

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

CHALLENGE

P. O. Box 91537 4234 Halls Mill Road Mobile, Alabama 36691 Phone: (251) 666-1435 Fax: (251) 666-1438 Email: challengetesting@aol.com

ENGINEERING & TESTING, INC.

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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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 F Northing	Florida East 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
		Тс	op of Casing	1
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	NAD 1983 F	Florida East	Top Of
Number	Northing	Easting	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

4" WIRELINE CORING SYSTEM USED TO SAMPLE TO ROCK



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









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





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

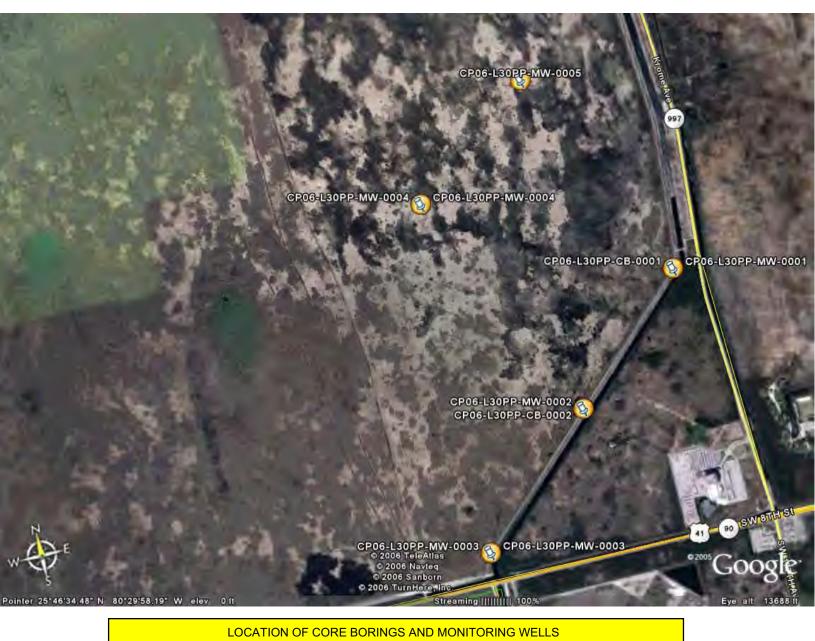


ATV SWAMP MOUNTED DRILL BUGGY ON-SITE



MONITORING WELL PLATFORM

BORING LOCATION MAP



L-30 SEEPAGE MANAGEMENT PILOT PROJECT DADE COUNTY, FLORIDA

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

Miami-Dade County, Florida

			DIVIS	ION			IN	STAL	LATIC		g boolghadon		SHEET	1	
	LLING	LOG	So	outh Atlanti	с			Jack	sonv	rille D	istrict			SHEETS	
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6. THIC	KNESS OF	OVERB	URDEN	N/A							OP OF BORING	17.3 Ft.			
7. DEP	. DEPTH DRILLED INTO ROCK N/A									VERY FOR BORING					
в. тот	DTAL DEPTH OF BORING 105.0 Ft.					18. SIGNATURE AND TITLE OF INSPECTOR Bob Momberger, Geologist									
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PROJEC			- •		Jacksonville District COORDINATE SYSTEM/DATUM HORIZONTAL						
		Manag	gement Pilot Project	COORDINATE SYSTEM/DATUM HORIZONTAL VERTICAL State Plane, FLE (U.S. Ft.) NAD83 NAVD88							
	ON COORDI					OFE	BORIN	G			
X = 8	826,073	Y = 5	24,279	17.3	Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATER	RIALS	REC.	BOX OR SAMPLE	RQD OR UD		REMAI	RKS	0.5 FT.
									Advanced w/ tricone	l Boring e roller bit	
-0.2	17.5 Moderately Weathered		LIMESTONE, oolitic, fossiliferous moderately hard, moderately wea aphanitic, pitted, Ft. Thompson Fr 5Y 8/2 pale yellow	ithered, ormation,	80	1	RQD 0	-0.2 2	4 x 5-1/2" Diamond DT = 1 HP = 25 DFR =	mins 50 psi	Bit
			From EI2.7 to -11.2 Ft., weathe bedding, vuggy	red, thick	80	2 BOX	RQD 25	-7.7	4 x 5-1/2" Diamond DT = 7 HP = 25 DFR = 1	mins 50 psi	Bit
	. Weathered		➤From El11.2 to -12.7 Ft., soft, 5			3	RQD 30		4 x 5-1/2" Diamond DT = 7 HP = 25 DFR =	mins 50 psi	Bit
	Slightly Weathered		From El12.7 to -17.7 Ft., moder slightly weathered, thick bedding, 5Y 8/2 pale yellow	ately hard, vuggy,	100	4 BOX 2	RQD 80		4 x 5-1/2" Diamond DT = 4 HP = 25 DFR =	mins 50 psi	Bit

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DR	ILLING	LOC	G (Cont. Sheet)			Distr	ict					IEETS
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			aphanitic, massive bedding, vuggy filled vugs, 5Y 8/1 white	hered, , sand		вох	70		DT = HP =	3 mins 250 psi	nated Bit	
	bated		∿At El22.7 Ft., 2.5Y 8/1 white		100	6	RQD 100	4 x	DT = HP =	3 mins 250 psi	nated Bit	
	Unweathered		porous, 5Y 8/1 white			, вох	43	4 x	DT = HP =	3 mins 250 psi	nated Bit	
			From El32.7 to -37.7 Ft., modera thin bedding, vuggy	ately hard,	50	8			DT = HP =	5 mins 250 psi	nated Bit	

SAJ FORM 1836-A

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			rom El37.7 to -47.7 Ft., medium vuggy, 2.5Y 8/1 white	bedding,		BOX 3	RQD	DT = 4 m HP = 250 DFR = 0	npregnated Bit ins psi	
	nered				100	вдх	RQD 55	4 x 5-1/2" Diamond Ir DT = 4 m HP = 250 DFR = 0	ins psi	
	Unweathered		✓From EI47.7 to -52.7 Ft., thick be vuggy, clay filled vugs, 2.5Y 7/1 ligh	dding, nt gray	100	11	RQD 90	4 x 5-1/2" Diamond Ir DT = 4 m HP = 250 DFR = 0	ins psi	
			ƳFrom El52.7 to -57.7 Ft., thin bed sand filled vugs	lding,		5		4 x 5-1/2" Diamond Ir DT = 4 m HP = 250	ins psi	

SAJ FORM 1836-A JUN 02

DR	LLING	LO	G (Cont. Sheet)	INSTALLA Jackso		Distr	ict			SHEET OF 6	5 SHEETS
PROJEC	т			COORDINA		HORIZONTAL	VERTICAL				
L-30	Seepage	Mana	gement Pilot Project	State F	Plane,	FLE	(U.S.	Ft.)	NAD83	NAVD88	
	ON COORD			ELEVATIO		OF E	BORIN	G			
X = 8	326,073		24,279	17.3 F	t.		-				
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-57.8	75.1	> >> >	SAND, silty, mostly carbonate, Pin	necrest		13	RQD	4	x 5-1/2" Diamond Im	pregnated, Bu	H
			SHELL, mostly angular coarse gra flat and elongated shell up to 1", s	ome	27	14		50.0	SPT Sampl	er <u>0</u> 0	0
			strong reaction with UCL wat 10V	8/1 light			-	-59.2		3	
			greenish gray		27	15			SDT Sampl		
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-62.2	79.5	: ככ כ						-62.2		1	
		 <u>†</u> + <u>†</u> +	SAND, silty, mostly fine-grained sa quartz, some angular sand to grav							2	
		 + <u>†</u> + <u>†</u>	shell up to 1/2", few silt, strong rea HCI, wet, 10G 4/1 dark greenish g	action with	80	17			SPT Sampl	er <u>1</u>	3
		 <u>†</u> <u>+</u> <u>†</u> +		,				-63.7		2	J
		 +!+!	At El63.7 Ft., low plasticity, trace	e clay						3	
		I I+I+			97	18			SPT Sampl	er 2	
								-65.2		3	5
		 <u> </u> + <u> </u> +	At El65.2 Ft., nonplastic, mostly					00.2		8	
		 + <u>†</u> + <u>†</u>	fine-grained sand-sized quartz, so angular sand to gravel-sized shell		93	19			SPT Sampl	er 5	
		 <u>†</u> <u>+</u> <u>†</u> +	few silt, strong reaction with HCl, v 5Y 6/1 gray					-66.7		8	13
		 + <u>†</u> + <u>†</u>	51 0/1 glay					-00.7		2	
		 ! + ! +			97	20			SPT Sampl		_
		 +‡+‡							or r oump		- 17
		 						-68.2		14	
		 +‡+‡									
		11+1+			97	21			SPT Sampl		- 35
-69.7	87.0		SHELL, mostly angular fine to coa	reo	 			-69.7		16	
			gravel-sized flat and elongated she	ell up to						14	
		p ∞ :	FX 9/1 white	HCI, wet,	97	22			SPT Sampl	er <u>12</u>	24
								-71.2		12	
		> >> > > >> >								12	
))))))))			90	23			SPT Sampl	er <u>10</u>	20
))))))))						-72.7		10	
		> >> : > >> :								18	
					97	24			SPT Sampl	er 23	
74.2	91.5				1			-74.2		33	56
			SHELL, mostly fine-grained sand-				1			16	
		>>>> >>>>	gravel-sized shell up to 1/2", few s	ilt, strong	97	25			SPT Sampl	er 18	
		þ >> :	reaction with HCI, wet, 5Y 8/1 whit					-75.7		29	47
			At El75.7 Ft., weak cementation		\vdash			-13.1			_
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DRI	LLING	LO	G (Cont. Sheet)	INSTALLA Jackso		Distr	ict			SHEET OF 6 S	
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		>>>>	SHELL, mostly angular coarse gra flat and elongated shell up to 1-1/2	vel-sized	07	07				25	70
			fine-grained sand-sized quartz, str	ong	97	27		-78.7	SPT Sample	er 45	70
			reaction with HCl, wet, weak ceme 5Y 6/1 gray	entation,						29	
					97	28			SPT Sample	er 9	18
-80.2	97.5							-80.2		9	10
			SAND, silty, mostly fine to coarse- sand-sized sandstone up to 1/2", li							10	
			medium-grained sand-sized shell u strong reaction with HCl, wet, wea	up to 1/8",	90	29			SPT Sample	er 7	15
			cementation, 5Y 7/1 light gray (SN					-81.7		8	10
										7	
					90	30			SPT Sample	er 11	_ 21
								-83.2		10	
			NATEL 027 Et como fino to modi	um arcined						14	_
			At El83.7 Ft., some fine to mediu sand-sized shell up to 1/2"	um-graineu	90	31			SPT Sample		47
								-84.7		23	
										15	_
					90	32			SPT Sample		11
								-86.2		5	_
										12	_
					90	33			SPT Sample		26
-87.7	105.0							-87.7		14	_
			NOTES:					140# ham 2.0' split s	mer w/30" drop use spoon (1-3/8" I.D. x 2	d with 2" O.D.).	
			 Soils are field visually classified accordance with the Unified Soils Classification System. Set 17.5 Ft. of 8" Schedule 40 I Through Center of L-30 Levee To Rock. 	PVC Pipe				Abbreviati WOH = DT = D HP = H			
			 Boring Drilled/Sampled In Thre A. Set Surface Casing. B. 4" Wireline Rock Coring To Bas C. Splitspoon Sampling 30 Ft. Belo Rock. 	e Of Rock.							
			4. Borehole Reamed To 7.5" To E Rock. USGS Performed Borehole								
			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 se	diment.							
						l I					

CPO6-L30PP-CB-OOOL DEPTH: 17,5-200 Run#7

T.J.J

2F

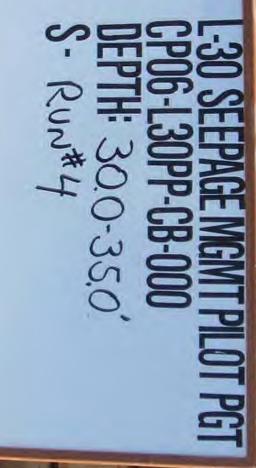
CPO6-L30PP-CB-0001 DEPTH: 200-250' S-Runta

and the

COL.

S-RUN#3050-300 S-RUN#300-300

.



CPO6-L30PP-CB-000 DEPTH: 35.0-400 **S**- Run*5

S-Runt 400-450

CPO6-L30PP-CB-000_1 DEPTH: 45.0.50.0 S- Run # 7

S- Row * 8 S- Row * 8

CPO6-L30 SEEPAGE MGMT PLOT PGT DEPTH: 55.0-60.0 S-Runt 9

CPO6-L30 SEEPAGE MGMT PLOT PGB-L30 SEEPAGE MGMT PLOT PGB-L30 PP-CB-000_1 DEPTH: 60:0-65:0 S- Run *10

S-Run#11

S- Runting S- Runting

S-14 S-14

CPO6-L30PP-CB-000_L DEPTH: 76.578.0' S 5

L-30 SEEPAGE MGMTPILOT PGT CP06-L30PP-CB-000_L DEPTH: 78.0-79.5 S-16

CP06-L30 SEEPAGE MGMTPILOT

CPOG-L30PP-CB-0001 PU PG-06-L30 SEEPAGE MGMT PILOT PG-0001 PC-0001 PU PC-0001 S 0

CPO6-L30PP-CB-O00_L DEPTH: 82.5'-840 9

CPO6-L30PP-CB-O001 DEPTH: 840-855 20

CPO6-L30 SEEPAGE MGMTPILOT P DEPTH: 87.0-88.5

CPO6-L30PP-CB-0001 DEPTH: 870-88.5

CPO6-L30PP-CB-0001 DEPTH: 90.0-91.5 S- 24 90.0-91.5

CPO6-L30PP-CB-000_1 DEPTH: 91.5-93.0 25

CPO6-L30PP-CB-0001 DEPTH: 93.0-945 5000

CPO6-L30PP-CB-0001 PGT DEPTH: 94.5-96.0 3

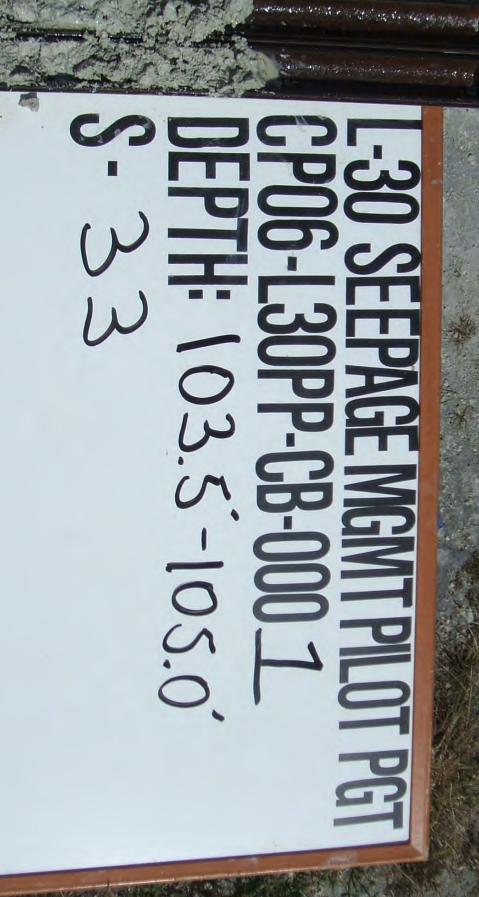
CPOG-L3OPP-CB-000 1 DEPTH: 960-975 200

CPOG-L30PP-CB-0001 DEPTH: 97.5-99.0 S-29

CPOG-L30 SEEPAGE MGMTPILIOT PGT DEPTH: 99.0-100.5' () ()

CPOG-L30PP-CB-0001 DEPTH: 100.5 - 102.0 W

CPOG-L30PP-CB-0001 DEPTH: 102.0-1035' S-32



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

Miami-Dade County, Florida

DRILLING LOG South Atlantic Jacksonville District OF 7 SHEETS 1. PROJECT 9. SIZE AND TYPE OF BIT See Remarks Vertical L-30 Seepage Management Pilot Project 10. COORDINATE SYSTEM/DATUM HORIZONTAL VERTICAL Top Of Levee L-30 (Center of Roadway) LOCATION COORDINATES State Plane, FLE (U.S. Ft.) NADB3 NAVD88 2. BORING DESIGNATION LOCATION COORDINATES CONTRACTOR FILE NO. CME 55 Truckrig MANUAL HAMMER CP06-L30PP-CB-0002 X = 823,753 Y = 522,044 11. MANUFACTURER'S DESIGNATION OF DRILL AUTO HAMMER Challenge Engineering & Testing, Inc. 2006D30 12. TOTAL SAMPLES DISTURBED UNDISTURBED (UD) Challenge Engineering & Testing, Inc. 2006D30 12. TOTAL NUMBER CORE BOXES 4 Adam Benson 13. TOTAL NUMBER CORE BOXES 4 4 Adam Benson 14. ELEVATION GROUND WATER 5.0 Ft. 10-06-06 10-17-06 S. DIRECTION OF BORING DEG. FROM BEARING 15. DATE BORING 17.5 Ft. COMPLETED S. THICKNESS OF OVERBURDEN N/A 16. ELEVATION TOP OF BORING 17.5 Ft. 10-17-06 B. THICKNESS OF OVERBURDE				DIVISIO	N			INCT	<u> </u>			<u>g = eeigiiaaiei</u>				٦
I. PROJECT 9. SIZE AND TYPE OF BIT See Remarks. L-30 Seepage Management Pilot Project 10. GOORDINATE SYSTEMDATUM HORIZONTAL VERTICAL Top Of Levee L-30 (Center of Roadway) State Plane, FLE (U.S. FL) NADD83 NAVD88 2. BORING DESIGNATION LOCATION COORDINATES CONTRACTURETS DESIGNATION OF DRILL AVD83 NAVD83 2. BORING DESIGNATION LOCATION COORDINATES CONTRACTURETS DESIGNATION OF DRILL AVD83 NAVD83 3. DOILLING AGENCY CONTRACTOR FILE NO 12. TOTAL SAMPLES DISTURBED (UD) Challenge Engineering & Testing, Inc. 2006D30 12. TOTAL NUMBER CORE BOXES 4 Adam Benson . . STATED COMPLETED 10.06-06 10-17-06 S. DIRECTION OF BORING UPETICAL VERTICAL 15. DATE BORING 17.07 TA RECOVERY FOR BORING 65 % C. DEPTH ORILLED INTO ROCK N/A 16. ELEVATION TOP OF BORING 17.5 FL. 10.0-06-06 10-17-06 S. TOTAL DEPTH OF BORING 109.0 FL Bob Momberger, Geologist Bob Momberger, Geologist Bob Momberger, Geologist ELEV. DEPTH 0 CLASSIFICATION OF MATERIALS X X Marced Boring	DRI	LLING	LOG									istrict				s
L-30 Seepage Management Pilot Project Top Of Levee L-30 (Center of Roadway) BORNO BESIGNATION OF DATAL State Plane, FLE (U.S. FLE (U	1. PRO	JECT		1 0000				_					e Remarks			-
Top Of Levee L-30 (Center of Roadway) State Plane, FLE (U.S. F.L) NAD83 NAVD88 CONTRACTOR FLE NO. CONTRACTOR FLE NO. CM ESTINGED UNDISTUREED	1.	-30 Seepa	de Mai	nagement l	Pilot Proiec	t								VERTIC	AL	-
2. BORING DESIGNATION LOCATION COORDINATES CP06-L30PP-CB-0002 X = 823,753 Y = 522,044 3. DRILLING AGENCY Challenge Engineering & Testing, Inc. 2006D30 4. AMB OF DRILLER Adam Benson 5. DIRECTION OF BORING DIRECTION OF BORING DIRECTION OF BORING DIRECTION OF BORING DIRECTION OF BORING 5. DIRECTION OF BORING DIRECTION OF BORING DIRECTION OF BORING DIRECTION OF BORING DIRECTION OF BORING 1. ELEVATION GOUND WATER 5. DIRECTION OF BORING DIRECTION OF BORING DIRECTION OF BORING 1. ELEVATION TOP OF BORING 5. THICKNESS OF OVERBURDEN 7. DEPTH DIRLED INTO ROCK 7. DEPTH DIRLED INTO ROCK 109.0 Ft. ELEV. 17.5 0.0 17.5 0.0 17															/D88	
CP06-L30PP-CB-0002 X = 823.753 Y = 522.044 CME 55 Truckrig Status added adde							INATES	11.								-
Challenge Engineering & Testing, Inc. 2006D30 12. TOTAL SAMPLES 33 0 4. MAME OF DRILLER Adam Benson Adam Benson 13. TOTAL NUMBER CORE BOXES 4 5. DIRECTION OF BORING Source Transmission VERTICAL BEARING 14. ELEVATION GROUND WATER 5.0 Ft. 5. DIRECTION OF BORING VERTICAL 15. DATE BORING 97ARTED COMPLETED 1. NOTAL NUMBER CORE BOXES 4 10-06-06 10-17-06 5. DIRECTION OF OVERBURDEN N/A 16. ELEVATION TOP OF BORING 17.5 Ft. 7. DEPTH DRILLED INTO ROCK N/A 18. SIGNATURE AND TITLE OF INSPECTOR Bob Momberger, Geologist 109.0 Ft. ELEV. DEPTH U CLASSIFICATION OF MATERIALS NEC. 00/00/00/00/00/00/00/00/00/00/00/00/00/	С	P06-L30P	P-CB-(0002	X = 823,	753	Y = 522,044									ŧ
Image Engineering & Testing, Inc. 1 2006030 133 10 Adam Benson 13. TOTAL NUMBER CORE BOXES 4 Adam Benson 14. ELEVATION GROUND WATER 5.0 Ft. Deventrical VERTICAL 10.06-06 10.17.06 S. DIRECTION OF BORING IVENTICAL 16. ELEVATION GROUND WATER 5.0 Ft. Depth DRILLED INTO ROCK 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. Bob Momberger, Geologist 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 109.0 Ft. Bob Momberger, Geologist 17.5 17.5 17.5 0.0 L-30 Levee Fill Material 17.5 17.5 17.5 17.5 0.0 L-30 Levee Fill Material 17.5 Advanced Boring						CONT	FRACTOR FILE NO.	42	TOT			EQ	DISTURBED	JNDISTUR	BED (UD))
Adam Benson 13. TOTAL HOMBER COME BOLES 4 5. DIRECTION OF BORING SVERTICAL INCLINED DEG. FROM VERTICAL 14. ELEVATION GROUND WATER 5.0 Ft. 13. THICKNESS OF OVERBURDEN N/A 15. BATE BORING 10-06-06 10-17-06 3. THICKNESS OF OVERBURDEN N/A 16. ELEVATION TOP OF BORING 17.5 Ft. 10-17-06 3. THICKNESS OF OVERBURDEN N/A 16. ELEVATION TOP OF BORING 17.7 Ft. 10-17-06 3. TOTAL DEPTH OF BORING 109.0 Ft. Bob Momberger, Geologist Bob Momberger, Geologist ELEV. DEPTH B CLASSIFICATION OF MATERIALS BC				ering & Tes	sting, Inc.	20	006D30	12.	1017	AL 3	AWP		33	0		
5. DEG_FROM VERTICAL DEG_FROM VERTICAL 14. LEVATION GROUND WATER 5.0 Ft. 11. NCLINED 15. DATE BORING 10-06-06 COMPLETED 10-06-06 10-17-06 3. THICKNESS OF OVERBURDEN N/A 16. ELEVATION TOP OF BORING 17.5 Ft. 17. 7. DEPTH DRILLED INTO ROCK N/A 16. ELEVATION TOP OF BORING 65 % 18. 8. TOTAL DEPTH OF BORING 109.0 Ft. 10.0 Ft. 18. SIGNATURE AND TITLE OF INSPECTOR Bob Momberger, Geologist ELEV. DEPTH 9 9 9 17.5 0.0 130 Levee Fill Material 17.5 17.5 0.0 L-30 Levee Fill Material 17.5 17.5 17.5 Advanced Boring Advanced Boring Advanced Boring								13.	тот		IUMB	ER CORE BOXES	4			
S. DIRECTION OF BORING VEEL FROM VERTICAL BEARING IS. DATE BORING STARTED COMPLETED INCLINED INCLINED INCLINED INCLINED IO-06-06 10-17-06 S. THICKNESS OF OVERBURDEN N/A IS. ELEVATION TOP OF BORING 17.5 Ft. IO-06-06 10-17-06 S. THICKNESS OF OVERBURDEN N/A IS. ELEVATION TOP OF BORING 17.5 Ft. IO-06-06 10-17-06 S. TOTAL DEPTH OF BORING 109.0 Ft. Bob Momberger, Geologist Bob Momberger, Geologist IS. STARTED STOR ELEV. DEPTH Output CLASSIFICATION OF MATERIALS No. IT.5 IT.5 IT.5 IT.50			-				1	14.	ELE\		ON G	ROUND WATER	5.0 Ft.			
Inclined 15. DATE BORING 10-06-06 10-17-06 A. THICKNESS OF OVERBURDEN N/A 16. ELEVATION TOP OF BORING 17.5 Ft. Z. DEPTH DRILLED INTO ROCK N/A 17. TOTAL RECOVERY FOR BORING 65 % B. TOTAL DEPTH OF BORING 109.0 Ft. Bob Momberger, Geologist 18. SIGNATURE AND TITLE OF INSPECTOR B. TOTAL DEPTH B. CLASSIFICATION OF MATERIALS REC. Structure Remarks Structure 17.5 0.0 Image: Structure Image: Structu			BORING	5	VERTICAL	MI.	BEARING						STARTED	COMPL	ETED	-
7. DEPTH DRILLED INTO ROCK N/A 17. TOTAL RECOVERY FOR BORING 65 % 3. TOTAL DEPTH OF BORING 109.0 Ft. Bob Momberger, Geologist ELEV. DEPTH Total Signature and Title OF INSPECTOR Bob Momberger, Geologist Bob Momberger, Geologist 17.5 0.0 L-30 Levee Fill Material Interview Interview Interview Interview Interview <								15.	DATI	EBC	RING	5	10-06-06	10-1	7-06	
7. DEPTH DRILLED INTO ROCK N/A 17. TOTAL RECOVERY FOR BORING 65 % 3. TOTAL DEPTH OF BORING 109.0 Ft. Bob Momberger, Geologist ELEV. DEPTH Total Signature and Title OF INSPECTOR Bob Momberger, Geologist Bob Momberger, Geologist 17.5 0.0 L-30 Levee Fill Material Interview Interview Interview Interview Interview <	6. ТНІС	KNESS OF	OVERB	URDEN	N/A			16.	ELE\	/AT	ΙΟΝ Τ	OP OF BORING	17.5 Ft.			
DEPTH DRLEED INTO ROCK TO/A B. TOTAL DEPTH OF BORING 109.0 Ft. Bob Momberger, Geologist ELEV. DEPTH B. CLASSIFICATION OF MATERIALS RC SC RC <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>17.</td><td>тот</td><td>AL R</td><td>ECO</td><td>ERY FOR BORIN</td><td></td><td></td><td></td><td>-</td></t<>								17.	тот	AL R	ECO	ERY FOR BORIN				-
Bot Momberger, Geologist Bot Momberger, Geologist elev. DePTH g CLASSIFICATION OF MATERIALS nec. g Rop Remarks g g 17.5 0.0 - - - 17.5 0.0 -	7. DEP	TH DRILLED		ROCK	N/A											-
ELEV. DEPTH O CLASSIFICATION OF MATERIALS No. No. REMARKS No. No. 17.5 0.0 - - - 17.5 -<	8. ТОТ	AL DEPTH C	F BOR	ING 10	9.0 Ft.											
17.5 0.0 17.5 17.5 17.5 1.30 Levee Fill Material 1.40 Levee Fill Material 17.5 1.30 Levee Fill Material 1.40 Levee Fill Material 17.5 1.40 Levee Fill Material 1.40 Levee Fill Material 17.5 1.40 Levee Fill Material 1.40 Levee Fill Material 17.5 1.40 Levee Fill Material 1.40 Levee Fill Material 17.5 1.40 Levee Fill Material 1.40 Levee Fill Material 17.5	ELEV.	DEPTH	EGEND	CL	ASSIFICATIO	ON OF	MATERIALS			_				BLOWS/	U.S FI.	
L-30 Levee Fill Material			╞╺┼						+					_		-
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		-		L-30 Leve		iai										E
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DRI	LLING	LOG	6 (Cont. Sheet)	INSTALLA Jackso		Dietr	ict		SHEET 2 OF 7 S	
PROJEC			- •					UM HORIZONTAL	VERTICAL	/NEE13
L-30	Seepage	Manag	gement Pilot Project	State I	Plane,	FLE	(U.S.	. Ft.) NAD83	NAVD88	
	ON COORD			ELEVATIO		OFE	BORIN	G		
X = 8	323,753	Y = 52	22,044	17.5 F	t.			-		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIA	ALS	RÉC.	BOX OR SAMPLE	RQD OR UD	REMA	RKS 018	N-VALUE
								Advance w/ tricon	d Boring e roller bit	
0.2	17.3			liforous				0.2		_
			LIMESTONE, oolitic, sparsely foss soft, moderately weathered, fine-gi thin bedding, vuggy, Ft. Thompson Formation, 2.5Y 8/2 pale yellow	ained,	81	1	RQD 20	4 x 5-1/2" Diamono DT = 1 HP = 2 DFR =	mins 50 psi	
-2.5	20.0		LIMESTONE, hard, moderately we fine-grained, thick bedding, pitted, 5Y 8/1 white At El4.0 Ft., 5Y 7/3 pale yellow	athered,				-2.5		
-5.5	23.0		LIMESTONE, fossiliferous, modera	ately hard, bedding,	100	2 BOX	RQD 85	4 x 5-1/2" Diamond DT = 4 HP = 2 DFR =	mins 50 psi	
	Clichtle, MAcadecond	ини и и и и и и и и и и и и и и и и и и	At El9.5 Ft., thin bedding, 5Y 8/1	-	60	1	RQD 10	-7.5 4 x 5-1/2" Diamond DT = 3 HP = 2 DFR =	mins 50 psi	
-12.5	30.0		SAND, silty, soft, mostly subangula fine-grained sand-sized carbonate, reaction with HCI, wet, 2.5Y 8/2 pa (SM)	strong				-12.5		
-14.5	32.0		LIMESTONE, fossiliferous, modera moderately weathered, fine-grained bedding, vuggy, 5Y 8/1 white		60	вох 2	RQD 0	4 x 5-1/2" Diamond DT = 4 HP = 2 DFR =	mins 50 psi	
			At El17.0 Ft., 5Y 6/4 pale olive					-17.5		

DR	ILLING	LOC	G (Cont. Sheet)	INSTALL)6-L30PF	SHEET 3	
PROJEC				Jacks COORDIN	onville			им	HORIZONTAL	Ve	OF 7 SI	IEETS
		/lanag	gement Pilot Project		Plane,				NAD83		NAVD88	
	ON COORDII			ELEVATI				•		•		
X = 8	823,753	Y = 5	22,044	17.5	=t.							
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATER	ALS	RÉC.	BOX OR SAMPLE	RQD OR UD		RE	MARKS	BLOWS/ 0.5 FT.	N-VALUE
	Moderately Weathered		ົ∽From El20.5 to -31.5 Ft., unwea aphanitic, thin bedding, pitted, 5Y	thered, 8/1 white	60	5	RQD 25	-22.5	HP =	ond Impreg = 3 mins = 250 psi ₹ = 0 %	nated Bit	
					60	вох	RQD	4	HP =	ond Impreg = 5 mins = 250 psi R = 0 %	nated Bit	
	Unweathered		➤From EI31.5 to -37.5 Ft., soft, unweathered, aphanitic, thin bedd clay filled pits	ing, pitted,	66	7	RQD 0	4	HP =	ond Impreg = 5 mins = 250 psi R = 0 %	nated Bit	
	Unweathered				60	вдх	RQD 25	<u>-32.5</u> 4 -37.5	HP =	ond Impreg = 6 mins = 250 psi ₹ = 0 %	nated Bit	

SAJ FORM 1836-A JUN 02

DR	ILLING	LOG	G (Cont. Sheet)	INSTALLA					SHEET 4	
ROJEC				Jackso COORDIN					OF 7 S	HEETS
		Manag	gement Pilot Project	State				1	NAVD88	
OCATI	ON COORDI	NATES	5	ELEVATIO	он тор	OF E	ORIN	G	÷	
X = 8	823,753	Y = 52	22,044	17.5 F	t.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIA	ALS	RÉC.	BOX OR SAMPLE	RQD OR UD	REMA	NKS 020 5 FT.	N-VALUE
	Mod. Weathered		From El37.5 to -39.5 Ft., moderate moderately weathered, aphanitic, t bedding, vuggy, 5Y 7/2 light gray	hin			RQD	4 x 5-1/2" Diamon DT = 4		
	Unweathered		unweathered, aphanitic, thin beddi clay filled pits, 5Y 8/1 white	ng, pitted,	25	9	0	-42.5	50 psi	
			From El43.5 to -46.0 Ft., modera moderately weathered, aphanitic, t bedding, vuggy, sand filled vugs, 5 yellow From El46.0 to -51.5 Ft., modera weathered, aphanitic, thin bedding, clay filled pits, 10YR 7/2 light gray	hin Y 7/3 pale tely	20	вдух	RQD 0	4 x 5-1/2" Diamon DT = 6 HP = 2 DFR =	6 mins 50 psi	
	- Modectatesijesijy Akidestherded		✓From El51.5 to -55.5 Ft., unweatl aphanitic, medium bedding, vuggy, filled vugs, 10YR 8/2 very pale brow	sand	80	11	RQD 8	-47.5 4 x 5-1/2" Diamon DT = 6 HP = 2 DFR =	6 mins 50 psi	
	d: Weathered		From El55.5 to -57.5 Ft., modera weathered, fine-grained, thick bedo pitted, sand filled pits, 2.5Y 6/1 gra	ding,	90	врх	RQD 60	4 x 5-1/2" Diamon	3 mins 50 psi	

SAJ FORM 1836-A JUN 02

DRI	LLING	LOC	G (Cont. Sheet)	INSTALLA		Dict	ict			SHEET S	
PROJEC			. ,	Jackso COORDIN				UM	HORIZONTAL	VERTICAL	MEETS
	-	Manag	gement Pilot Project	State					NAD83	NAVD88	
	ON COORD	INATE	S	ELEVATIO	ON TOP	OF B	ORIN	G			
X = 8	323,753	Y = 5	22,044	17.5 F	t.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERI	ALS	RÉC.	BOX OR SAMPLE	RQD OR UD		REMARKS	BLOWS/	N-VALUE
64 E	Slichtly Waathered		LIMESTONE, soft, slightly weathe aphanitic, 5Y 7/3 pale yellow	red,	0	вдх 4	RQD 0		4 x 5-1/2" Diamond Im DT = 2 mir HP = 250 p DFR = 0 %	ns osi	
-61.5	79.0		LIMESTONE, fossiliferous, soft, sl					-61.5		WOF	
00.5			weathered, aphanitic, pitted, sand 5Y 7/3 pale yellow	filled pits,	20	14			SPT Sampl		<u> </u>
-62.5	80.0	1	SHELL, mostly angular coarse-gra	ained	- 20	'			or i dampi	0	0
		> >> > > >> >	sand-sized shell up to 1/2", little cla reaction with HCI, wet, Pinecrest S					-63.0		7	_
		> >> > > >> >	Formation, 2.5Y 7/1 light gray	ballu		45					_
		> >> > > >> >			40	15			SPT Sampl		23
			At El64.5 Ft., some coarse grave	al-sized				-64.5		11	_
			limestone up to 1"	51-31260						7	_
		ר ככ כ			97	16			SPT Sampl	ler <u>14</u>	28
		> >> > > >> >						-66.0		14	20
		> >> > > >> >								8	
					73	17			SPT Sampl	ler 17	
		> $>>$ $>$						67 F		16	- 33
		> >> > > >> >						-67.5		7	
))))))))			100	10			CDT Compl		_
-68.5	86.0	>>>>>	SAND, clayey, nonplastic, soft, mo	ostlv	100	18			SPT Sampl		16
			fine-grained sand-sized carbonate	, little clay,				-69.0		8	
			strong reaction with HCl, wet, 2.5Y	7/1 light						12	
-70.0	87.5		gray (SC)		50	19			SPT Sampl	ler 14	
		D D D D D D D D	SHELL, mostly angular coarse-gra	ained	1			-70.5		15	29
		ר ככ כ	sand-sized shell up to 1/4", some coarse-grained sand-sized limesto				1			12	
))))))))	1/2", little clay, strong reaction with		77	20			SPT Sampl		
		> >> > > >> >	2.5Y 6/1 gray		1''	[12 14	26
		> >> > > >> >			<u> </u>	<u> </u>		-72.0			_
											_
		ר ככ כ			90	21			SPT Sampl		18
		>>>>						-73.5		10	
))))))))	At El73.5 Ft., nonplastic, mostly medium-grained sand-sized shell							10	
-74.5	92.0	> >> > > >> >	little fine to medium-grained sand-	sized	90	22			SPT Sampl	ler 8	
		\overline{V}	carbonate, strong reaction with HC	ز, wet,	1			-75.0		7	15
			CLAY, lean, medium plasticity, sof					10.0		5	
			clay, some shell up to 1/4", little fir sand-sized carbonate, strong reac		90	23			SPT Sampl		-
			HCl, wet, 2.5Y 5/1 gray (CL)		30	23			or i Sallipi		14
		V/	At El76.5 Ft., some fine-grained					-76.5		7	_
		V//	sand-sized quartz, little coarse-gra		90	24			SPT Sampl	ampler <u>6</u>	
			sand-sized shell, strong reaction w							5	

DRI	LLING	LO	G (Cont. Sheet)	INSTALLA		D ¹ · ·				SHEET 6]		
PROJEC				Jackso COORDIN				им	HORIZONTAL	OF 7 S	HEETS	4		
		Mana	gement Pilot Project	State F		NAVD88								
	ON COORD		· · ·	ELEVATIO	ELEVATION TOP OF BORING									
X = 8	323,753	Y = 5	22,044	17.5 F	t.		_							
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATER	RIALS	RÉC.	BOX OR SAMPLE	RQD OR UD		REMARKS	BLOWS/ 0.5 FT.	N-VALUE			
		V//	wet, 10Y 6/1 greenish gray		90	24		-78.0	SPT Sampl	er 5	10	-		
-78.5	96.0	V//					1			15		Ŧ		
			SAND, silty, very soft, mostly fine sand-sized quartz, little silt, little	-grained	67	25			SPT Sampl	er 15	٦	F		
		:+:+	coarse-grained sand-sized shell u					-79.5		8	23	F		
			strong reaction with HCl, wet, 10' greenish gray (SM)	Y 7/1 light			1			7		Ŧ		
					47	26			SPT Sampl	er 14	-	F		
-81.0	31.0 98.5							-81.0		14	28	-		
-01.0	90.5	> >> > > >> >	SHELL, mostly angular fine to co					-01.0		7		╞		
			fine-grained sand-sized quartz lit		90	27			SPT Sample		-	-		
		>>>>	gravel-sized limestone up to 1/2",	, few silt,		_ .		00 F		21	- 35	E		
))))))))		Y 7/1 light				-82.5		21		╈		
)))))))	At El82.5 Ft., few fine-grained s	sand-sized	90	28			SPT Sampl		-	-		
			'		90	20			SFT Sampi		44	F		
								-84.0		21	-	Ŧ		
										12	-	F		
			At El85.0 Ft., some fine to med	ium-arained	90	29			SPT Sampl		20	F		
		>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	sand-sized quartz, trace sand to					-85.5		9	_	ŧ		
										5	_	È		
		Þ >> >			90	30			SPT Sampl	er 10	20	E		
		>>>>						-87.0		10		╞		
-87.5	105.0	>>>>								17		F		
			SAND, silty, some fine-grained sa guartz, little fine-grained sand-siz		90	31			SPT Sampl	er <u>23</u>	65	ŀ		
			carbonate, little sand to gravel-size to 1/2", strong reaction with HCl,					-88.5		42	05	-		
			10Y 6/1 greenish gray (SM)	-						27		ŀ		
			^L At El88.5 Ft., few coarse-graine sand-sized limestone up to 1/4"	ed	90	32			SPT Sampl	er 37	│	F		
								-90.0		37	74	-		
		 + <u>†</u> + <u>†</u>								14		F		
					97	33			SPT Sampl	er 34	┨	F		
-91.4	168.8							-91.5		37	71	F		
0.10		+++	LIMESTONE, fossiliferous, mode coarse-grained, pitted, clay filled						ammer w/30" drop use	ad with		╞		
			10Y 6/1 greenish gray	- ····,	1				it spoon (1-3/8" I.D. x			ŧ		
			NOTES:		1			Abbrevi	iations:			F		
			1. Soils are field visually classifie	ad in				WOR	= Weight of Rods.			F		
			accordance with the Unified Soils		1			HP =	Drill Time. Hydraulic Pressure.			F		
			Classification System.		1			DFR	= Drill Fluid Return.			F		
	2. Set 17.5 Ft. of 8" Schedule 40 Through Center of L-30 Levee To Rock.											F		
			 Boring Drilled/Sampled In Thread A. Set Surface Casing. B. 4" Wireline Rock Coring To Ba C. Splitspoon Sampling 30 Ft. Be Rock. 	se Of Rock.										
		1												

DRILLING	LO	G (Cont. Sheet)	INSTALLA	SHEE	T 7 Sheets								
ROJECT		•	Jacksonville District OF 7 COORDINATE SYSTEM/DATUM HORIZONTAL VERTICAL										
	Mana	gement Pilot Project	State Plane, FLE (U.S. Ft.) NAD83 NAVD88										
OCATION COORD			ELEVATION TOP OF BORING										
X = 823,753	Y = 5	22,044	17.5 F	_									
ELEV. DEPTH	LEGEND	CLASSIFICATION OF MATERI	ALS	RÉC.	BOX OR SAMPLE	RQD OR UD	REM	ARKS	0.5 FT.				
SAJ FORM 18		 Borehole Reamed To 7.5" To E Rock. USGS Performed Borehole 2" Monitoring Well Set @ X = 823754 Y= 522036 Screen From -40.7 to -42.7 Ft. Cored to 80 Ft. To Confirm Out 7. Boring sealed with available se 	Logging.										

CPO6-L30PP-CB-OODA DEPTH: 173-200 Run#1

CPO6-L30PP-CB-0002 DEPTH: 200-250 S-Run#2

CPO6-L30PP-CB-0002 DEPTH: 250-300 S-Run #3

CPO6-L30PP-CB-0002 DEPTH: 30.0-35.0 S-Run # 4

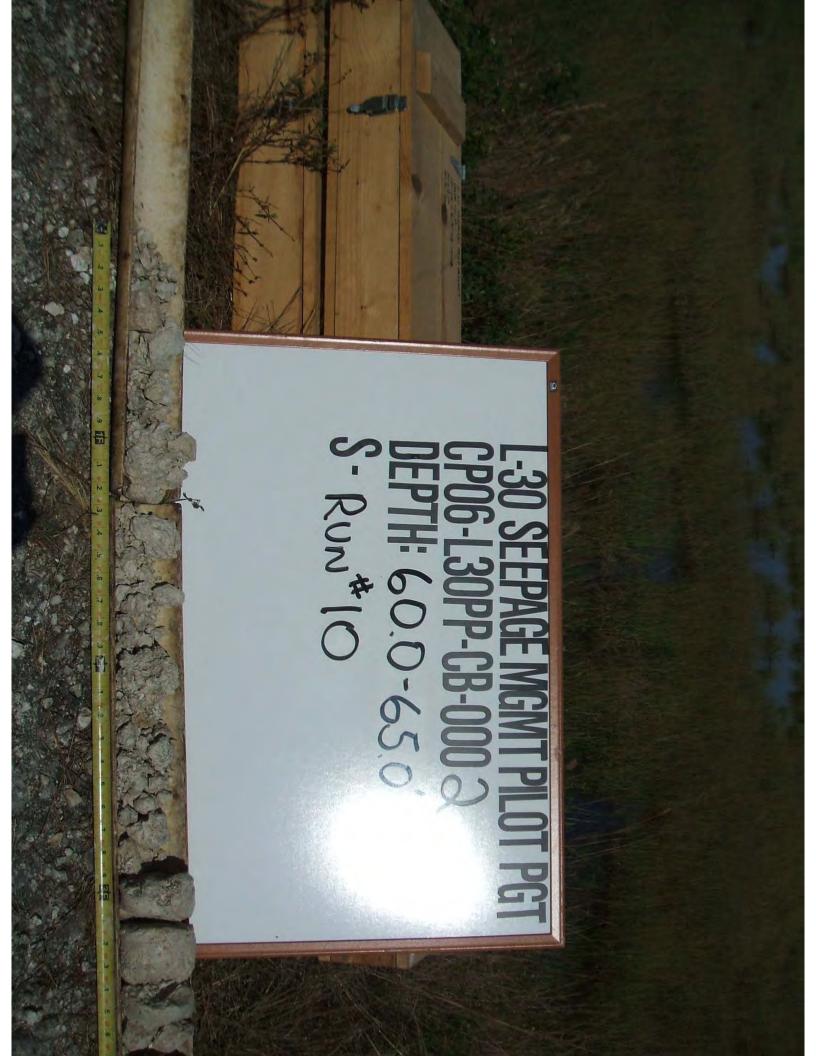
S-Run #5

CPO6-L30PP-CB-000 a DEPTH: 40.0-45.0 Run#6

CPO6-L30 SEEPAGE MGMT PLOT PGT DEPTH: 45.0-50.0 S- RUN*7

S-Run#8

CPOG-L30PP-CB-0002 DEPTH: 55.0-60.0 S- Run # 9



CPO6-L30PP-CB-0002 DEPTH: 65-70.0 S-Run * 1

S-RUN#12 S-RUN#12

CP06-L30PP-CB-000 a **DEPTH:** 79.0-80.2' S-14

BAGS 33 GALLON

-30 SEEPA CP P06-L Eblin: 80.2-8300 9 G AT PILOT PG

CPO6-L30PP-CB-000 a DEPTH: 82.0-83.5 5

CPO6-L30PP-CB-000 a DEPTH: 83.5-85.0

S-18 S-18

CPO6-L30PP-CB-000 a DEPTH: 86.5-88.0 S-19

CPO6-L30PP-CB-000 2 DEPTH: 88 0-095 20

CPO6-L30PP-CB-000 2 DEPTH: 89.5-910 j

CPOG-L30PP-CB-000 a DEPTH: 910-93.5' ·Ja

CPOG-L30PP-CB-000 a DEPTH: 92.5-94.0 S-23

CPOG-L30PP-CB-000 2 DEPTH: 94.0-955 2F

CPOG-L30PP-CB-000 2 DEPTH: 95.5-970 ц. . ЗС

CPO6-L30PP-CB-000 a DEPTH: 97.0-98.5' 20

CPO6-L30PP-CB-000 2 DEPTH: 98.5-100.0 2

CPO6-L30PP-CB-000 2 DEPTH: 101-5-103.0 200



CPOG-L30PP-CB-000 2 DEPTH: 1030-1045 30

CPO6-L30PP-CB-000 a DEPTH: 104.5-106.0 Ú

CPO6-L30PP-CB-000 a DEPTH: 106.0-107.5

CPO6-L30PP-CB-000 a DEPTH: 107.5-109.0 ろう

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

Miami-Dade County, Florida

DRILLING LOG South Attentic				DIVISIO	N			INST			.g _ co.gac		SHEET		
1. PROJECT L-01 Seepage Management Pilot Project T-0 Of Leven L-30 (Seepage Management Pilot Project T-0 Of Leven L-30 (Center of Rendwy) 2. Bolluke Assertion J. L-20 (Seepage Management Pilot Project T-0 Of Leven L-30 (Center of Rendwy) Contractor of Contractor Pilot R- Contractor R- Contractor R- Contractor R- Contractor R- Contractor R- Contractor R	DRI	LLING	LOG								listrict		-		s
L-30 Sengage Management Pilot Project 10. COORDINATE SYSTEMDATINI HORIZONTAL VENTERDATINI FORIZONTAL VENTERDATION CONCENTRATES INAVIORAL MANDER 2. BORING DESIGNATION I LOCATION COORDINATES INAVIORAL MANDER INAVIORAL MANDER 2. BORING DESIGNATION I LOCATION COORDINATES CME 55 Trucking INAVIORAL MANDER 3. PRILINA AGENEY COORTACTOR FLA ION INAVIORAL MANDER 3. PRILINA AGENEY COORTACTOR FLA ION INAVIORAL MANDER Challenge Engineering & Tosting, Inc. 2006030 13. TOTAL MUNDER CORE BOXES 5 Adam Borson 13. TOTAL MUNDER CORE BOXES 5 INAVIORAL MANDER Challenge Engineering & Tosting, Inc. 2006030 14. ELEVATION GOUND WATER 5.0 FL Challenge Engineering & Tosting, Inc. 2006030 14. ELEVATION GOUND WATER 5.0 FL Challenge Engineering & Tosting, Inc. 2006030 14. ELEVATION GOUND WATER 5.0 FL Challenge Engineering & Tosting, Inc. 100.07.06 10.018-06 10.018-06 Challenge Engineering & Tosting, Inc. 105.0 FL 15. DATE BORING 17.2 FL 17. TOTAL MUNDER CORE TORNO Challenge Engineering & Calassification OP MATERIALS 16. DATE BORING 17.2 17.2 TOTAL DEPTH OF DERME L-30 LEVENE FII Material 17.2 17.2 Advanced Boring I I	1. PRO	JECT		1 000				_				e Remarks	- 3		4
Top Of Larver L-30 (Center of Read-way) Sites Plane, FLE (U.S. F.): NA083 NAV088 CONING GESENATON OPEL-30PP-CB-000 X = 821,358 Y = 619,731 CAMPACE STRUE DESENATION OF DILL OME 55 Truckrig JUND HAMBER OF DILL OME 55 Truckrig JUND HAMBER OF DILL STRUE DESENATION OF DILL STRUE DESENATION OF DILL STRUE DESENATION OF DILL STRUE DESENATION OF DILL OME 55 Truckrig JUND HAMBER OF DILL STRUE DESENATION OF DILL DILLERA ANALE ANALES JUND HAMBER OF DILL STRUE DESENATION STRUE DESENATION OF DILL STRUE DESENATION OF DILLERA STRUE DESENATION STRUE DESENATION OF DILLERA STRUE DESENATION STRUE DESENATION OF DILLERA STRUE DESENATION STRUE DESENATION STRUE DESENATION STRUE DESENATION STRUE DESENATION STRUE DESENATION OF DILLERA STRUE DESENATION STRUE DESENATION STRUE DESENATION STRUE DESENATION STRUE DESENATION STRUE DESEN	1.	-30 Seena	ae Mai	nagement	Pilot Proiec	t							VERTIC	AL	+
2. BORNO CEBIGNATION I LOCATION COORDINATES CPOBLOPPC-LEN003 X = B21,385 ¥ = 519,743 3. BORLINA AGENERY Challange Engineering & Testing, Inc. 2006030 4. MARE OT DELLER Adam Benson 5. DIRECTION OF BORLING 1. TOTAL BAMPLES 33 0 4. MARE OT BORNO 5. DIRECTION OF BORLING 1. TOTAL BAMPLES 33 0 4. MARE OT BORNO 5. DIRECTION OF BORLING 1. TOTAL BAMPLES 5. 5. CHALLER Adam Benson 5. DIRECTION OF BORLING 1. TOTAL BAMPLES 5. 5. CHALLER Adam Benson 5. DIRECTION OF BORLING 1. TOTAL BENERO 1. TOTAL BENERO 1. TOTAL BENERO 1. TOTAL DEPTH OF BORLING 1. TOTAL DEPTH OF BORLING 1. TOTAL DEPTH OF BORLING 1. TOTAL DEPTH OF BORLING 1. 200 LEVERO FOR BORLIN												1	1		
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Challenge Engineering & Testing, Inc. 1 2006D30 12. TOTAL SAMPLES 33 0 Add of Banson 13. TOTAL NUMBER CORE SORES 5 -	С	P06-L30P	P-CB-(0003	X = 821,	358	Y = 519,743								:
L. Unlikery						CONT	RACTOR FILE NO.	42 7		SAMD		DISTURBED U	NDISTUR	BED (UD))
Adam Benson Is. 10-47-00-800-800-30-3 3 EDERCTION OF BORING DESC. FROM BEARING 14. ELEVATION BORING 5.0 Ft. 16. TOTAL RECOVERY FOR BORING 10-17-00. COMPLETER 10-17-00. 10-17-00. 8. THICKNESS OF OVERBURGEN N/A 15. ELEVATION TOP OF BORING 17.2 Ft. 7. DEPTH BILLED INTO ROCK N/A 18. ELEVATION TOP OF BORING 17.2 N. 8. TOTAL RECOVERY FOR BORING 105.0 Ft. 10.61.000. 10.61.000. 8. TOTAL RECOVERY FOR BORING 105.0 Ft. 10.61.000. 10.61.000. 8. TOTAL RECOVERY FOR BORING 10.5.0 Ft. 10.61.000. 10.61.000. 8. TOTAL RECOVERY FOR BORING 10.5.0 Ft. 10.61.000. 10.61.000. 17.2 0.0 10.5.0 Ft. 10.61.000. 10.7.2 17.2 0.0 1.30 Levvee Fill Material 10.1.000. 17.2 10.1.000. 17.2 0.0 1.30 Levvee Fill Material 10.1.000. 17.2 10.1.000. 17.2 1.30 Levvee Fill Material 10.1.000. 10.1.000. 10.1.000. 17.2 1.30 Le				ering & Tes	sting, Inc.	20	06D30	12.	UTAL	SAMP	LES	33	0		
B. DIRECTION OF BORING DRE. PROM WENTCAL IBEARING 14. ELEVATION GROUND WATER 5.0 FL. COMPLETED 10.000 Line 10.000 Line <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>13. 1</td><td>OTAL</td><td>NUMB</td><td>ER CORE BOXES</td><td>5</td><td></td><td></td><td></td></t<>								13. 1	OTAL	NUMB	ER CORE BOXES	5			
BETTER INTO OF BORING USER LEX/IN ELANING IMPLINED INTO ANSE OF OVERBURGEN N/A 16. DATE BORING 17.2 FL. 17. DEPTH DRILLED INTO ROCK N/A 18. TOTAL RECOVERY TOR BORING 17.2 FL. 18. SIGALWARE AND TILE OF RESERCTOR 17. DEPTH B CLASSFICATION OF MATERIALS 17.2 0.0 17.2 0.0 17.2 0.0 17.2 0.0			-	-			1	14.			ROUND WATER	5.0 Ft.			
Imachanes Imachanes <thimachanes< th=""> Imachanes <thimachanes< th=""> Imachanes Imachanes</thimachanes<></thimachanes<>			BORING)	DEG. FRO	M	BEARING						COMPL	ETED	-
V. DEPTH ORILLED INTO ROCK N/A 17. TOTAL RECOVERY FOR BORING 73 % B. TOTAL DEPTH OF BORING 105.0 FL BioMartue And Data Data Data Data Data Data Data Dat								15. [ATE B	ORING	3	10-07-06	10-1	8-06	
V. DEPTH ORILLED INTO ROCK N/A 17. TOTAL RECOVERY FOR BORING 73 % B. TOTAL DEPTH OF BORING 105.0 FL BioMartue And Data Data Data Data Data Data Data Dat	6. ТНІС	KNESS OF	OVERB	URDEN	N/A		•	16. 1		τιοη τ	OP OF BORING	17.2 Ft.			
John Banklad Jirl Market Singer, Geologist a. Total Depth of Borning 172 0.0 172 0.0 173 1.30 Levee Fill Material 174 1.30 Levee Fill Material 175 1.30 Levee Fill Material								17. 1	OTAL	RECO	VERY FOR BORIN				-
Both Company DepTrin Use Description Descripion Description Descr	7. DEP	TH DRILLED) INTO	ROCK	N/A										-
ELEV. DEPTH 83 CLASSIFICATION OF MATERIALS Nec. 85 80 REMARKS 84 V 17.2 0.0 -	8. тот	AL DEPTH C	OF BOR	ing 10	5.0 Ft.										
17.2 0.0 L-30 Levee Fill Material L-30 Levee Fill Material Advanced Boring w/ tricone roller bit	ELEV.	DEPTH	EGEND	CL	ASSIFICATI	ON OF	MATERIALS	RE					STOWS/	-VALUE	
L-30 Levee Fill Material			┝┛┝					_						z	-
Advanced Boring withione roller bit	17.2	0.0									17.2				
v / tricone roller bit	ŀ	-		L-30 Leve	ee Fill Mate	rial									ŀ
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DR	ILLING	LOC	G (Cont. Sheet)	INSTALLA					nation CP06-L	SHEET 2	
		(Jackso					!	OF 6 S	HEETS
PROJEC L-30		Manao	gement Pilot Project	COORDIN State					HORIZONTAL NAD83	VERTICAL NAVD88	
	ON COORDI		-	ELEVATIO					1		
X =	821,358	Y = 5	19,743	17.2 F	t.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATER	ALS	RÉC.	BOX OR SAMPLE	RQD OR UD		REMAR	S BLOWS/ 0.5 FT.	N-VALUE
									Advanced I w/ tricone	Boring	
-0.3	17.5		LIMESTONE, oolitic, sparsely foss moderately hard, slightly weathere fine-grained, thick bedding, vuggy vugs, Ft. Thompson Formation, 2.5Y 8/2 pale yellow	d, , peat filled	100	1	RQD 50	-0.3 4 -2.8	x 5-1/2" Diamond I DT = 3 n HP = 250 DFR = 5	nins) psi	
			 At El2.8 Ft., vuggy, quartz filled From El4.3 to -12.8 Ft., aphaniti bedding, pitted, sand filled pits, 2.9 gray At El6.8 Ft., pitted, clay filled pits 	c, thick 5Y 7/2 light	100	2 BOX 1	RQD 30	-7.8	x 5-1/2" Diamond I DT = 6 n HP = 250 DFR = 2	nins) psi	
-12.8	30.0				70	3	RQD 45		x 5-1/2" Diamond I DT = 5 n HP = 250 DFR = 0	nins) psi	
-12.8	30.0		LIMESTONE, fossiliferous, very so weathered, aphanitic, thin bedding clay filled vugs, 2.5Y 8/1 white	oft, slightly , vuggy,	6	BOX 2 4	RQD		x 5-1/2" Diamond I DT = 3 n HP = 250 DFR = 0	nins) psi	

SAJ FORM 1836-A JUN 02

DR	ILLING	LOC	G (Cont. Sheet)	INSTALLA Jacks		Distr	rict		SHEET 3 OF 6 SHEETS
PROJEC	т			COORDIN				UM HORIZONTAL	VERTICAL
L-30	Seepage I	Mana	gement Pilot Project	State	Plane,	FLE	(U.S.	. Ft.) NAD83	NAVD88
	ON COORDI			ELEVATIO		OF E	BORIN	G	
X = 8	821,358		19,743	17.2 F	t.	-	-		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATER	RIALS	RÉC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT. N-VALUE
			At El17.8 Ft., sparsely fossilifero moderately hard, slightly weather aphanitic, thick bedding, pitted At El21.8 Ft., fossiliferous	ous, ed,	90	5	RQD 50	4 x 5-1/2" Diamond Imp DT = 4 mins HP = 250 ps DFR = 0 % -22.8	i l
			NAt El25.8 Ft., soft, vuggy, clay f	illed vugs	96	BOX 2	RQD 20	4 x 5-1/2" Diamond Imp	s i
	Inweathered		At El27.3 Ft., moderately hard, unweathered, aphanitic, medium vuggy, sand filled vugs, 5Y 8/1 wl	bedding, hite	70	7	RQD 20	-27.8 4 x 5-1/2" Diamond Imp DT = 3 mins HP = 250 ps DFR = 0 %	i l
					90	BOX 3	RQD 25	4 x 5-1/2" Diamond Imp DT = 4 mins HP = 250 ps DFR = 0 %	i l

SAJ FORM 1836-A

DRI	ILLING	LOC	G (Cont. Sheet)	INSTAL Jack	LATION sonville	Distr	ict				SHEET OF 6	4 Sheets
PROJEC	т			COORDI				им	HORIZO	NTAL	VERTICAL	
L-30	Seepage N	Mana	gement Pilot Project	State	Plane,	FLE	(U.S.	Ft.)	NAD	83	NAVD8	8
	ON COORDI			ELEVAT		OF E	BORIN	G				
X = 8	321,358		19,743	17.2	Ft.							
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATER	RIALS	RÉC.	BOX OR SAMPLE	RQD OR UD			REMARKS	BLOWS	0.5 FT. N-VALUE
	Slightly Weathered		At El37.8 Ft., slightly weathered 2.5Y 8/1 white	d, pitted,	70	9 BOX 3	RQD 20	-42.8	4 x 5-1/2" [Diamond Im DT = 2 mir HP = 250 p DFR = 0 %	osi	it
-44.8	62.0		LIMESTONE, hard, unweathered 2.5Y 6/1 gray	, pitted,	80	10	RQD 20		4 x 5-1/2" [Diamond Im DT = 7 mir HP = 250 p DFR = 0 9	osi	it
-49.8	67.0 Moderately Weathered		At El47.8 Ft., moderately weath bedding, vuggy, clay filled vugs		40	11 BOX 4	RQD	<u>-47.8</u> 4	4 x 5-1/2" [Diamond Im DT = 2 mir HP = 250 p DFR = 0 9	osi	it
-54.8	72.0	I I	SHELL, mostly angular sand to g shell up to 1/2", few fine-grained carbonate, trace limestone up to reaction with HCI, wet, 5Y 7/1 ligl	sand-sized 1/8", strong	20	12	RQD 0		4 x 5-1/2" [Diamond Im DT = 1 mir HP = 250 p DFR = 0 %	osi	it
)))))))))	At El57.1 Ft., little fine-grained carbonate, Pinecrest Sand Formate	sand-sized ation				-57:8				

SAJ FORM 1836-A JUN 02

DR	ILLING	LO	G (Cont. Sheet)	Jackso		Distr	ict			SHEET 5 OF 6 SI	HEETS
PROJEC	т				COORDINATE SYSTEM/DATUM HORIZONTAL						
L-30	Seepage	Mana	gement Pilot Project	State F	Plane,	FLE	(U.S.	Ft.)	NAD83	NAVD88	
	ON COORD			ELEVATIO		OF E	BORIN	G			
X = 8	321,358	1	19,743	17.2 F	t.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIA	ALS	RÉC.	BOX OR SAMPLE	RQD OR UD		REMARKS	BLOWS/ 0.5 FT.	N-VALUE
		>>>				13	RQD	4	x 5-1/2" Diamond Imp	pregnated Bit	
		>>>:			67	14			SPT Sample	er 2	-
))) ;))) ;						50.0		2	4
		> >> : > >> :))					-59.3		3	
		> >> : > >> :			73	15					-
					13	15			SPT Sample		6
								-60.8		4	
										3	_
		þ >> :			73	16			SPT Sample		5
				1 				-62.3		3	
		>>>:	gravel-sized shell up to 1/2", few sil	to coarse						7	
))) ;))) ;	clay, strong reaction with HCl, wet,		47	17			SPT Sample	er <u>6</u>	12
			10Ý 6/1 greenish gray					-63.8		6	12
										5	
					97	18			SPT Sample	er 4	1
-65.3	82.5							-65.3		7	11
00.0	02.0		SAND, silty, mostly fine-grained sa		100	19		-65.6	SPT Sample	er <u>50/0.3</u> '	
-66.8	84.0		carbonate, little angular sand to gra shell up to 1/2", few sandstone, stro reaction with HCI, wet, moderate cementation, N 6/ gray (SM)					-66.8	Advanced Bo	ring	
00.0	04.0	2 22 3	SHELL, low plasticity, mostly angul	ar sand to				00.0		14	
		>>>:	gravel-sized shell up to 1/2", little cl silt, strong reaction with HCl, wet,	ay, few	90	20			SPT Sample	er 14	1
			10Y 6/1 greenish gray						e : • e ap.	17	31
))) ;))) ;						-68.3		9	
					53	21					-
		> >> : > >> :			55	21			SPT Sample		40
								-69.8		21	
)))])))]	gravel-sized shell up to 3/4", few sil							19	-
			reaction with HCI, wet, 101 6/1 gree	enisn gray	80	22			SPT Sample		48
								-71.3		26	
										22	-
		p ∞ :			90	23			SPT Sample		38
-72.8	90.0))) ;))) ;	CAND alter marking "	4				-72.8		17	
			SAND, silty, mostly medium-graine sand-sized quartz, some angular							11	
			medium-grained sand-sized shell u	p to 1/4",	97	24			SPT Sample	er 12	27
		┨┤┤┤	strong reaction with HCl, wet, N 6/ (SM)	yıay	L			-74.3		15	
										14	
					97	25			SPT Sample	er 14	1_
					1			-75.8		14	28
								-15.0		9	
					97	26			SPT Sample		1
		 			 ''				or i oampie	7	13
		┨╢╢				07		-77.3			
	ORM 18				67	27			SPT Sample	er 8	

SAJ FORM 1836-A JUN 02

DRILLING LOG (Cont. Sheet)					INSTALLATION Jacksonville District							IEETS
PROJECT				COORDINATE SYSTEM/DATUM HORIZONTAL V								
L-30 Seepage Management Pilot Project				State	Plane,	, FLE	(U.S	. Ft.)	NAD83	N/	AVD88	
				ELEVATIO		POFE	BORIN	G				
X = 8	321,358	1	519,743 T	17.2 F	t.							ш
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATI		RÉC.	BOX OR SAMPLE	RQD OR UD		REMAR	RKS	BLOWS/ 0.5 FT.	N-VALUE
			At El77.8 Ft., some angular sa gravel-sized shell up to 1/2", tra reaction with HCl, wet, N 6/ grav	ce silt, strong	67	27		-78.8	SPT Sa	mpler	5 6	- 11
			At El78.8 Ft., some angular sa gravel-sized shell up to 1"	and to	97	28			SPT Sa	mpler	2	
					-			-80.3			7	- 10
					97	29		04.0	SPT Sa	mpler	25 23	48
			At El81.8 Ft., little angular me sand-sized shell up to 1/4", stro with HCl, wet, N 6/ gray	dium-grained	97	30	-	-81.8	SPT Sa	mpler	12 20	-
			At El83.3 Ft., some angular sa	and to			-	-83.3			27	47
			gravel-sized shell up to 1"		93	31			SPT Sa	mpler	26	- 54
			At El84.8 Ft., some angular sa gravel-sized shell up to 1-1/2"	and to	70	32		-84.8	SPT Sa	mplor	15 26	_
			At El86.3 Ft., little angular sar	nd to			-	-86.3			13 6	- 39
-87.8	105.0		gravel-sized shell up to 1/2", we cementation, 10Y 7/1 light greet		73	33		-87.8	SPT Sa	mpler	7	15
-07.0	105.0		NOTES:					140# ha	ammer w/30" drop t spoon (1-3/8" I.D			
			1. Soils are field visually classif accordance with the Unified Soi Classification System.						ations: Drill Time. Hydraulic Pressui	~		
			2. Set 17.5 Ft. of 8" Schedule 4 Through Center of L-30 Levee 7 Rock.						= Drill Fluid Return			
			 Boring Drilled/Sampled In Th A. Set Surface Casing. B. 4" Wireline Rock Coring To E C. Splitspoon Sampling 30 Ft. E Rock. 	Base Of Rock.								
			4. Borehole Reamed To 7.5" To Rock. USGS Performed Boreho									
			5. 2" Monitoring Well Set @ X = 821356 Y= 519734									
			Screen From -41.8 to -43.8 Ft.									
			 6. Cored to 80 Ft. To Confirm C 7. Boring sealed with available 									
				countent.								
	ORM 18	26 /	1 \			1	I	l				1

S-Run#175-200 S-

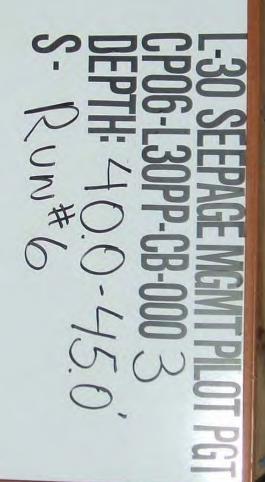
CPOG-L3OPP-CB-COOL DEPTH: 200-250 S-Runt 200-250

TUN

S-Run#3 S-Run#3 S-Run#3

S- Run *4

S- Run*5 S- Run*5



TU

TU

S-Rum*7 S-Rum*7



S- Run * 9 S- Run * 9 S- Run * 9 S- Run * 9 S- Control of the second sec

S-Run *10

S- Run # II

CP06-L30 SEEPAGE MGMT PLOT PGT DEPTH: 70.0-75.0 **S**- Run#12

CPO6-L30PP-CB-0003 DEPTH: 75.0-76.5

CPO6-L30PP-CB-0003 DEPTH: 76.5-78.0 <mark>1</mark>5

CPO6-L30PP-CB-0003 DEPTH: 780-795

CPO6-L30 SEEPAGE MGMTPILOT 79.5-810

CPO6-L30PP-CB-0003 DEPTH: 81.0-82.5

CPO6-L30PP-CB-0003 DEPTH: 02.5.840

CPO6-L30PP-CB-0003 DEPTH: 840-855

CPO6-L30 SEEPAGE MGMTPILOT PGT DEPTH: 85.5-820 S-5-820





CPO6-L30PP-CB-0003 DEPTH: 90.0.91.5

S-35 S-35



CPO6-L30PP-CB-0003 DEPTH: 94.5-96.0

CPO6-L30 SEEPAGE MGMT PILOT PGT DEPTH: 96.0-97.5.

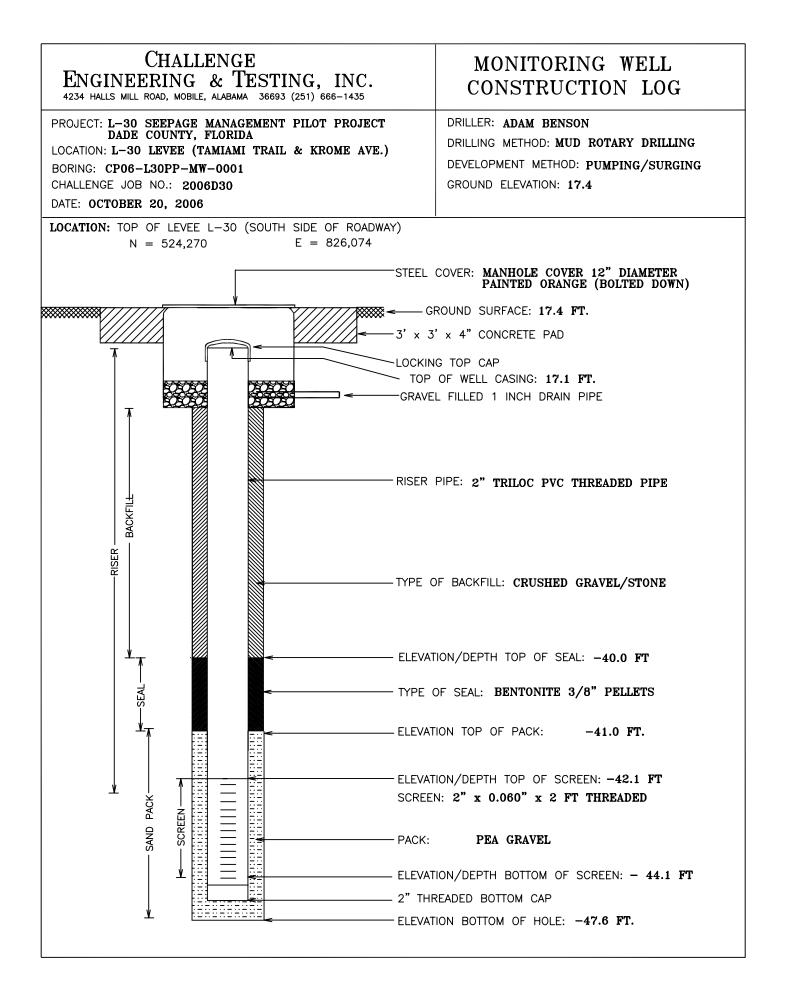
CPOG-L30PP-CB-0003 DEPTH: 97.5-99.0

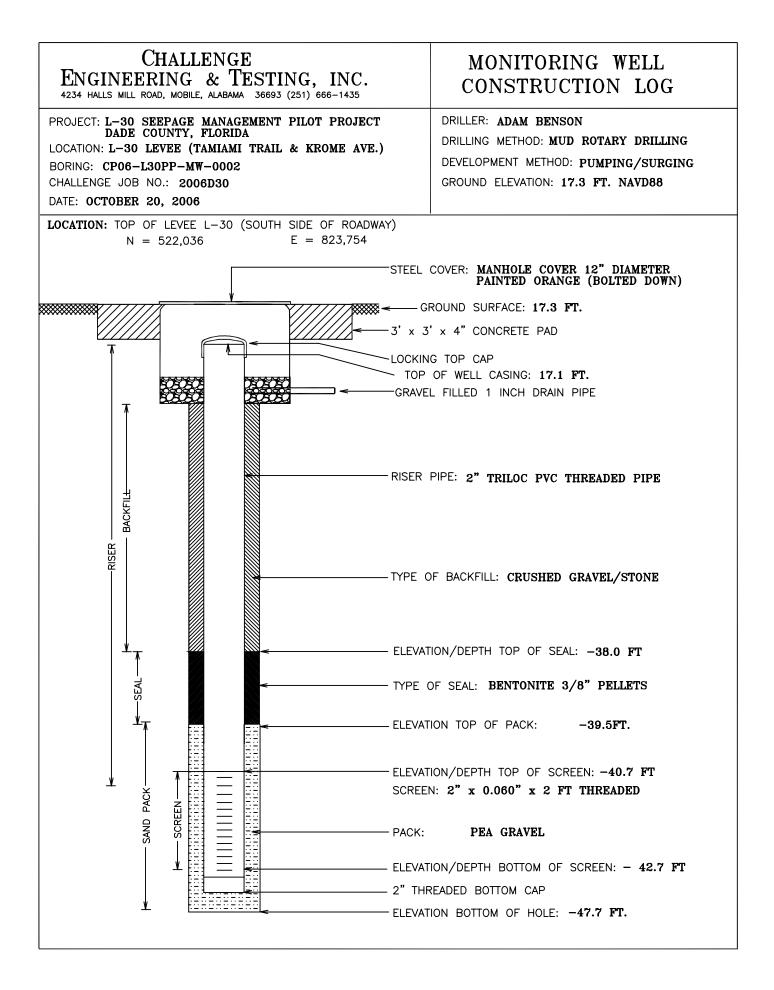
CPO6-L30 SEEPAGE MGMTPILOT PC DEPTH: 99.0-100.5 5

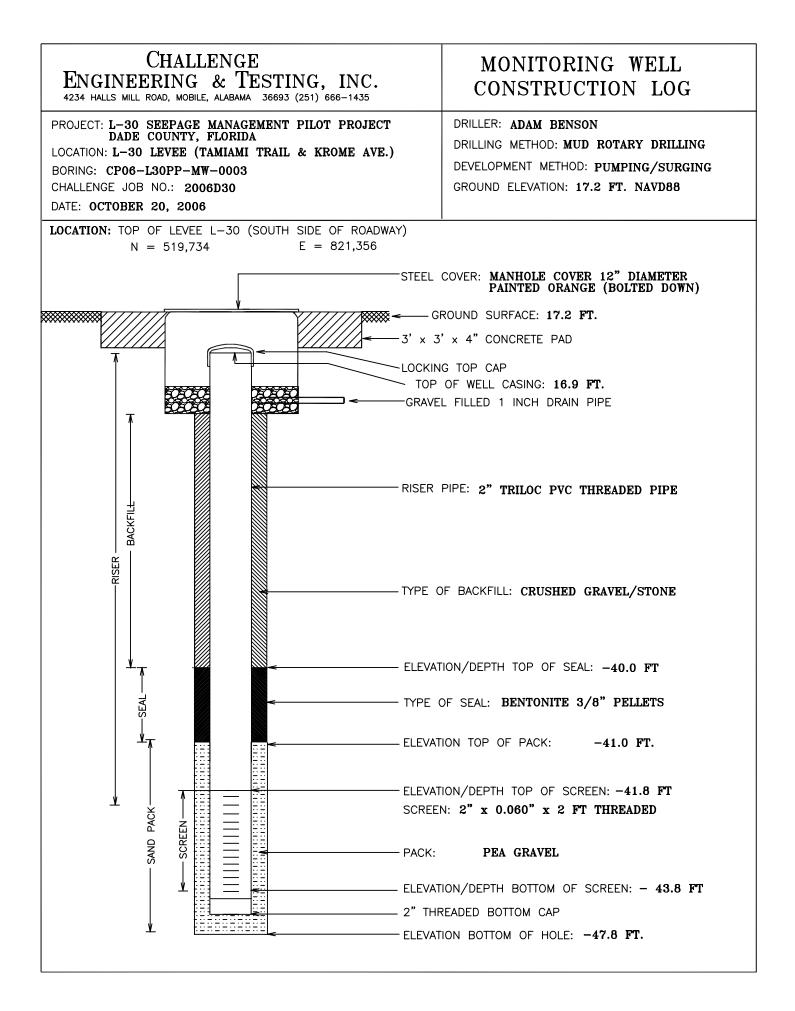
CPO6-L30PP-CB-0003 DEPTH: 100.5-102.0 W

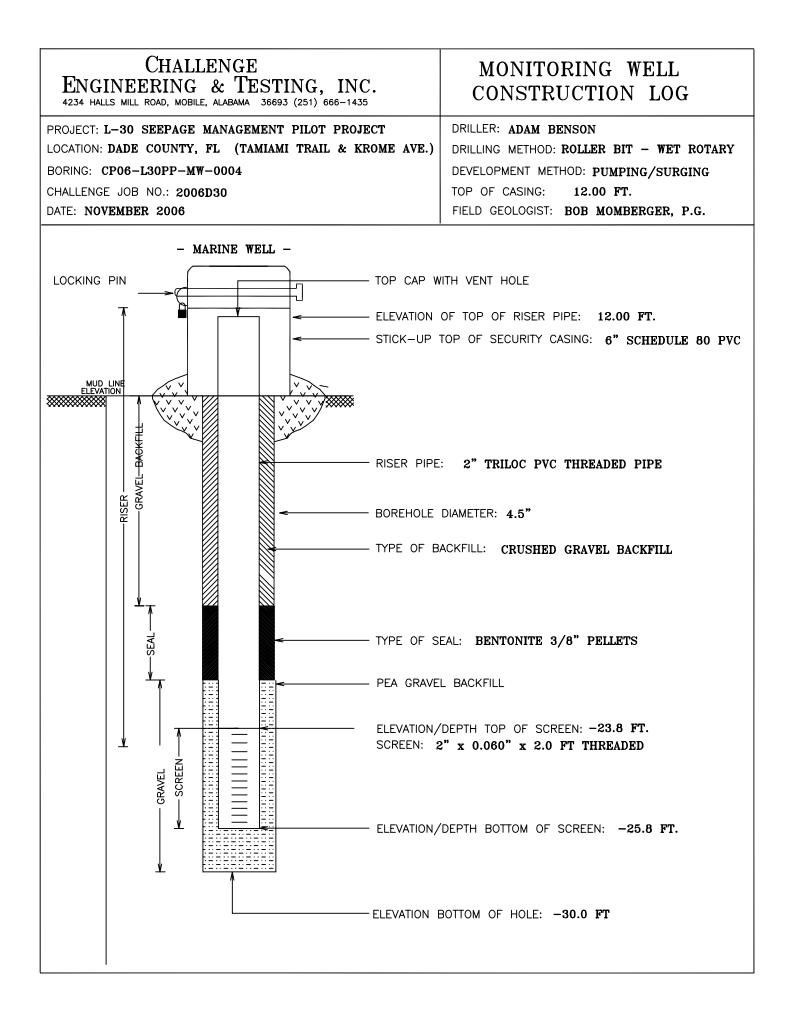
CPOG-L30PP-CB-0003 DEPTH: 103.5-105.0 いい

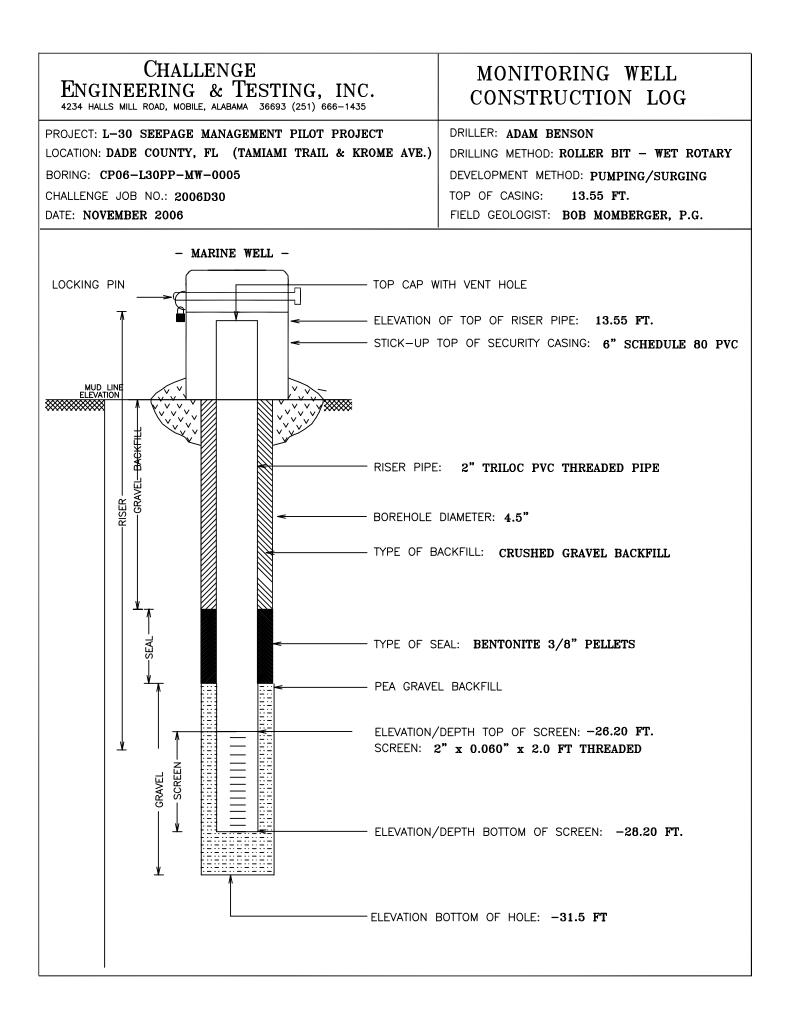
MONITORING WELL CONSTRUCTION DIAGRAMS











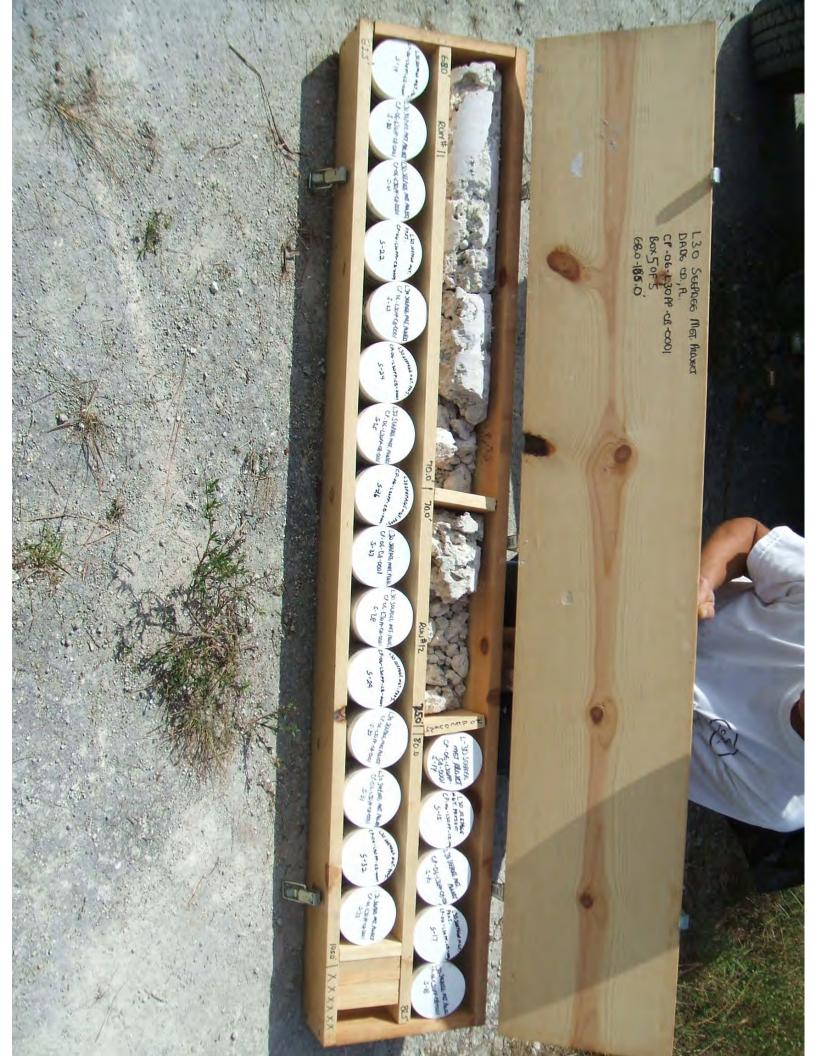
CORE BOX INVENTORY REPORT & PHOTOGRAPHS



























U.S.G.S. BOREHOLE LOGS

