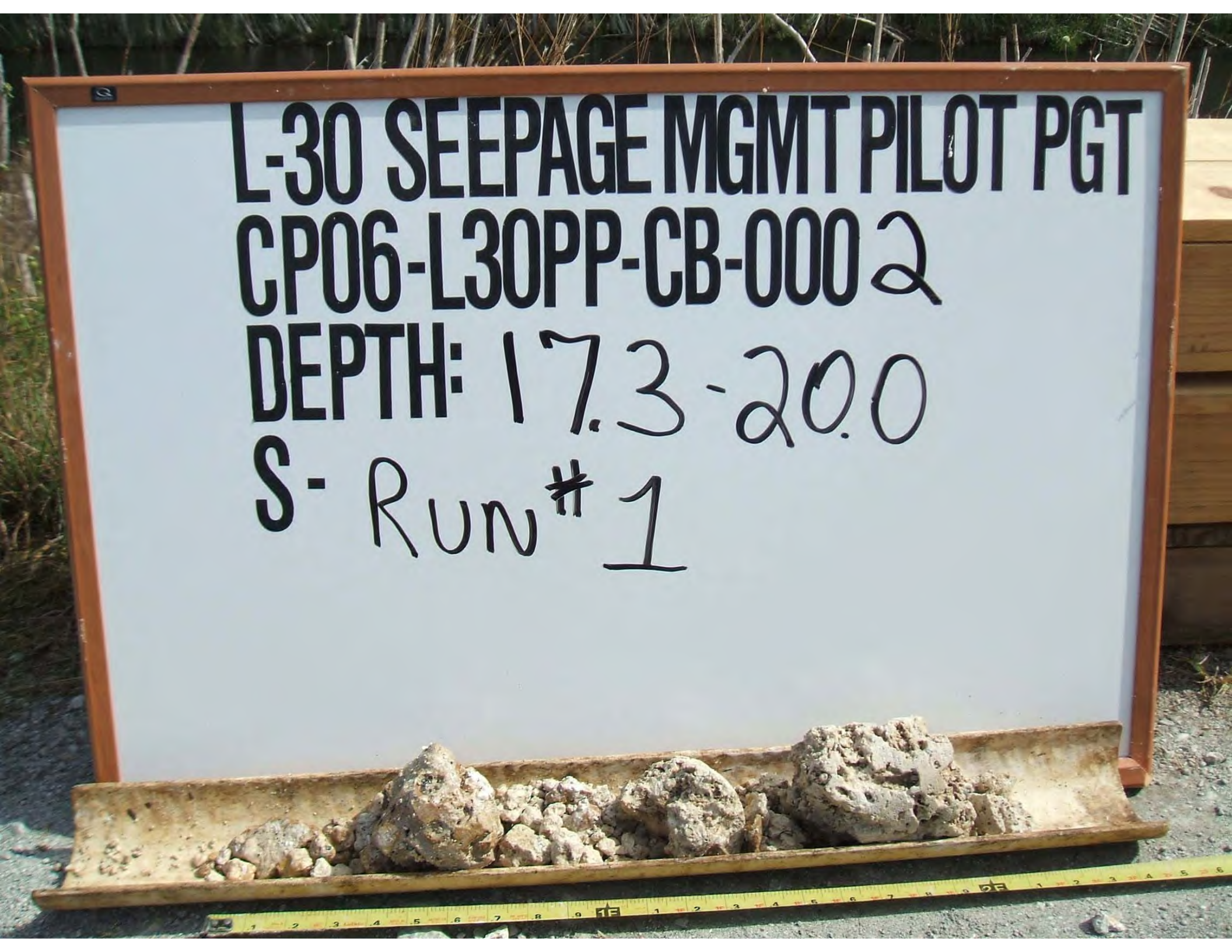
DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 7 OF 7 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 823,753 Y = 522,044	17.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			4. Borehole Reamed To 7.5" To Base of Rock. USGS Performed Borehole Logging. 5. 2" Monitoring Well Set @ X = 823754 Y= 522036 Screen From -40.7 to -42.7 Ft. 6. Cored to 80 Ft. To Confirm Out of Rock 7. Boring sealed with available sediment.						

115
120
125
130
135


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 17.3-20.0
S- Run#1


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 20.0-25.0'
S- Run#2


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 25.0-30.0'
S- Run #3


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 30.0-35.0'
S- Run# 4

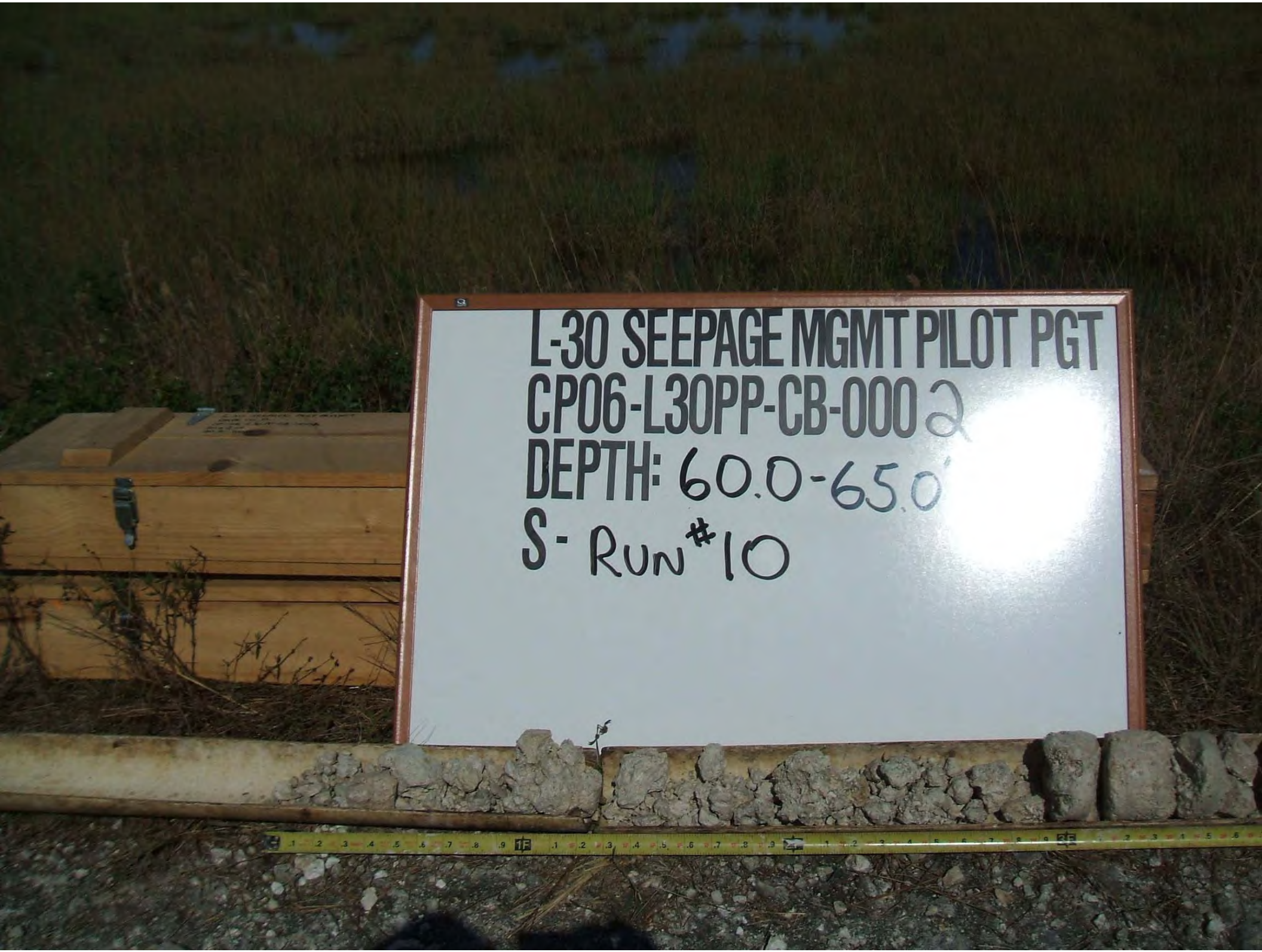

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 35.0 - 40.0
S- Run #5


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 40.0-45.0'
S- RUN#6


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 45.0-50.0'
S- RUN#7


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 50.0-55.0'
S- RUN # 8


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 55.0-60.0'
S- RUN # 9

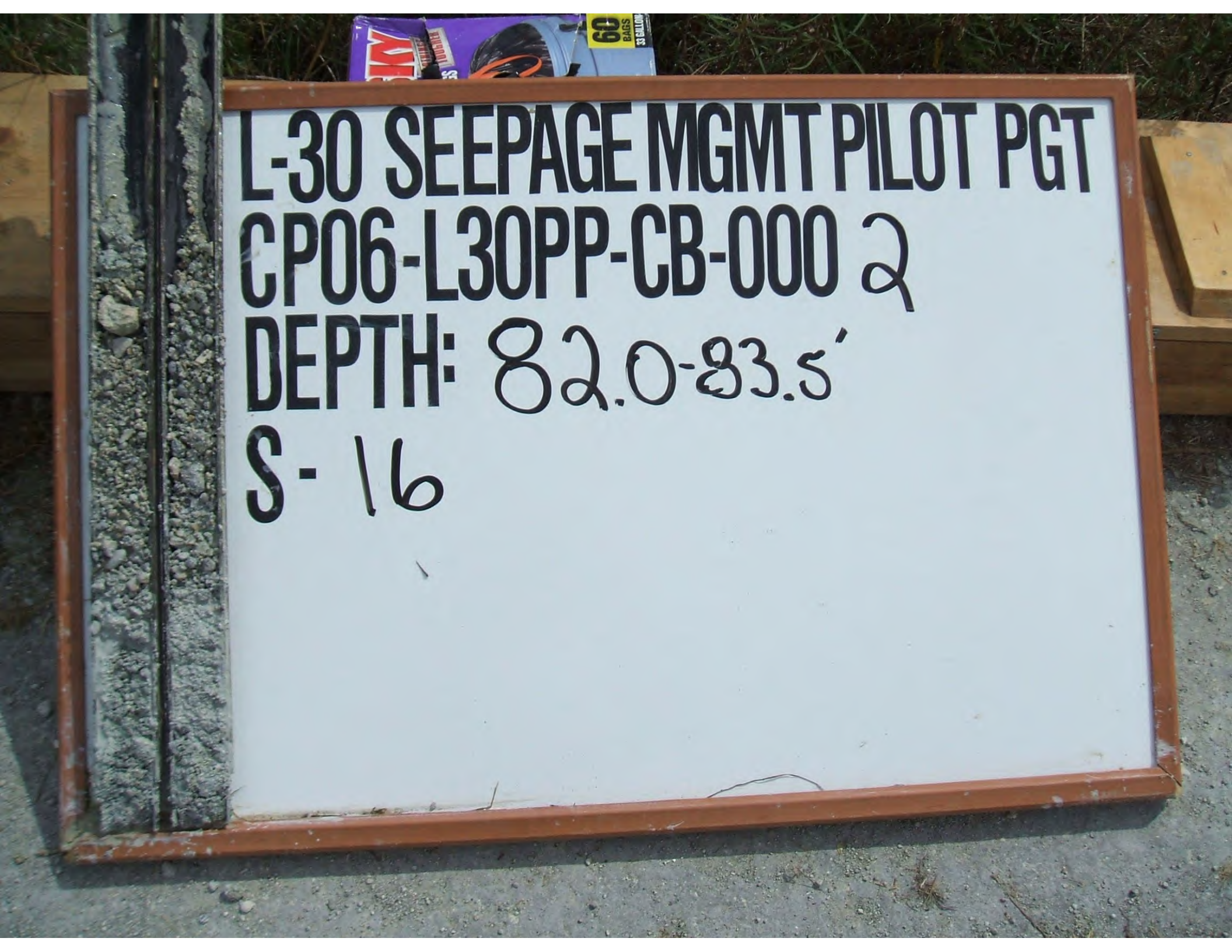

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 60.0-65.0'
S- RUN #10


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 65-70.0'
S- RUN# 11


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 70.0-75.0'
S- RUN#12


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 79.0-80.5'
S-14
60 BAGS
33 GALLON


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 80.5-82.0'
S-15
60 BAGS
33 GALLON


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 82.0-83.5'
S-16

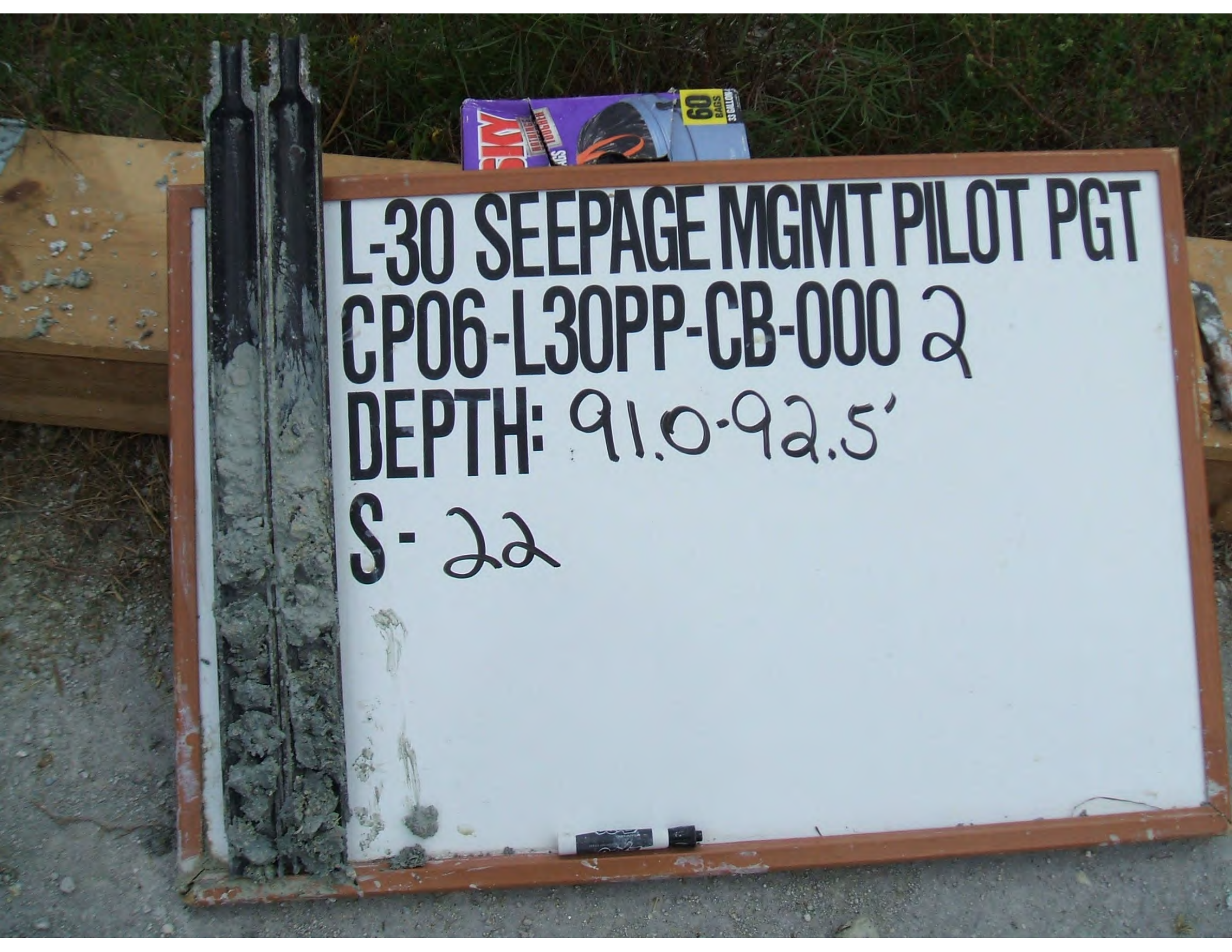

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 83.5-85.0'
S-17
60
BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 85.0-86.5'
S-18
60 BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 86.5-88.0'
S-19
60 BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 88.0-89.5
S-20
60 BAGS
33 GALLON

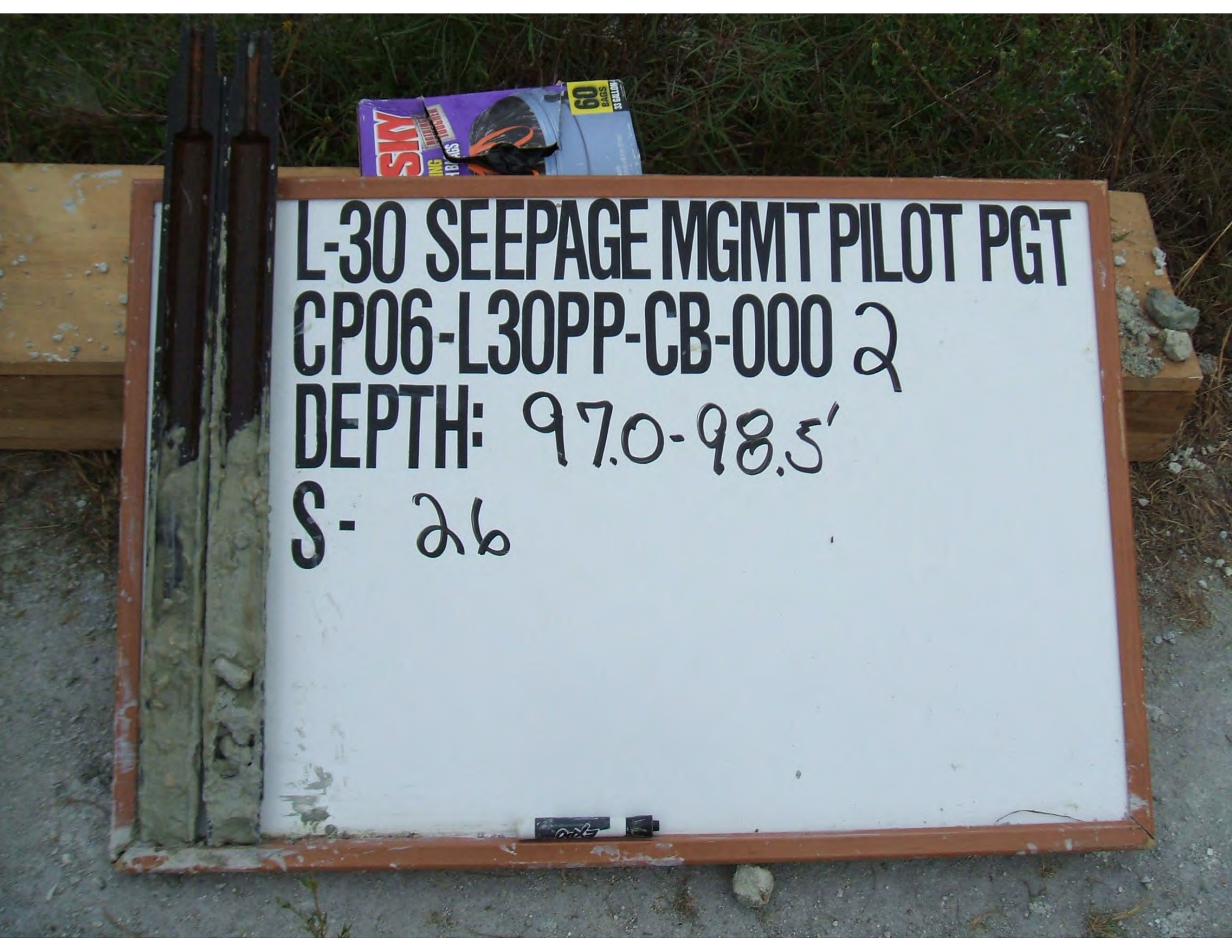

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 89.5-91.0'
S-21
60 BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000 2
DEPTH: 91.0-92.5'
S-22
60 BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 92.5-94.0'
S-23
60
BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 94.0-95.5'
S- 24
60
EXPO


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 95.5-97.0
S- 25
60
BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 97.0-98.5'
S- 26
60
BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 98.5-100.0'
S-27
60
EXPO


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 101.5-103.0'
S-28
60
BAGS
33 GALLON


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 101.5-103.0'
S-29
60
USKY


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 103.0-104.5'
S-30
USKY
STRING
TRASH BAGS
60
BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 104.5-106.0'
S-31
60 BAGS
33 GALLON


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 106.0-107.5'
S-32
60
BAGS


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0002
DEPTH: 107.5-109.0'
S-33
60
BAGS
33 GALLON

SOILS TEST CORE BORING NUMBER "CP06-L30PP-CB-0003"

Miami-Dade County, Florida

DRILLING LOG

DIVISION South Atlantic	**INSTALLATION** Jacksonville District	**SHEET** 1 **OF** 6 **SHEETS**	
1. PROJECT L-30 Seepage Management Pilot Project; Top Of Levee L-30 (Center of Roadway)	**9. SIZE AND TYPE OF BIT** See Remarks		
	10. COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	**HORIZONTAL** NAD83	**VERTICAL** NAVD88
2. BORING DESIGNATION CP06-L30PP-CB-0003	**LOCATION COORDINATES** X = 821,358 Y = 519,743	**11. MANUFACTURER'S DESIGNATION OF DRILL** CME 55 Truckrig	☐ AUTO HAMMER ☒ MANUAL HAMMER
3. DRILLING AGENCY Challenge Engineering & Testing, Inc.	**CONTRACTOR FILE NO.** 2006D30	**12. TOTAL SAMPLES**	**DISTURBED** 33 / **UNDISTURBED (UD)** 0
4. NAME OF DRILLER Adam Benson		**13. TOTAL NUMBER CORE BOXES** 5	
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED	**DEG. FROM VERTICAL**	**BEARING**	**14. ELEVATION GROUND WATER** 5.0 Ft.
		15. DATE BORING	**STARTED** 10-07-06 / **COMPLETED** 10-18-06
6. THICKNESS OF OVERBURDEN N/A		**16. ELEVATION TOP OF BORING** 17.2 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		**17. TOTAL RECOVERY FOR BORING** 73 %	
8. TOTAL DEPTH OF BORING 105.0 Ft.		**18. SIGNATURE AND TITLE OF INSPECTOR** Bob Momberger, Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
17.2	0.0						17.2		
			L-30 Levee Fill Material				Advanced Boring w/ tricone roller bit		

0 5 10 15

(Continued)

Boring Designation CP06-L30PP-CB-0003

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 821,358 Y = 519,743	17.2 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring w/ tricone roller bit		
-0.3	17.5						-0.3		
			LIMESTONE, oolitic, sparsely fossiliferous, moderately hard, slightly weathered, fine-grained, thick bedding, vuggy, peat filled vugs, Ft. Thompson Formation, 2.5Y 8/2 pale yellow	100	1	RQD 50	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 50 %		
							-2.8		
			At El. -2.8 Ft., vuggy, quartz filled vugs						
			From El. -4.3 to -12.8 Ft., aphanitic, thick bedding, pitted, sand filled pits, 2.5Y 7/2 light gray	100	2 BOX 1	RQD 30	4 x 5-1/2" Diamond Impregnated Bit DT = 6 mins HP = 250 psi DFR = 25 %		
			At El. -6.8 Ft., pitted, clay filled pits				-7.8		
				70	3	RQD 45	4 x 5-1/2" Diamond Impregnated Bit DT = 5 mins HP = 250 psi DFR = 0 %		
-12.8	30.0						-12.8		
			LIMESTONE, fossiliferous, very soft, slightly weathered, aphanitic, thin bedding, vuggy, clay filled vugs, 2.5Y 8/1 white	6	BOX 2 4	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
							-17.8		

Slighlty Weathered

15 20 25 30 35

SAJ FORM 1836-A
JUN 02

Boring Designation CP06-L30PP-CB-0003

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 3 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 821,358 Y = 519,743	17.2 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			At El. -17.8 Ft., sparsely fossiliferous, moderately hard, slightly weathered, aphanitic, thick bedding, pitted	90	5	RQD 50	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
			At El. -21.8 Ft., fossiliferous				-22.8		
				96	BOX 2 6	RQD 20	4 x 5-1/2" Diamond Impregnated Bit DT = 2 mins HP = 250 psi DFR = 0 %		
			At El. -25.8 Ft., soft, vuggy, clay filled vugs				-27.8		
			At El. -27.3 Ft., moderately hard, unweathered, aphanitic, medium bedding, vuggy, sand filled vugs, 5Y 8/1 white	70	7	RQD 20	4 x 5-1/2" Diamond Impregnated Bit DT = 3 mins HP = 250 psi DFR = 0 %		
							-32.8		
				90	BOX 3 8	RQD 25	4 x 5-1/2" Diamond Impregnated Bit DT = 4 mins HP = 250 psi DFR = 0 %		
							-37.8		

Unweathered

35 40 45 50 55

Boring Designation CP06-L30PP-CB-0003

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 4 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 821,358 Y = 519,743	17.2 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
		Slightly Weathered	At El. -37.8 Ft., slightly weathered, pitted, 2.5Y 8/1 white	70	9 BOX 3	RQD 20	4 x 5-1/2" Diamond Impregnated Bit DT = 2 mins HP = 250 psi DFR = 0 %		
							-42.8		
-44.8	62.0	Unweathered	LIMESTONE, hard, unweathered, pitted, 2.5Y 6/1 gray	80	10	RQD 20	4 x 5-1/2" Diamond Impregnated Bit DT = 7 mins HP = 250 psi DFR = 0 %		
							-47.8		
			At El. -47.8 Ft., moderately weathered, thin bedding, vuggy, clay filled vugs						
-49.8	67.0	Moderately Weathered	LIMESTONE, soft, clay filled vugs	40	11 BOX 4	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 2 mins HP = 250 psi DFR = 0 %		
							-52.8		
-54.8	72.0		SHELL, mostly angular sand to gravel-sized shell up to 1/2", few fine-grained sand-sized carbonate, trace limestone up to 1/8", strong reaction with HCl, wet, 5Y 7/1 light gray	20	12	RQD 0	4 x 5-1/2" Diamond Impregnated Bit DT = 1 mins HP = 250 psi DFR = 0 %		
			At El. -57.1 Ft., little fine-grained sand-sized carbonate, Pinecrest Sand Formation						
							-57.8		

55 60 65 70 75

Boring Designation CP06-L30PP-CB-0003

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 5 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 821,358 Y = 519,743	17.2 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				0	13	RQD 0	4 x 5-1/2" Diamond Impregnated Bit		
				67	14		SPT Sampler	4 2 2	4
							-59.3		
				73	15		SPT Sampler	3 2 4	6
							-60.8		
				73	16		SPT Sampler	3 2 3	5
			At El. -62.3 Ft., mostly angular fine to coarse gravel-sized shell up to 1/2", few silt, few clay, strong reaction with HCl, wet, 10Y 6/1 greenish gray				-62.3		
				47	17		SPT Sampler	7 6 6	12
							-63.8		
				97	18		SPT Sampler	5 4 7	11
-65.3	82.5						-65.3		
			SAND, silty, mostly fine-grained sand-sized carbonate, little angular sand to gravel-sized shell up to 1/2", few sandstone, strong reaction with HCl, wet, moderate cementation, N 6/ gray (SM)	100	19		-65.6 SPT Sampler	50/0.3'	
-66.8	84.0						Advanced Boring -66.8		
			SHELL, low plasticity, mostly angular sand to gravel-sized shell up to 1/2", little clay, few silt, strong reaction with HCl, wet, 10Y 6/1 greenish gray	90	20		SPT Sampler	14 14 17	31
							-68.3		
				53	21		SPT Sampler	9 19 21	40
			At El. -69.8 Ft., mostly angular fine gravel-sized shell up to 3/4", few silt, strong reaction with HCl, wet, 10Y 6/1 greenish gray				-69.8		
				80	22		SPT Sampler	19 22 26	48
			At El. -71.3 Ft., little silt				-71.3		
				90	23		SPT Sampler	22 21 17	38
-72.8	90.0						-72.8		
			SAND, silty, mostly medium-grained sand-sized quartz, some angular medium-grained sand-sized shell up to 1/4", strong reaction with HCl, wet, N 6/ gray (SM)	97	24		SPT Sampler	11 12 15	27
							-74.3		
				97	25		SPT Sampler	14 14 14	28
							-75.8		
				97	26		SPT Sampler	9 6 7	13
							-77.3		
				67	27		SPT Sampler	8	

Boring Designation CP06-L30PP-CB-0003

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 6 OF 6 SHEETS
	Jacksonville District	

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
L-30 Seepage Management Pilot Project	State Plane, FLE (U.S. Ft.)	NAD83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 821,358 Y = 519,743	17.2 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			At El. -77.8 Ft., some angular sand to gravel-sized shell up to 1/2", trace silt, strong reaction with HCl, wet, N 6/ gray	67	27		SPT Sampler	5 6	11
			At El. -78.8 Ft., some angular sand to gravel-sized shell up to 1"	97	28		-78.8 SPT Sampler	2 3 7	10
				97	29		-80.3 SPT Sampler	29 25 23	48
			At El. -81.8 Ft., little angular medium-grained sand-sized shell up to 1/4", strong reaction with HCl, wet, N 6/ gray	97	30		-81.8 SPT Sampler	12 20 27	47
			At El. -83.3 Ft., some angular sand to gravel-sized shell up to 1"	93	31		-83.3 SPT Sampler	10 26 28	54
			At El. -84.8 Ft., some angular sand to gravel-sized shell up to 1-1/2"	70	32		-84.8 SPT Sampler	15 26 13	39
			At El. -86.3 Ft., little angular sand to gravel-sized shell up to 1/2", weak cementation, 10Y 7/1 light greenish gray	73	33		-86.3 SPT Sampler	6 7 8	15
-87.8	105.0						-87.8		

NOTES:

1. Soils are field visually classified in accordance with the Unified Soils Classification System.

2. Set 17.5 Ft. of 8" Schedule 40 PVC Pipe Through Center of L-30 Levee To Top of Rock.

3. Boring Drilled/Sampled In Three Phases:
A. Set Surface Casing.
B. 4" Wireline Rock Coring To Base Of Rock.
C. Splitspoon Sampling 30 Ft. Below Base of Rock.

4. Borehole Reamed To 7.5" To Base of Rock. USGS Performed Borehole Logging.

5. 2" Monitoring Well Set @
X = 821356 Y= 519734

Screen From -41.8 to -43.8 Ft.

6. Cored to 80 Ft. To Confirm Out of Rock

7. Boring sealed with available sediment.

140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

Abbreviations:
DT = Drill Time.
HP = Hydraulic Pressure.
DFR = Drill Fluid Return.

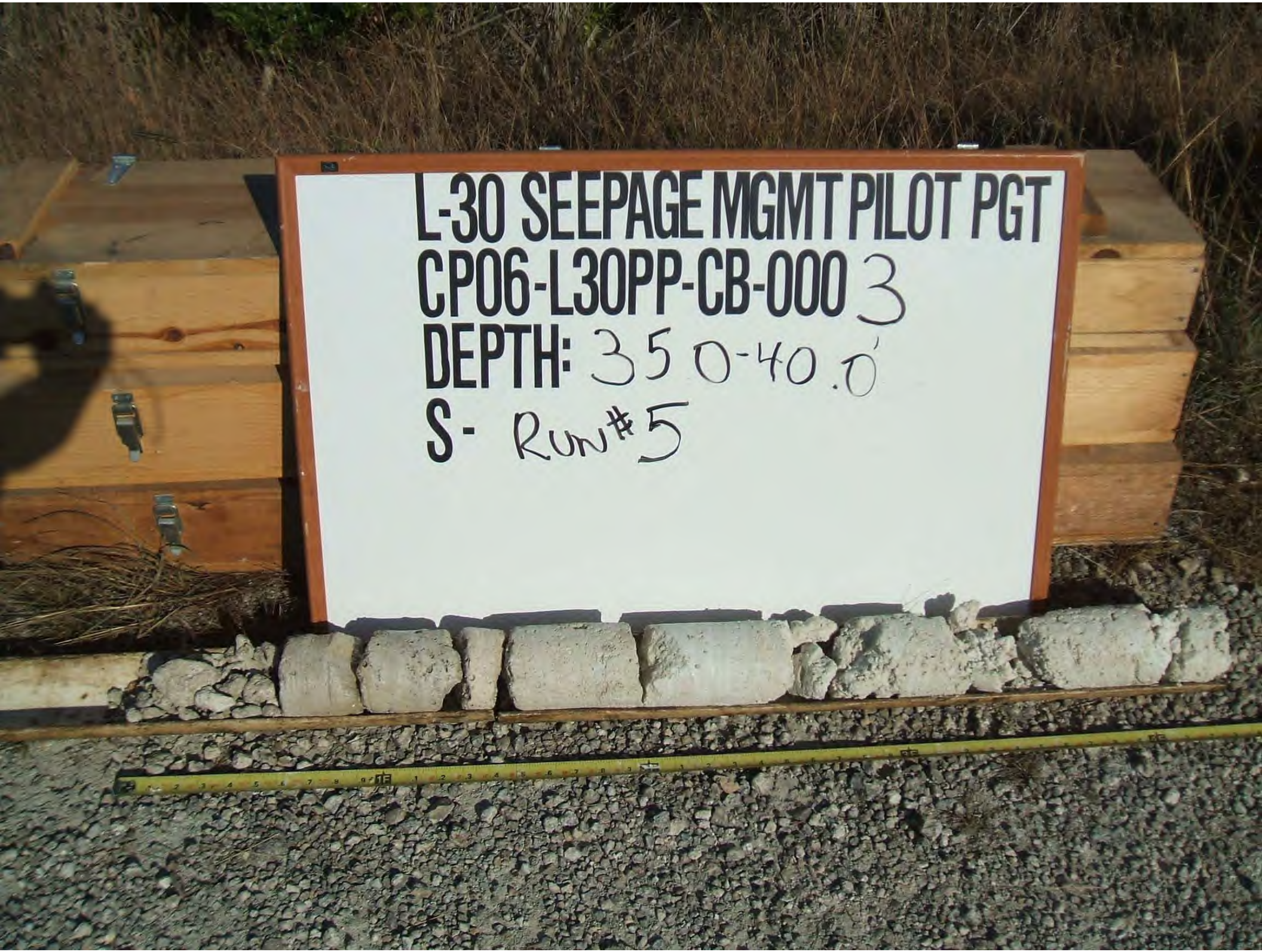
95
100
105
110
115


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 17.5-20.0'
S- Run#1


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 20.0-25.0'
S- Run# 2


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 25.0 - 30.0
S- Run#3


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 30.0-35.0'
S- Run#4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CP06-L30PP-CB-0003
DEPTH: 350-400'
S- RUN#5


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 40.0-45.0'
S- Run #6

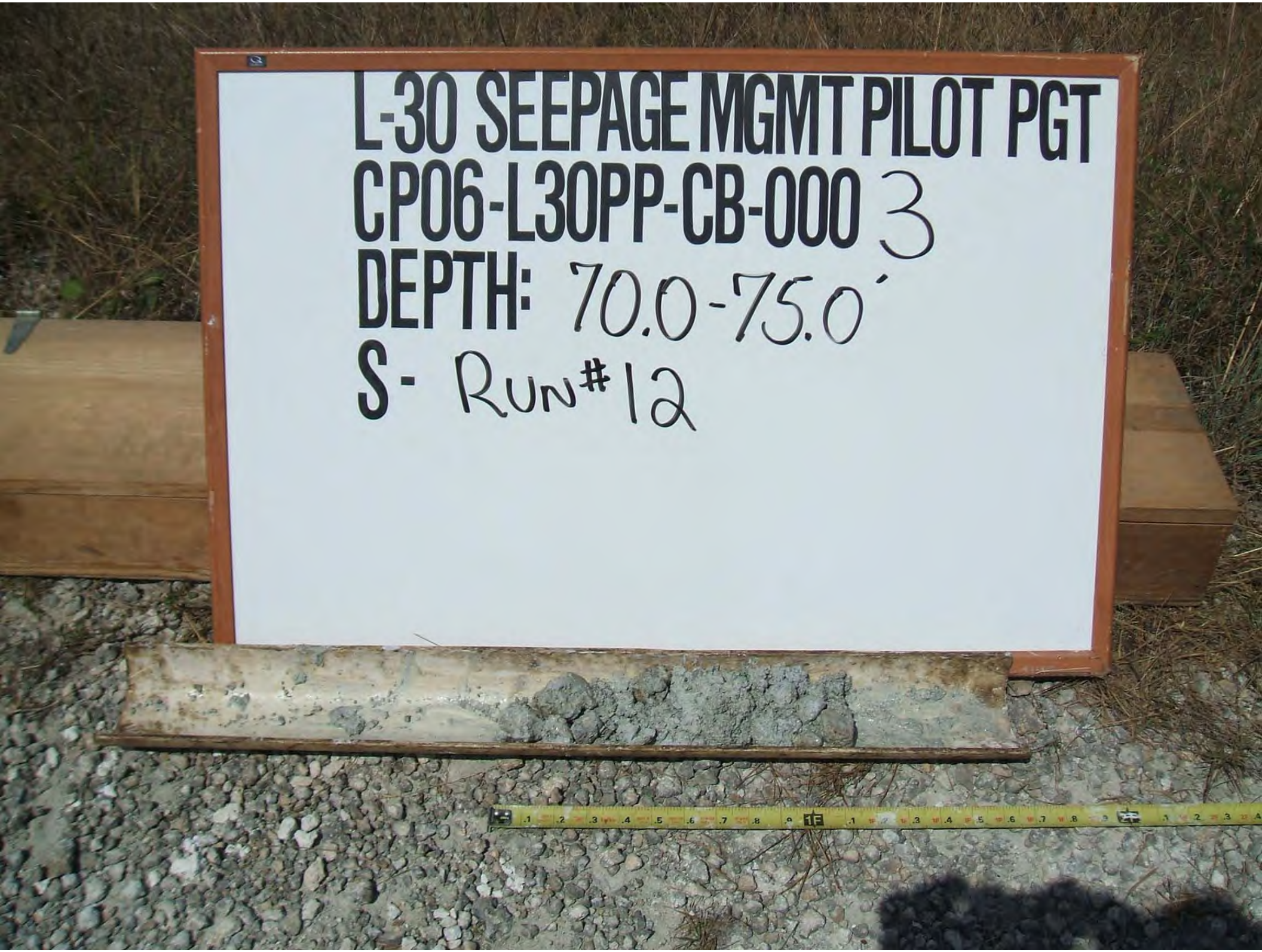

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000 3
DEPTH: 45.0-50.0'
S- Run# 7


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000 3
DEPTH: 50.0-55.0'
S- Run #8


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 55.0-60.0'
S- Run#9


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 60.0-65.0'
S- Run#10

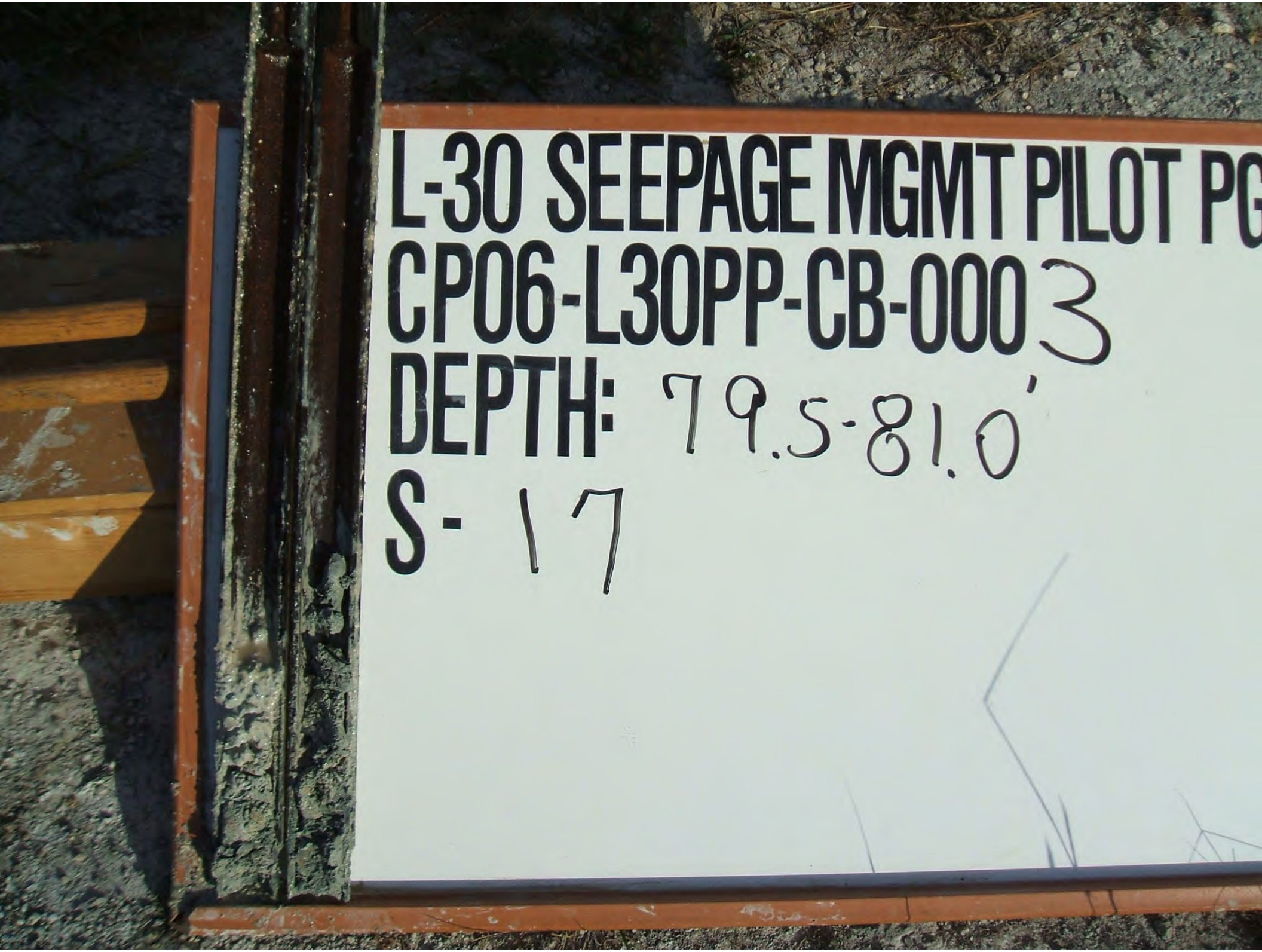

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 65.0-70.0'
S- Run#11


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-000 3
DEPTH: 70.0-75.0'
S- RUN#12

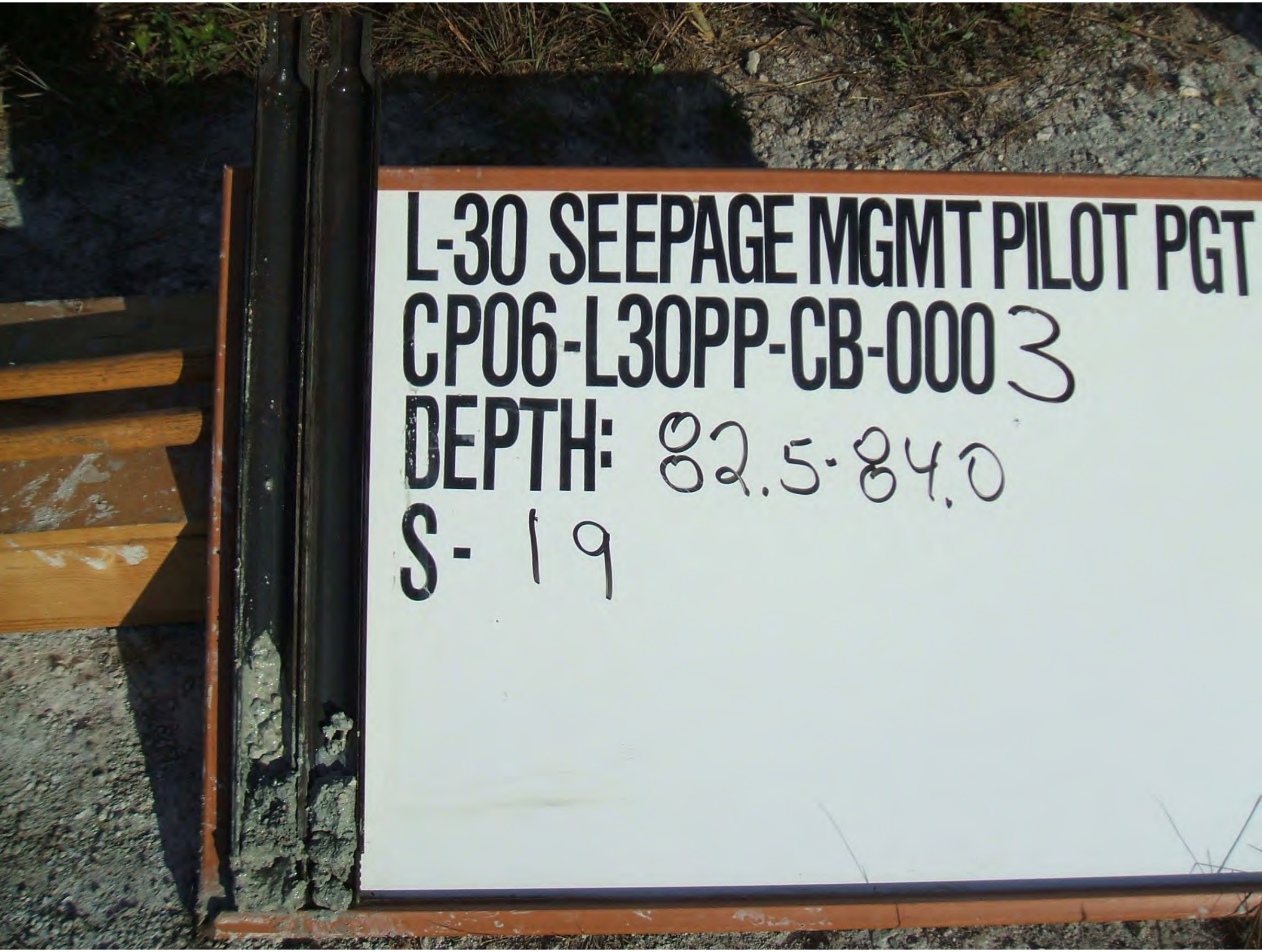

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 75.0-76.5
S-14


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 76.5-78.0'
S-15


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 78.0-79.5'
S-16


L-30 SEEPAGE MGMT PILOT PG
CP06-L30PP-CB-0003
DEPTH: 79.5-81.0'
S-17


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 81.0-82.5'
S-18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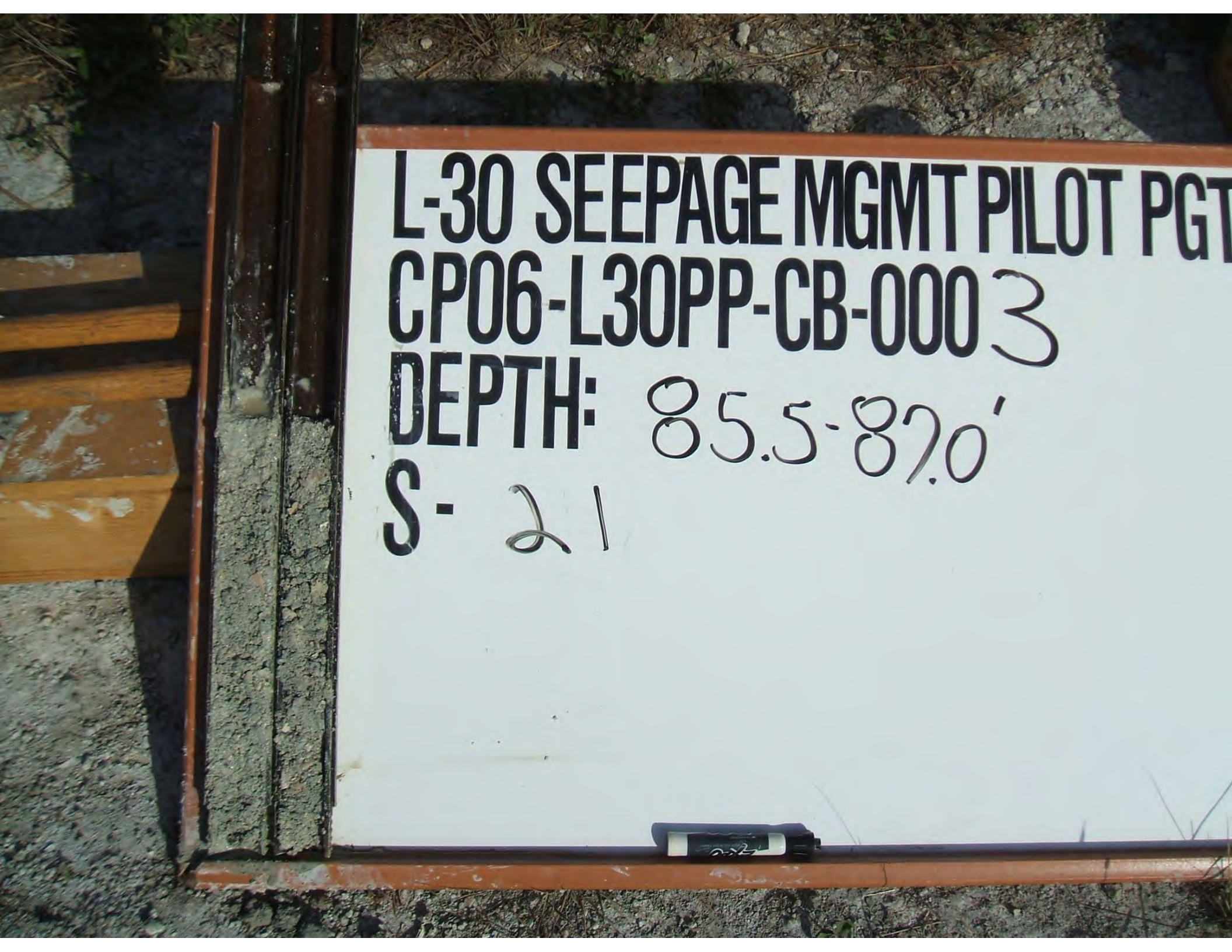
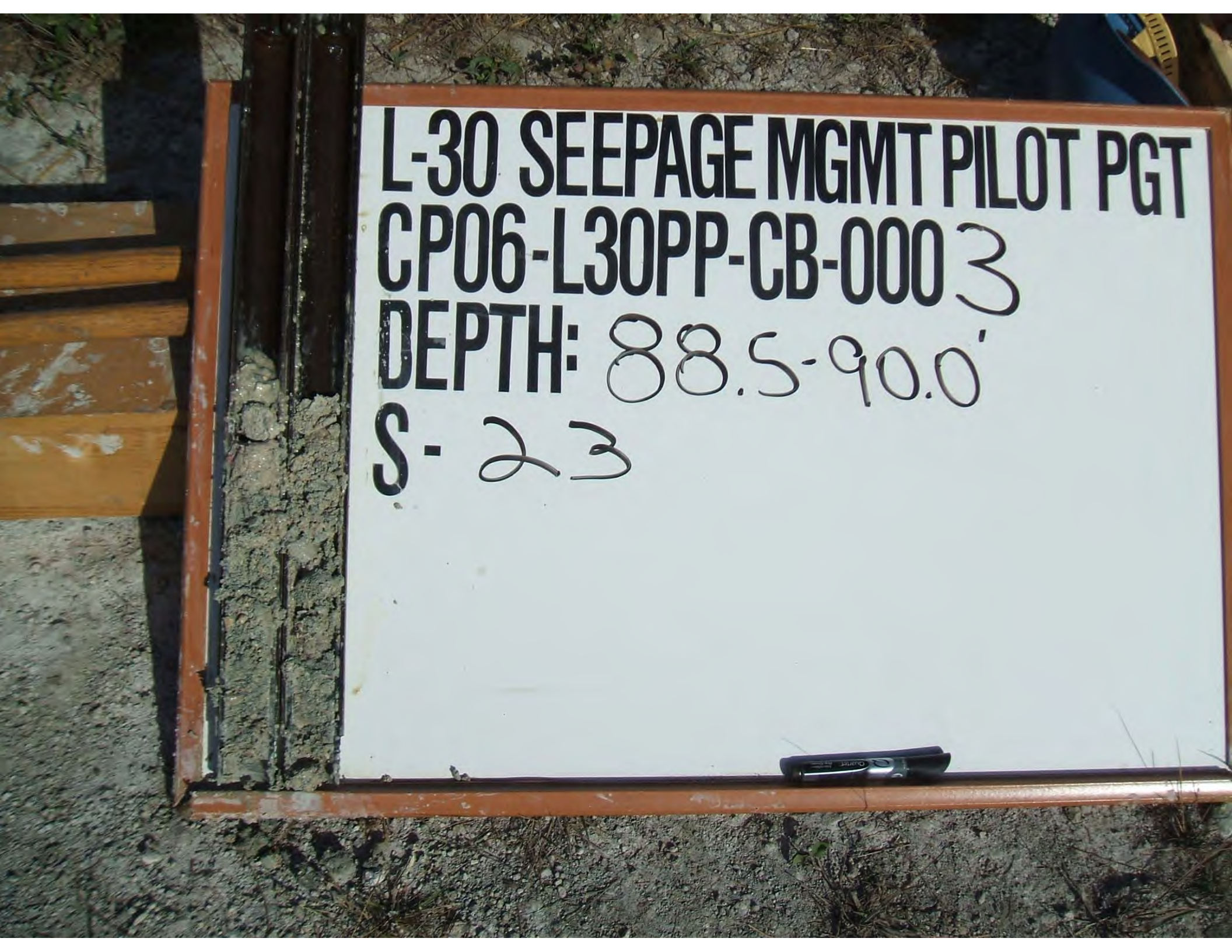
CP06-L30PP-CB-0003
DEPTH: 82.5-84.0
S-19


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 84.0-85.5'
S-20

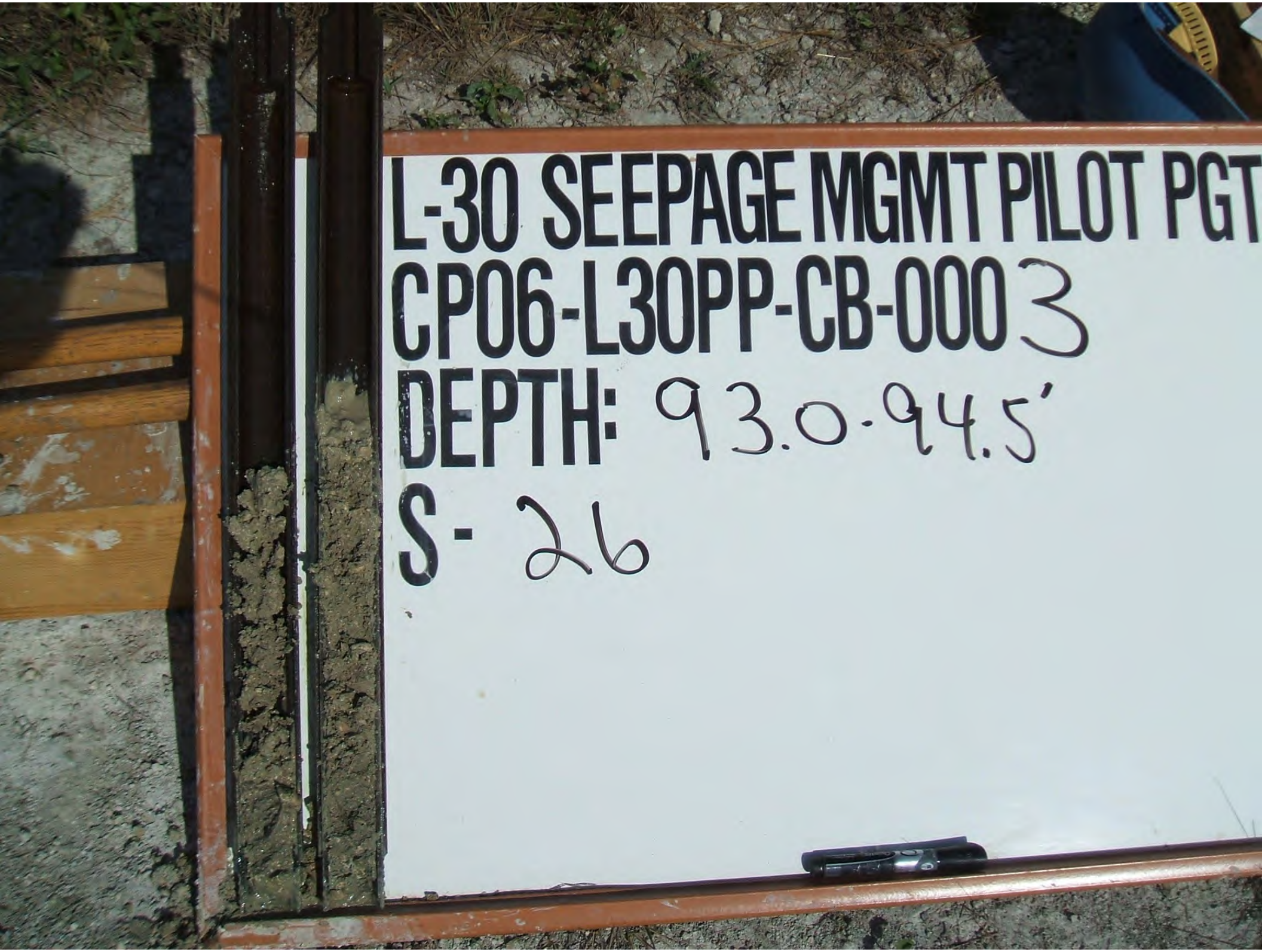

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 85.5-87.0'
S-21


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 87.0-88.5'
S-22


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 88.5-90.0'
S-23


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 90.0-91.5'
S-24


L-30 SEEPAGE MGMT PILOT P
CP06-L30PP-CB-0003
DEPTH: 91.5-93.0'
S-25

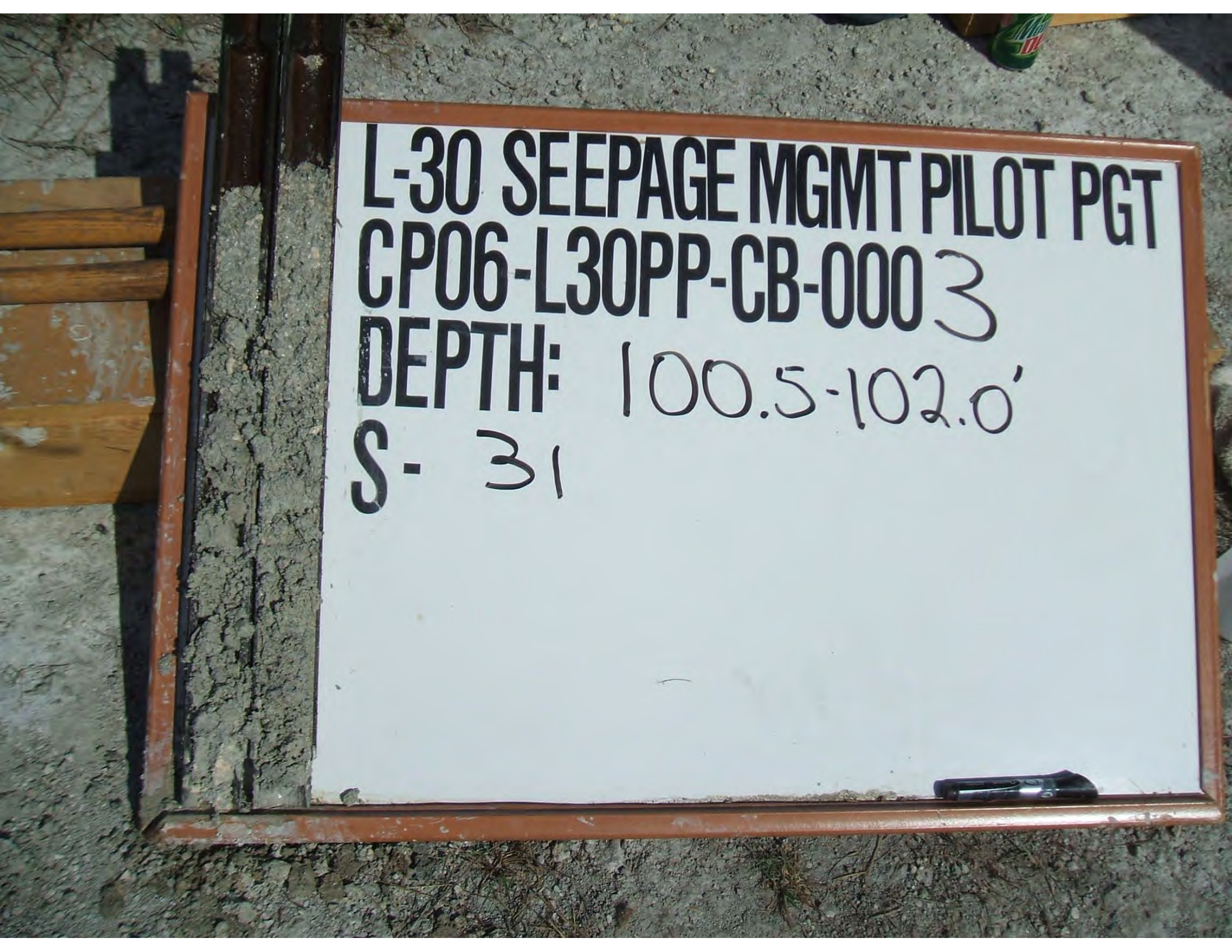

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 93.0-94.5'
S-26

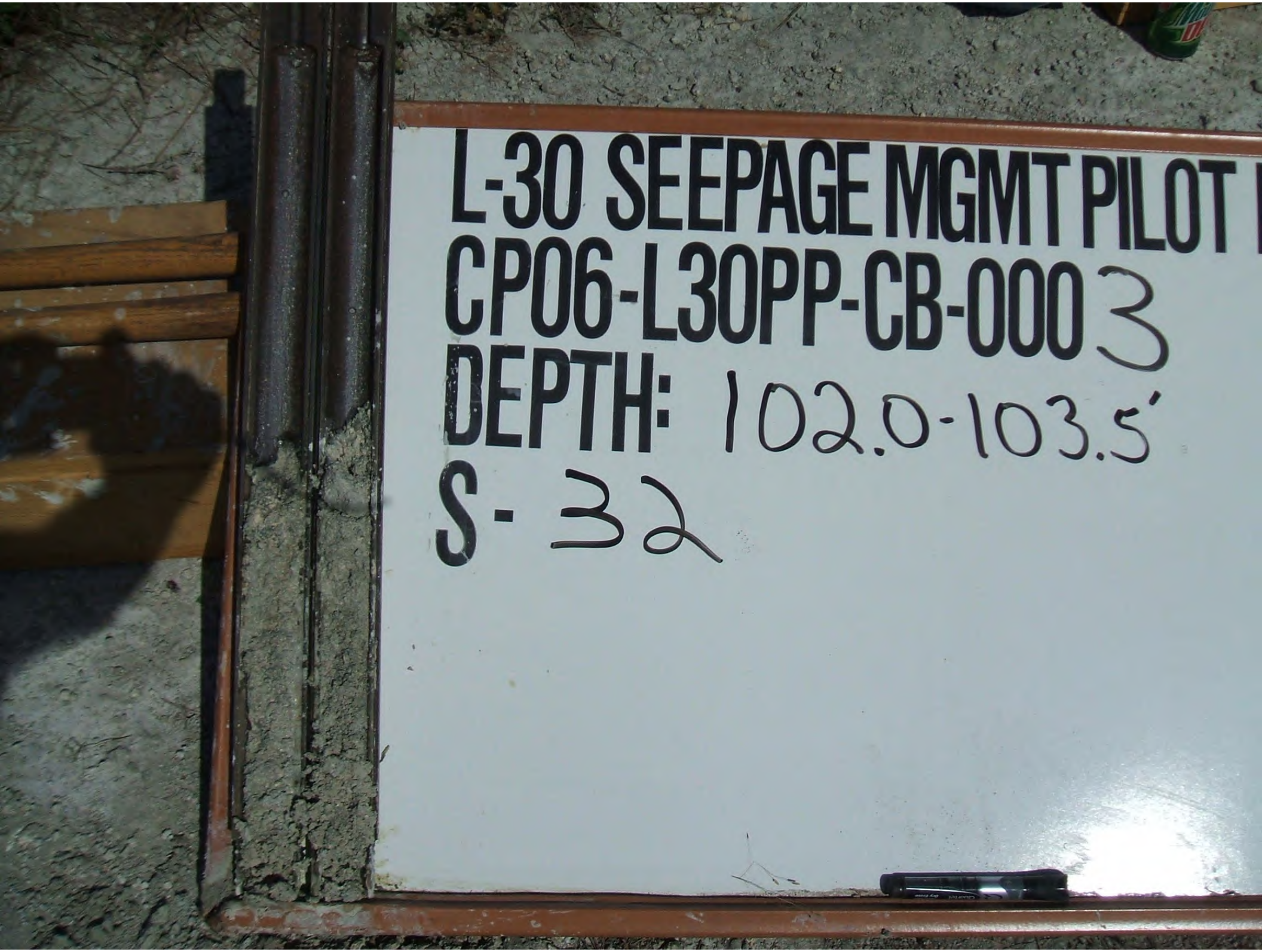

L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 94.5-96.0'
S-27


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 96.0-97.5'
S- 28


L-30 SEEPAGE MGMT PILOT
CP06-L30PP-CB-0003
DEPTH: 97.5-99.0'
S-29


L-30 SEEPAGE MGMT PILOT PG
CP06-L30PP-CB-0003
DEPTH: 99.0-100.5'
S-30


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 100.5-102.0'
S-31


L-30 SEEPAGE MGMT PILOT
CP06-L30PP-CB-0003
DEPTH: 102.0-103.5'
S-32


L-30 SEEPAGE MGMT PILOT PGT
CP06-L30PP-CB-0003
DEPTH: 103.5-105.0'
S-33

MONITORING WELL CONSTRUCTION DIAGRAMS

CHALLENGE ENGINEERING & TESTING, INC.

4234 HALLS MILL ROAD, MOBILE, ALABAMA 36693 (251) 666-1435

MONITORING WELL CONSTRUCTION LOG

PROJECT: **L-30 SEEPAGE MANAGEMENT PILOT PROJECT DADE COUNTY, FLORIDA**

LOCATION: **L-30 LEVEE (TAMIAMI TRAIL & KROME AVE.)**

BORING: **CP06-L30PP-MW-0001**

CHALLENGE JOB NO.: **2006D30**

DATE: **OCTOBER 20, 2006**

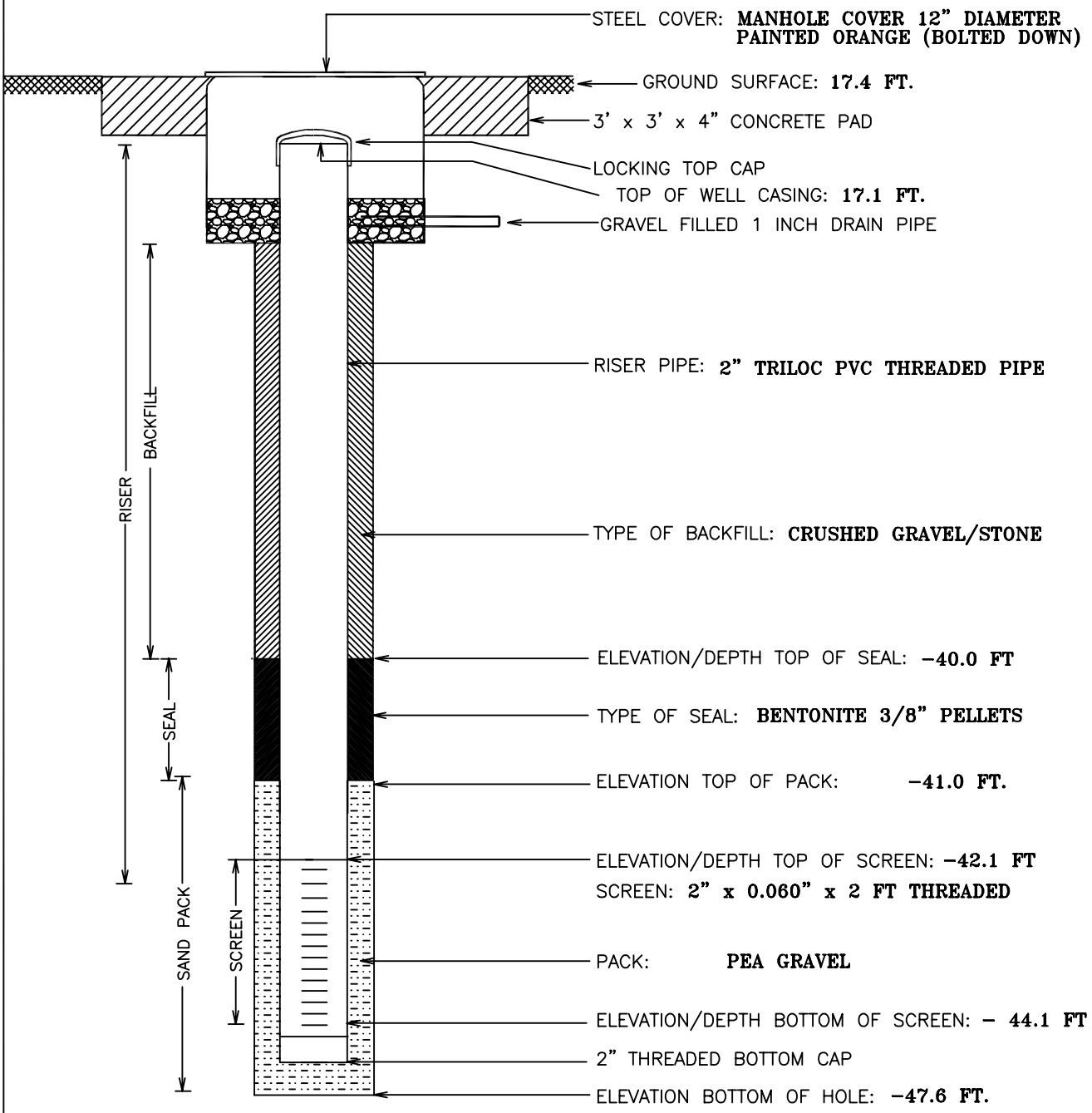
DRILLER: **ADAM BENSON**

DRILLING METHOD: **MUD ROTARY DRILLING**

DEVELOPMENT METHOD: **PUMPING/SURGING**

GROUND ELEVATION: **17.4**

LOCATION: TOP OF LEVEE L-30 (SOUTH SIDE OF ROADWAY)
N = 524,270 E = 826,074



CHALLENGE ENGINEERING & TESTING, INC.

4234 HALLS MILL ROAD, MOBILE, ALABAMA 36693 (251) 666-1435

MONITORING WELL CONSTRUCTION LOG

PROJECT: **L-30 SEEPAGE MANAGEMENT PILOT PROJECT DADE COUNTY, FLORIDA**

LOCATION: **L-30 LEVEE (TAMIAMI TRAIL & KROME AVE.)**

BORING: **CP06-L30PP-MW-0002**

CHALLENGE JOB NO.: **2006D30**

DATE: **OCTOBER 20, 2006**

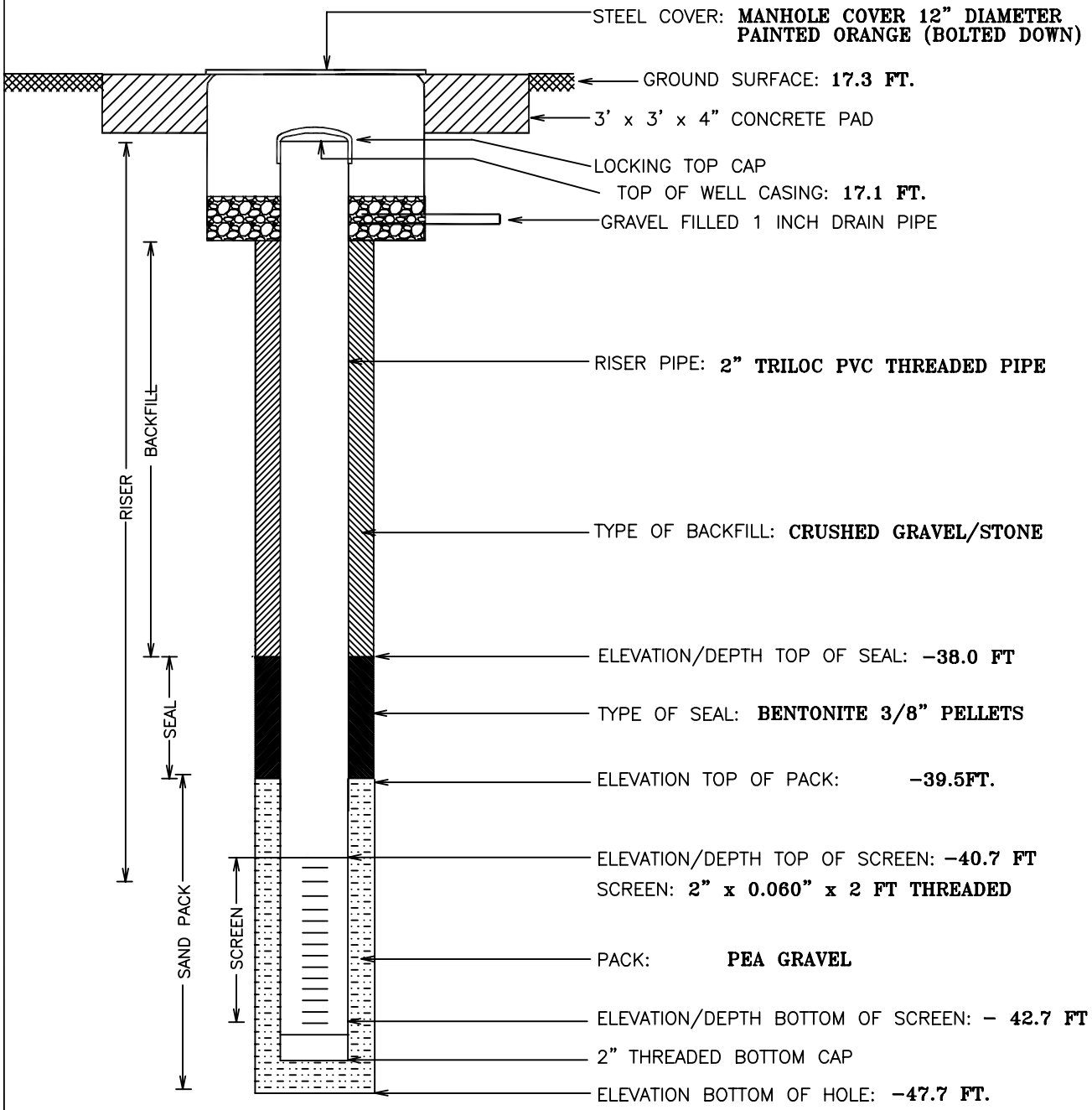
DRILLER: **ADAM BENSON**

DRILLING METHOD: **MUD ROTARY DRILLING**

DEVELOPMENT METHOD: **PUMPING/SURGING**

GROUND ELEVATION: **17.3 FT. NAVD88**

LOCATION: TOP OF LEVEE L-30 (SOUTH SIDE OF ROADWAY)
N = 522,036 E = 823,754



CHALLENGE ENGINEERING & TESTING, INC.

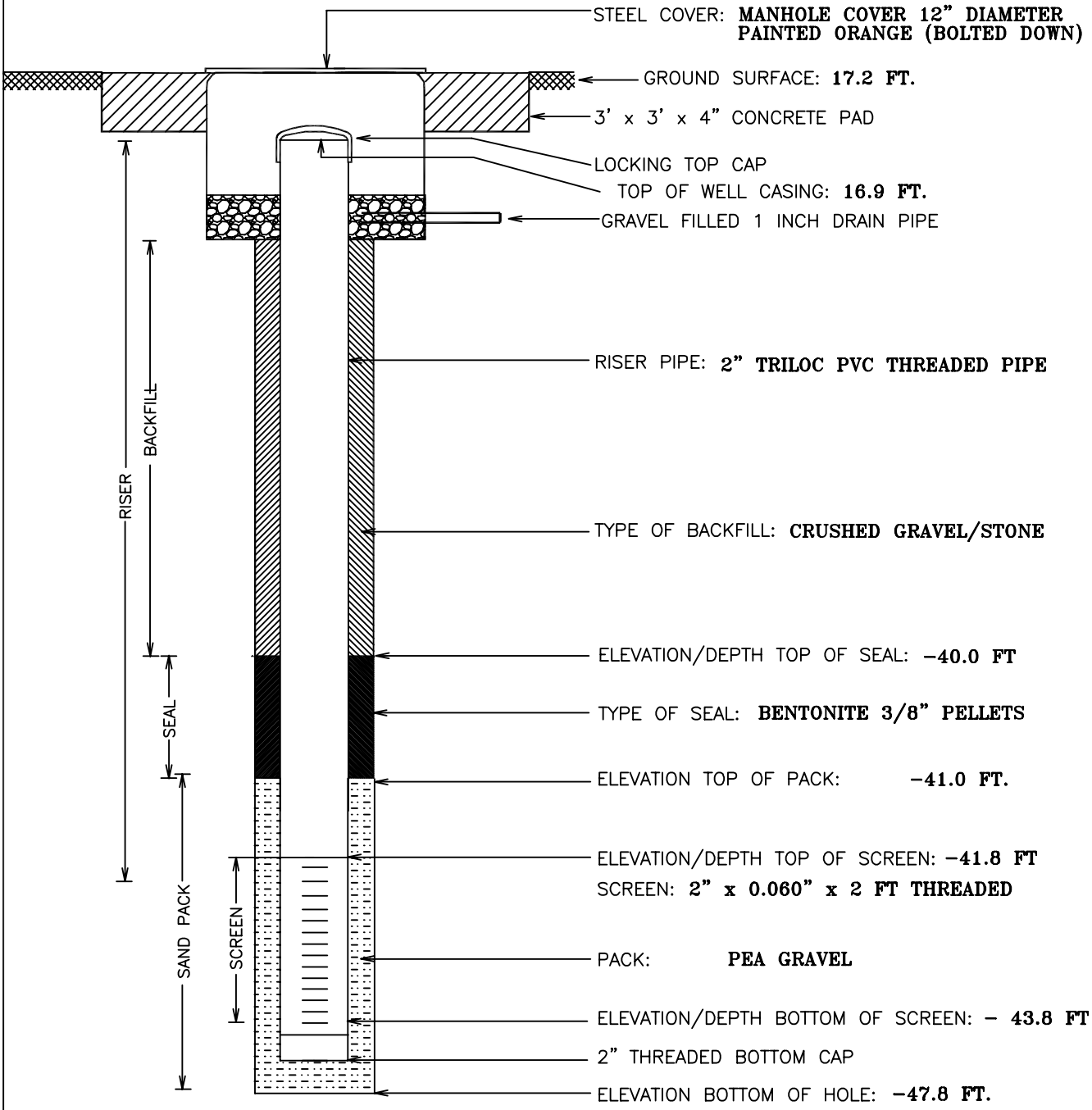
4234 HALLS MILL ROAD, MOBILE, ALABAMA 36693 (251) 666-1435

MONITORING WELL CONSTRUCTION LOG

PROJECT: **L-30 SEEPAGE MANAGEMENT PILOT PROJECT**
DADE COUNTY, FLORIDA
LOCATION: **L-30 LEVEE (TAMIAMI TRAIL & KROME AVE.)**
BORING: **CP06-L30PP-MW-0003**
CHALLENGE JOB NO.: **2006D30**
DATE: **OCTOBER 20, 2006**

DRILLER: **ADAM BENSON**
DRILLING METHOD: **MUD ROTARY DRILLING**
DEVELOPMENT METHOD: **PUMPING/SURGING**
GROUND ELEVATION: **17.2 FT. NAVD88**

LOCATION: TOP OF LEVEE L-30 (SOUTH SIDE OF ROADWAY)
N = 519,734 E = 821,356



CHALLENGE ENGINEERING & TESTING, INC.

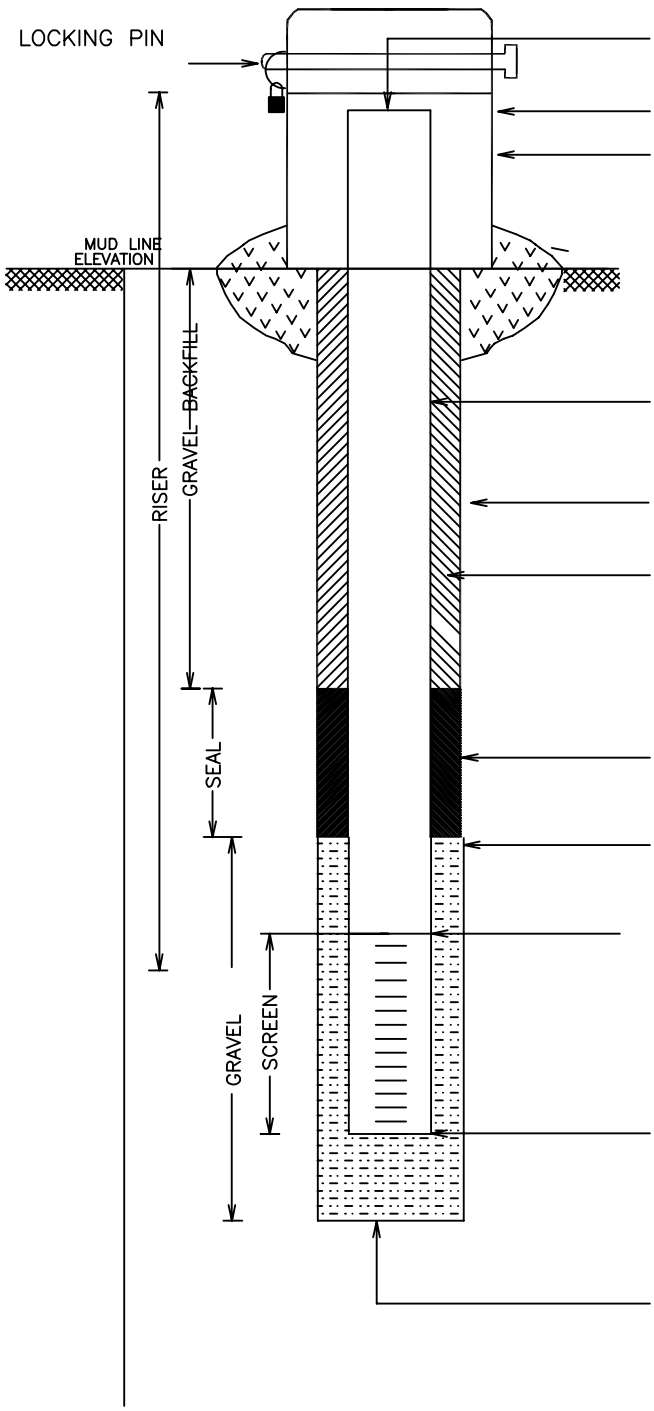
4234 HALLS MILL ROAD, MOBILE, ALABAMA 36693 (251) 666-1435

MONITORING WELL CONSTRUCTION LOG

PROJECT: **L-30 SEEPAGE MANAGEMENT PILOT PROJECT**
LOCATION: **DADE COUNTY, FL (TAMIAMI TRAIL & KROME AVE.)**
BORING: **CP06-L30PP-MW-0004**
CHALLENGE JOB NO.: **2006D30**
DATE: **NOVEMBER 2006**

DRILLER: **ADAM BENSON**
DRILLING METHOD: **ROLLER BIT - WET ROTARY**
DEVELOPMENT METHOD: **PUMPING/SURGING**
TOP OF CASING: **12.00 FT.**
FIELD GEOLOGIST: **BOB MOMBERGER, P.G.**

- MARINE WELL -



TOP CAP WITH VENT HOLE

ELEVATION OF TOP OF RISER PIPE: **12.00 FT.**

STICK-UP TOP OF SECURITY CASING: **6" SCHEDULE 80 PVC**

RISER PIPE: **2" TRILOC PVC THREADED PIPE**

BOREHOLE DIAMETER: **4.5"**

TYPE OF BACKFILL: **CRUSHED GRAVEL BACKFILL**

TYPE OF SEAL: **BENTONITE 3/8" PELLETS**

PEA GRAVEL BACKFILL

ELEVATION/DEPTH TOP OF SCREEN: **-23.8 FT.**
SCREEN: **2" x 0.060" x 2.0 FT THREADED**

ELEVATION/DEPTH BOTTOM OF SCREEN: **-25.8 FT.**

ELEVATION BOTTOM OF HOLE: **-30.0 FT**

CHALLENGE ENGINEERING & TESTING, INC.

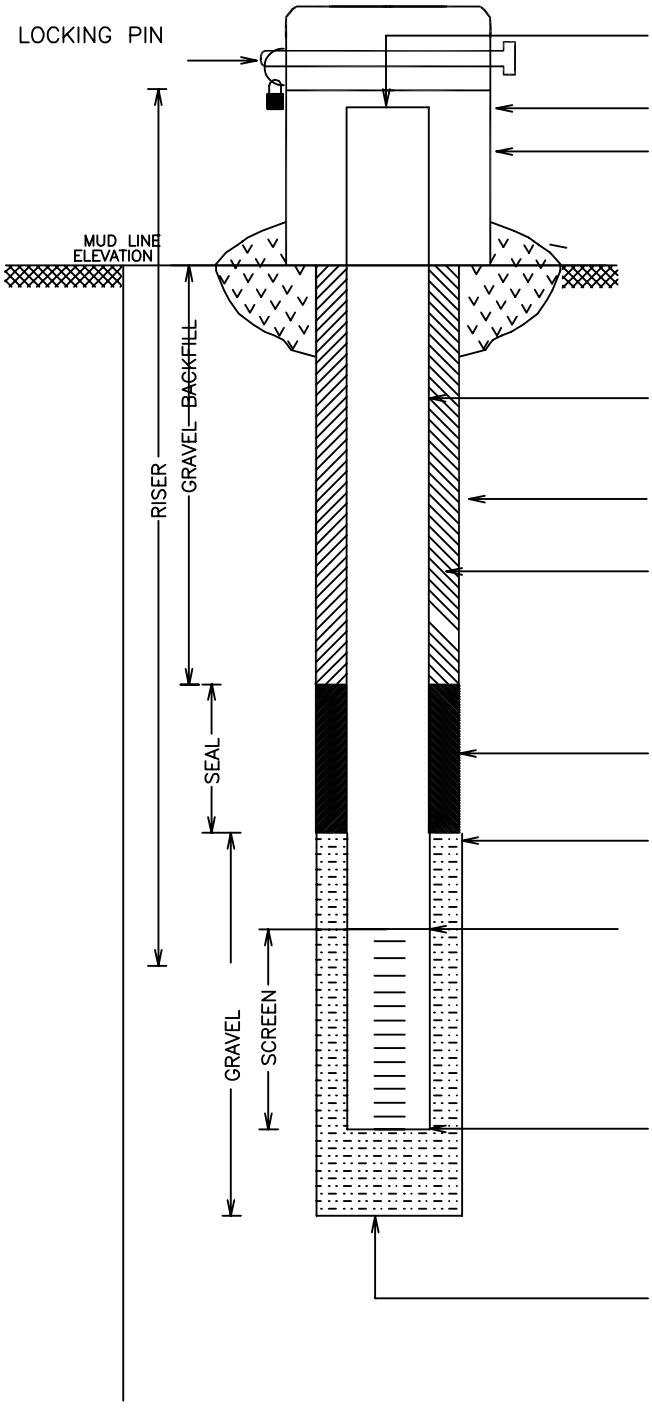
4234 HALLS MILL ROAD, MOBILE, ALABAMA 36693 (251) 666-1435

MONITORING WELL CONSTRUCTION LOG

PROJECT: **L-30 SEEPAGE MANAGEMENT PILOT PROJECT**
LOCATION: **DADE COUNTY, FL (TAMIAMI TRAIL & KROME AVE.)**
BORING: **CP06-L30PP-MW-0005**
CHALLENGE JOB NO.: **2006D30**
DATE: **NOVEMBER 2006**

DRILLER: **ADAM BENSON**
DRILLING METHOD: **ROLLER BIT - WET ROTARY**
DEVELOPMENT METHOD: **PUMPING/SURGING**
TOP OF CASING: **13.55 FT.**
FIELD GEOLOGIST: **BOB MOMBERGER, P.G.**

- MARINE WELL -



TOP CAP WITH VENT HOLE

ELEVATION OF TOP OF RISER PIPE: **13.55 FT.**

STICK-UP TOP OF SECURITY CASING: **6" SCHEDULE 80 PVC**

RISER PIPE: **2" TRILOC PVC THREADED PIPE**

BOREHOLE DIAMETER: **4.5"**

TYPE OF BACKFILL: **CRUSHED GRAVEL BACKFILL**

TYPE OF SEAL: **BENTONITE 3/8" PELLETS**

PEA GRAVEL BACKFILL

ELEVATION/DEPTH TOP OF SCREEN: **-26.20 FT.**
SCREEN: **2" x 0.060" x 2.0 FT THREADED**

ELEVATION/DEPTH BOTTOM OF SCREEN: **-28.20 FT.**

ELEVATION BOTTOM OF HOLE: **-31.5 FT**

CORE BOX INVENTORY REPORT & PHOTOGRAPHS

ENCP06-L30PP-CB-0001 L-30 Seepage M~BOX 1 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -0.2 TO -14.7; BOX ID: 1A Loca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0001 L-30 Seepage M~BOX 2 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -14.7 TO -24.7; BOX ID: 2ALoca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0001 L-30 Seepage M~BOX 3 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -24.7 TO -39.7; BOX ID: 3ALoca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0001 L-30 Seepage M~BOX 4 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -39.7 TO -50.7; BOX ID: 4ALoca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0001 L-30 Seepage M~BOX 5 OF 5 BOXES; BORING 1 OF 2 BORINGS; EL. -50.7 TO -87.7; BOX ID: ~Loca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0002 L-30 Seepage M~BOX 1 OF 4 BOXES; BORING 1 OF 1 BORING; EL. 0.2 TO -12.5; BOX ID: 6A Loca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0002 L-30 Seepage M~BOX 2 OF 4 BOXES; BORING 1 OF 1 BORING; EL. -12.5 TO -32.5; BOX ID: 7ALoca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0002 L-30 Seepage M~BOX 3 OF 4 BOXES; BORING 1 OF 1 BORING; EL. -32.5 TO -52.5; BOX ID: 8ALoca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0002 L-30 Seepage M~BOX 4 OF 4 BOXES; BORING 1 OF 1 BORING; EL. -52.5 TO -91.5; BOX ID: 9ALoca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0003 L-30 Seepage M~BOX 1 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -0.3 TO -11.8; BOX ID: 10ALoca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0003 L-30 Seepage M~BOX 2 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -11.8 TO -29.3; BOX ID: 1~Loca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0003 L-30 Seepage M~BOX 3 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -29.3 TO -44.8; BOX ID: 1~Loca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0003 L-30 Seepage M~BOX 4 OF 5 BOXES; BORING 1 OF 1 BORING; EL. -44.8 TO -86.3; BOX ID: 1~Loca~ 1BX PITCHFORDKARENEN-GG3295
ENCP06-L30PP-CB-0003 L-30 Seepage M~BOX 5 OF 5 BOXES; BORING 2 OF 2 BORINGS; EL. -86.3 TO -87.8; BOX ID: ~Loca~ 1BX PITCHFORDKARENEN-GG3295


L-30 SEEPAGE PROJECT
CP-06-L30PP-CB-0001
BOX 1 OF
17.5-32.6 FT
RUN#1
RUN#2
RUN#3
RUN#4


L30 SEEPAGE MGT. PROJECT
DADE CO., FL.
CP-06-L30PP-CB-0001
Box 2 OF
32.0 - 42.0 ft
RUN #4
RUN #5
RUN #5
RUN #6
36.6
L30 SEEPAGE MGT PLAN
DADE COUNTY, FL.
CP-06-L30PP-CB-0001
Box 3 OF


L30 SEEPAGE MGT. PLANET
DADE Co., FL.
CP-06-L30PP-CB-0001
Box 3 OF
42.0' — 57.0'
RUN #6
42.0
45.0' | | 45.0'
RUN #7
RUN #7
46.75'
50.0' | | 50.0'
RUN #8
55.0' | | 55.0'
L30 SEEPAGE MGT. PLAN
DADE CO., FL.
CP-06-L30PP-CB-0001
BOX OF


L30 SEEPAGE MGT. PROJECT
DADE CO., FL.
CO-06-L30PP-CO-0001
BOX 4 OF
57' - 68.0'
57.0
RUN# 9
60.0
63.0
RUN# 10
65.0
RUN# 11


L30 SEEPAGE MET. PROJECT
DADE CO., FL.
CP-06-L30PP-CB-0001
BOX 5 OF 5
68.0-185.0'
680'
RUN #11
70.0'
70.0'
RUN #12
750'
80.0
825'
1050'
XXXXXX


L30 SHEETFLOW MST PLOT
DADE CO, FL.
CP-06-L30PP-CA-000
Box 1 OF
173' - 300'
123'
RUN #1
200'
RUN #2
250'
RUN #3


L30 SEEPAGE MGT. PROJECT
DADE CO., FL.
CP-06-L30PP-CB-000
Box 2 OF
30.0 - 50.0'
30.0
RUN #4
35.0
35.0
RUN #5
40.0
40.0
RUN #6
45.0
45.5
RUN #7
50.0

L30 Sewage Mgt. Project
Dade Co., FL.
CP-06-L30PP-C4-0001
Box 1 of
50.0'

50.0'

62.0

Run #10

Run #8

65.0

65.0

Run #11

65.0

65.0


L 30 SEEPAGE MGT. PROJECT
DADE CO., FL.
CP-06-L30PP-CA-0001
Box 4 OF 4
70.0' - 109.0'
70.0'
RUN #12
85.0'
109


L30 SEEPAGE MGT. PROJECT
DADE CO., FL.
CP-06-L30PP-CB-0003
BOX 1 OF
● 17.5'-29.0'
17.5'
RUN# 1
20.0'
20.0'
RUN# 2
22.5'
RUN# 2
25.0
25.0
RUN# 3
19.0'


L30 SEEPAGE MGT PROJECT
DADE COUNTY, FL.
CP06-L30PP-CB-0003
Box 2 OF
28.0' - 46.5'
RUN #5
RUN#6
RUN#7


L30 SEEPAGE MGT. PROJECT
DADE Co., FL.
CP-06-L30PP-CO-0003
BOX 3 OF 5
46.5' - 62.0'
46.5
RUN # 7
50.0'
50.0'
RUN # 8
54.0'
RUN # 9
55.0'
55.0'
60.0'
60.0'
RUN #10

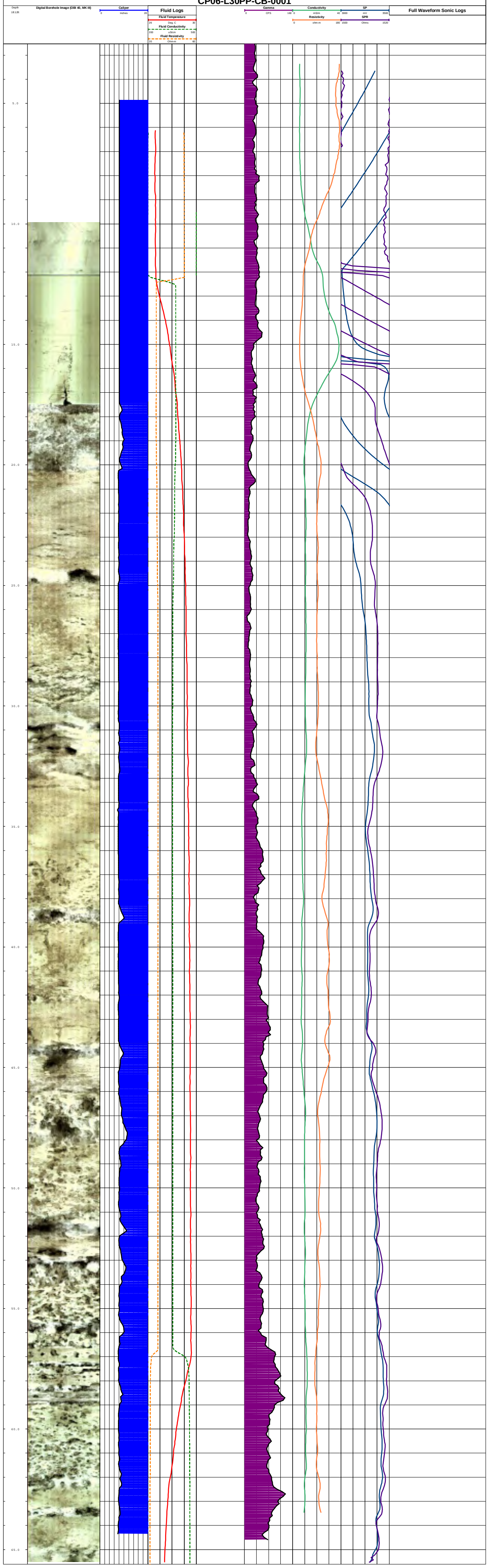

L30 SEEPAGE MGT PROJECT
DADE Co, FL
CP06-L30PP-CB-0003
BOX 4 OF 4
67.0' – 103.5'
62.0
RUN # 10
65.0
65.0
RUN #11
70
70.0
RUN # 12
75.0
75.0
79.5'
79.5'
103.5'

U.S.G.S. BOREHOLE LOGS

USGS-FISC Fort Lauderdale, Florida

WELL	CP06-L30PP-CB-0001	PROJECT	L-30 Seepage Management Project	DATE OF COMPLETION	October 2006
LOCATION	25 - 00 - 00.0 N (NAD 83)	ELEVATION	20 Feet (Est. FM TOPO, NGVD 29)	WELL DEPTH	
	080 - 29 - 00.0 W	DATE OF INITIAL LOGGING	10 October 2006		

CP06-L30PP-CB-0001

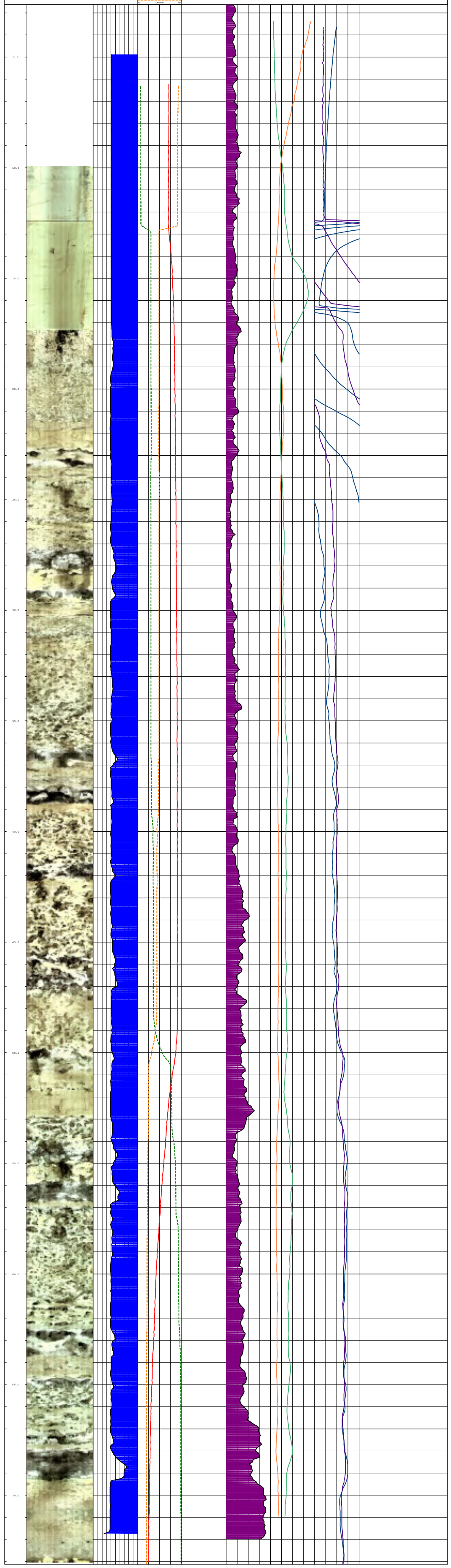


USGS-FISC Fort Lauderdale, Florida

WELL	CP06-L30PP-CB-0002	PROJECT	L-30 Seepage Management Project	DATE OF COMPLETION	October 2006
LOCATION	25 - 46 - 08.4 N (NAD 83)	ELEVATION	20 Feet (Est. FM TOPO, NGVD 29)	WELL DEPTH	
	080 - 29 - 26.8 W	DATE OF INITIAL LOGGING	10 October 2006		

CP06-L30PP-CB-0002

Depth 1ft:12ft	Digital Borehole Image (OBI 40, MK III)	Caliper 0 Inches 20	Fluid Logs: Fluid Temperature 22 Deg. C 30; Fluid Conductivity 100 uS/cm 620; Fluid Resistivity 0 Ohm-m 80	Gamma 0 CPS 140	Conductivity 0 mS/m 40; Resistivity 0 ohm-m 400	SP 2900 mV 3600; SPR 1560 Ohms 1620	Full Waveform Sonic Logs



U. S. Geological Survey, Center for Water and Restoration Studies, Miami, Florida

WELL	CP06-L30PP-CB-0003	**PROJECT**	L-30 Seepage Management Project	**DATE OF COMPLETION**	October 2006
LOCATION	25 - 45 - 45.7 N (NAD 83) 080 - 29 - 53.1 W	**ELEVATION**	20 Feet (Est. FM TOPO, NGVD 29)	**WELL DEPTH**	

CP06-L30PP-CB-0003