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1.0 INTRODUCTION

This appendix presents discussion and results of modeling activities since the Final Basis of Design Report (BODR) was submitted on April 14, 2006. Several BODR models were updated with new information pertaining to the Preliminary Design. These models are the water budget model (RESHDR), in-reservoir water quality model (CE-QUAL-W2), reservoir and STA treatment model (DMSTA2), and the groundwater model (MODFLOW). Additionally, there is discussion presented regarding the STA configuration and the relationship of C-44 Canal flow and total suspended solids. These analyses were performed to respond to the BODR review comments and to reflect the current configuration of the proposed facility.

2.0 WATER BUDGET MODEL

2.1 RESHDR

The project-level water budget model used by HDR Engineering is identified as "RESHDR". The model was updated for the Preliminary Design Phase (PDP) project configuration, which increased the STA cell acreage from 6,200 to 6,300 acres and modified the shape of the Reservoir without changing the area (3,400 acres). The model was also run using actual flows and stage data in the C-44 Canal, which were provided by the District and DBHYDRO.

The water budget model simulates the Reservoir water budget on the basis of a daily time step. Inflows to the proposed Reservoir/STA system include rainfall and C-44 and C-23 Basin flow. Outflow in the model includes evapotranspiration, seepage, irrigation releases, and releases to the C-44 Canal. The general equation used in the simulations is:

> Rainfall + diverted basin inflow = change in reservoir storage + change in STA storage + evapotranspiration + seepage + irrigation releases + releases to C-44 Canal

Relationships are used to determine Reservoir and STA stage (depth) resulting from the addition of a volume of inflow and the subtraction of a volume of outflow. Details of the model and previous results are provided in Section 7.2 of the Final Basis of Design Report. The new model runs and results are discussed in the next sections.

2.1.1 Project Design Flows for the C-44 and C-23 Canals

The WaSh model, developed by URS Corporation for the District, was used in the Final BODR to generate a time series of flows and nutrient concentrations simulating the period from 1965 to 2000 for the C-44 and C-23 basins. The first three years of the simulation (1965-1967) were removed to ensure that any start-up effects were eliminated. As applied to this Project, the WaSh model used historic rainfall-runoff relationships (calibrated and validated for the watersheds) to develop flows (quantity)

and loads (quality) over the long-term (36 years). The WaSh model simulations did not include Lake Okeechobee regulatory releases. The water budget model run with C-44 and C-23 Canal inflows is considered the base case for the Project.

For the PDP, new daily time series of actual data from 1/1/1982 to 12/31/2000 for flow and nutrients were developed for the C-44 Canal by staff at the South Florida Water Management District (District) for use in the water budget model. The purpose of this water budget model scenario is to evaluate the project performance under actual conditions that will be present in the basin when the Project comes online. The data was generated using a District algorithm to process observed flow data and total phosphorus (TP) concentrations in the canal. Additionally the stage for C-44 recorded at S-80 was downloaded from DBHYDRO. The period of record is 10/1/1987 to 12/31/2000. All of the C-44 Canal observed data includes the regulatory or irrigation releases recorded at the monitoring stations.

2.1.2 Model Simulations and Results

RESHDR was utilized to evaluate Reservoir storage/stage, STA storage/stage, amount of available basin flow captured, and the amount of water discharged to the STAs. Operational assumptions for the four cases run are shown in Table 2.1. In Cases 1 and 2, there was an attempt to optimize the Reservoir and STA storage while maximizing the amount of basin flow captured and minimizing high flows to S-80. The WaSh model basin flow results for the C-44 and C-23 Basins were used as inflows for these two cases. In Cases 3 and 4, actual flow data were used, and only the 0.75-ft high weirs on the downstream end of the STA cells restricted site discharge to the C-44 Canal. In Case 4, the C-44 stage recorded at S-80 was used to turn four 275-cfs pumps on and off according to the project design pump schedule shown in Table 2.2. Since the water budget model operates on a daily time step, the inherent assumption is that the available inflows would be captured on a 24-hour basis. Since the pumps will be electric, 24-hour operation has been proposed.

Table 2.1 Assumptions for the Preliminary Design Water Budget Model

Case	Description	Assumptions
1	Base Case	Base Case: 15-foot deep reservoir, 1100 cfs max inflows, WaSh model basin flow inputs for C-44 and C-23 (no regulatory releases), SFWMM model inputs, run through the year 2000 with the first three years designated as start-up, 3-foot reserve water depth in reservoir, flow restricted to 735 cfs max at S-80
2	C-44 Only with WaSh Model Input	C-44 Only Case: 15-foot deep reservoir, 1100 cfs max inflows, WaSh model basin flow for C-44 Only, SFWMM model inputs, run through the year 2000 with the first three years designated as start-up, 3-foot reserve water depth in reservoir, flow restricted to 735 cfs max at S-80

Case	Description	Assumptions
3	C-44 Only with Actual Flows from S-308	Actual Data, C-44 Only Case: 15-foot deep reservoir, 1100 cfs max inflows, actual flow at S-308 from SFWMD, SFWMM model inputs for rainfall and evaporation, data period 1982 to 2000, 3-foot reserve water depth in reservoir, discharge to C-44 restricted by STA outlet weirs only
4	C-44 Only, Actual Flow S-308, 4-Pump Scenario, S-80 Elevations	Actual Data, 4-Pumps, C-44 Only Case: 15-foot deep reservoir, 1100 cfs max inflows, actual flow at S-308 and actual stage at S-80 from SFWMD, SFWMM model inputs for rainfall and evaporation, data period 1987 to 2000, 3-foot reserve water depth in reservoir, discharge to C-44 restricted by STA outlet weirs only, inflows to reservoir based on S-80 stage and 4 pump schedule

For all cases, the model simulated a target maximum Reservoir depth of 15 feet and a minimum Reservoir depth of 3 feet. The 3-foot minimum depth was incorporated in an attempt to maximize STA hydration and provide incidental storage as discussed in the IRL-S PIR. A target average STA depth of 1.5 feet and minimum depth of 0.75 feet were incorporated into the model. The model also incorporated rules intended to maintain a minimum water level in the STAs to prevent them from going dry for extended periods of time.

Table 2.2 Case 4 Pumping Schedule

C-44 Canal Water Level		Maximum No. of Pumps	Normal Pumping Capacity cfs
NGVD ft	NAVD88 ft		
14 or greater	12.6 or greater	4	1100
13.5	12.1	4	1100
13	11.6	4	1100
12.5	11.1	3	825
12	10.6	3	825

The results of the RESHDR model for Cases 1 through 4 are provided in Table 2.3 and Figures 2.1 to 2.4. Cases 1 and 2 both meet the project basin flow capture goal of 65% for the C-44 Basin. There is no set goal for the C-23 Basin other than capturing as much possible for treatment. Cases 3 and 4 do not have basin capture goals since they include Lake Okeechobee regulatory release flow. However, as is evident from the results, the project can capture and treat a significant percentage of the current flows in the C-44 Canal. The graphs of STA depths show that the cells remain hydrated more consistently in cases 3 and 4 due to weir control of the outflows.

Table 2.3 Results of Cases 1 through 4

Cases	C-44 Canal Flow Capture	C-23 Basin Flow Capture
1	66%	46%
2	75%	n/a
3	51%	n/a
4	47%	n/a

2.1.3 Summary

The results of the C-44 water budget model confirm the BODR results in that the Project as configured on the 12,000 acre site can meet the storage goals of the IRL-S PIR when the other components of the CERP are in place. The model results also indicate that the system should capture a significant amount of flow under the current conditions in the C-44 Basin, which includes regulatory releases.

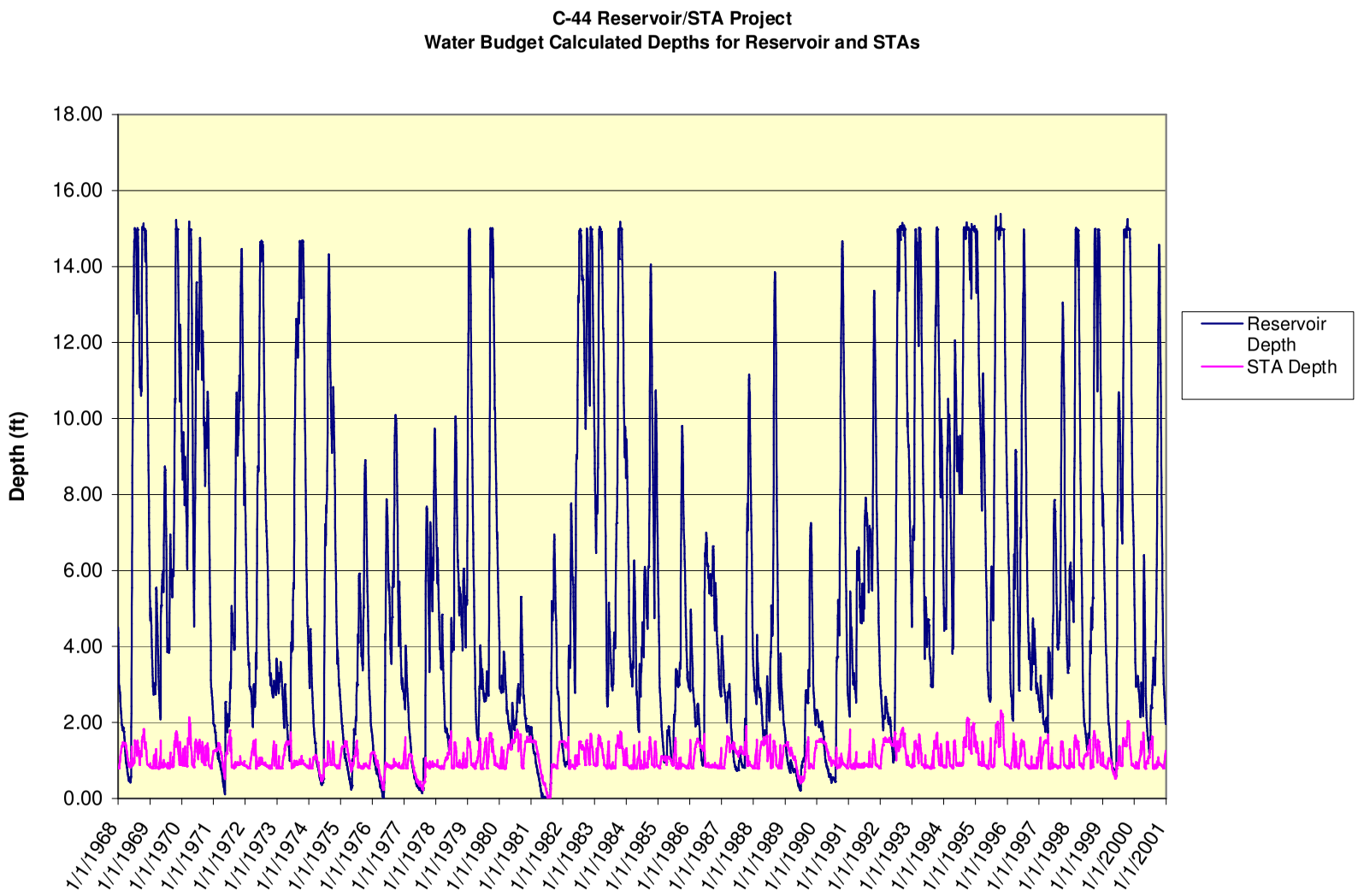


Figure 2.1 RESHDR Reservoir and STA Depths for Case 1

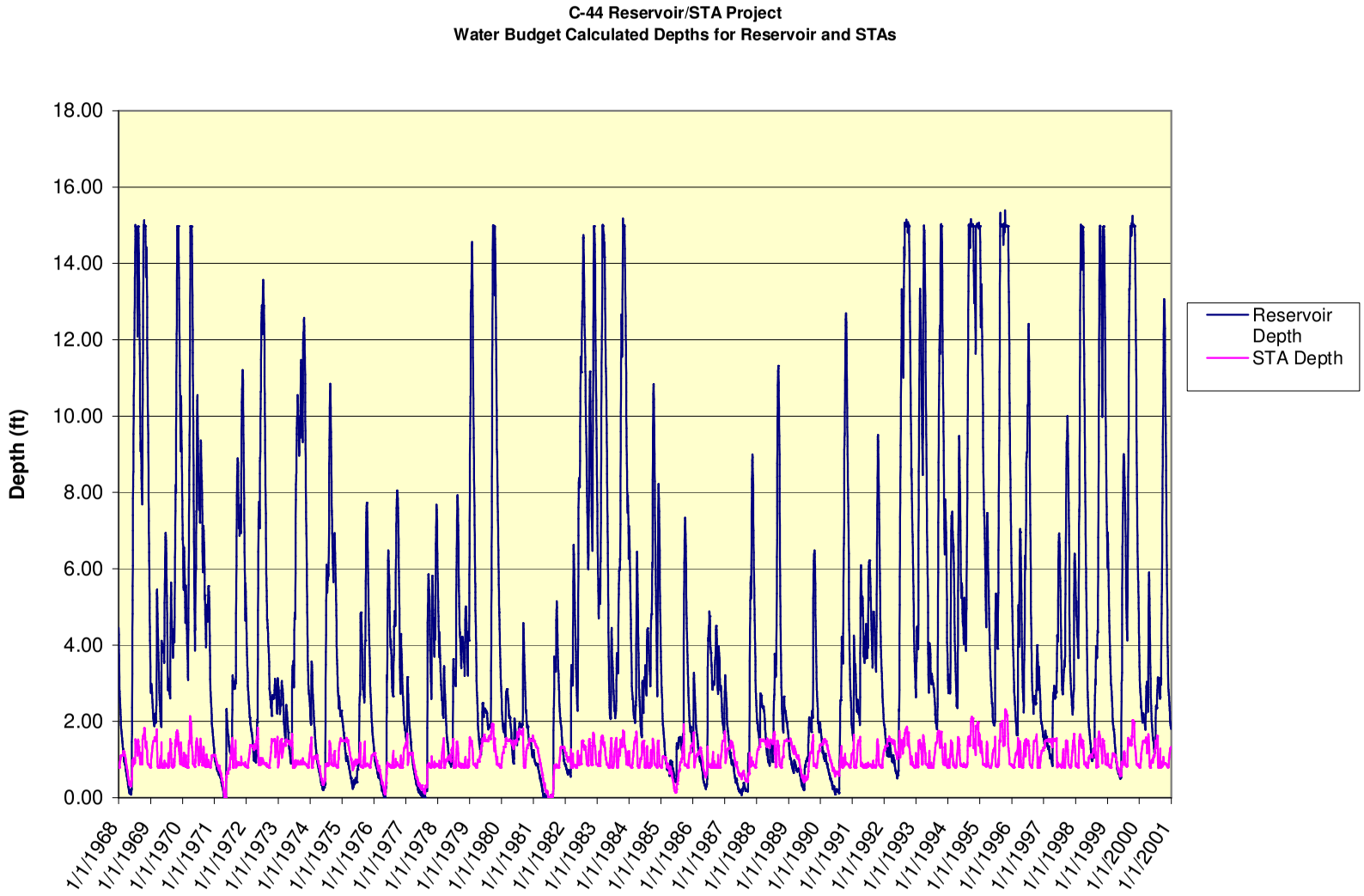


Figure 2.2 RESHDR Reservoir and STA Depths for Case 2

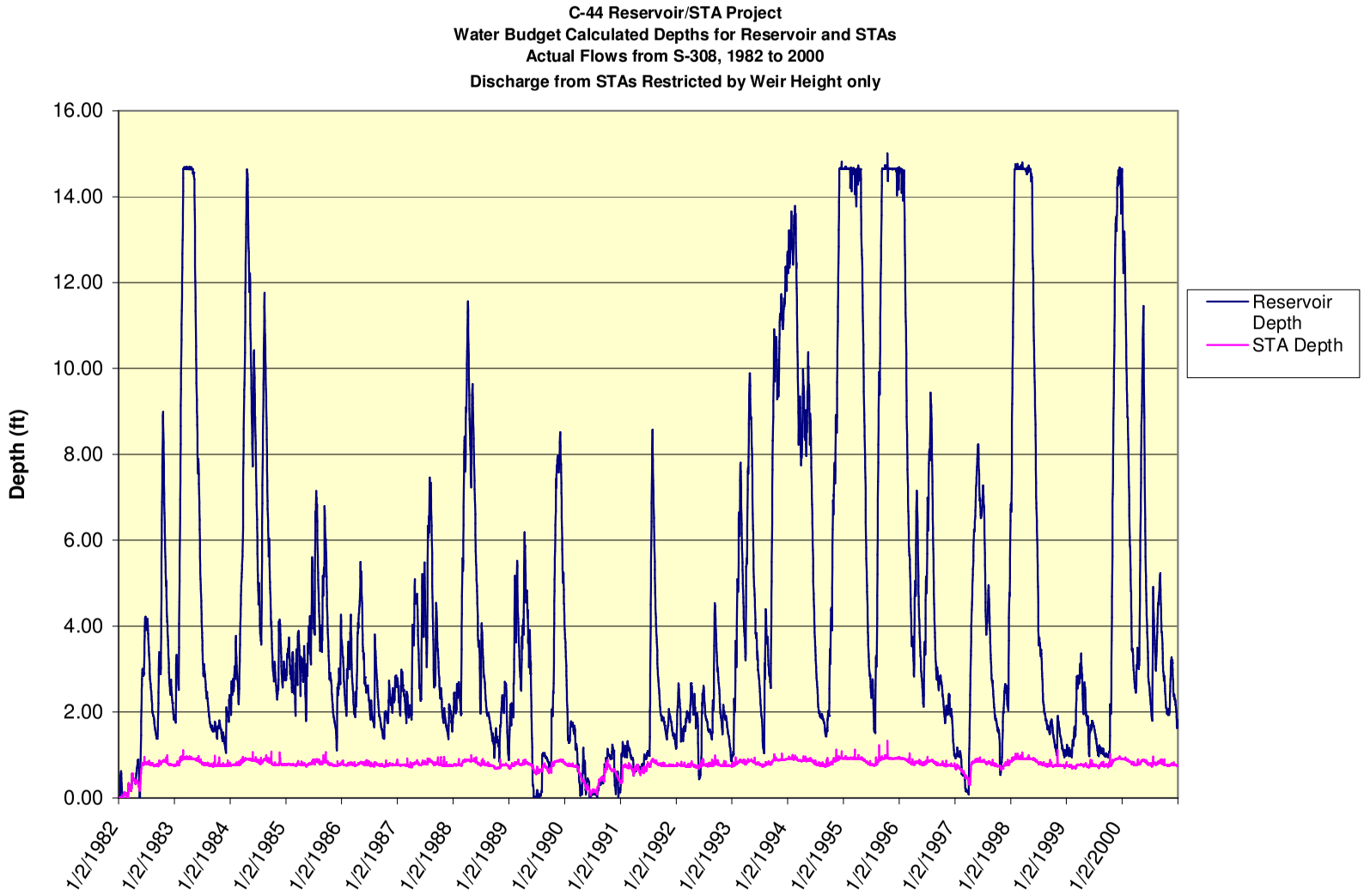


Figure 2.3 RESHDR Reservoir and STA Depths for Case 3

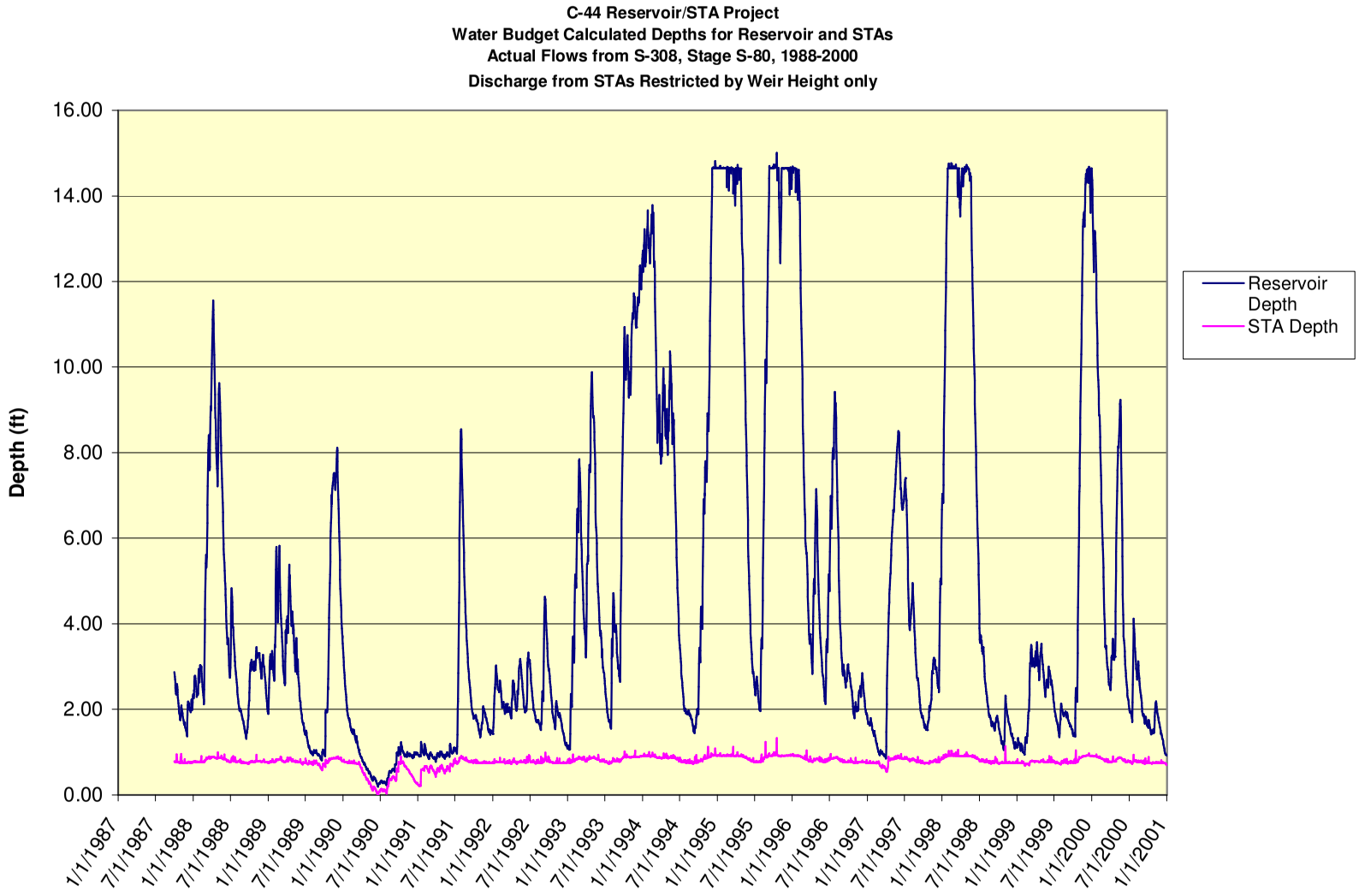


Figure 2.4 RESHDR Reservoir and STA Depths for Case 4

3.0 WATER QUALITY

3.1 CE-QUAL-W2

The water quality model CE-QUAL-W2 was applied to the C-44 Reservoir during the BODR Phase to evaluate in-reservoir water quality. A primary goal of the C-44 Reservoir/STA Project is to reduce annual phosphorus loads by approximately 34,557 kg/year (IRL-S PIR) excluding reductions from land conversion and irrigation. In addition to modeling phosphorus, the model was applied to evaluate other water quality parameters, such as algae and dissolved oxygen. The Reservoir is expected to provide nutrient treatment to support the PIR goal, and the model was updated to assess this objective with the updated project configuration.

3.1.1 Overview of Previous Work during BODR Phase

Previously, the CE-QUAL-W2 simulations indicated that total phosphorus reduction by the Reservoir is sensitive to algal production in the Reservoir. Simulation of nitrogen-fixing cyanobacteria produces more algal biomass and results in higher levels of treatment. On the other hand, lower inflow loads produce less algal biomass and treatment is lower. Refer to Section 8.0 and Appendix 8.0 of the Final BODR (April 14, 2006) for full details. The following preliminary BODR conclusions were based on results of reservoir modeling, a review of water quality in reservoirs in southern Florida, and best professional judgment:

- The Reservoir will convert inorganic phosphorus to organic phosphorus for effective removal by the C-44 Stormwater Treatment Area (STA). This is evident from the reduction of available phosphorus when nitrogen fixing cyanobacteria are simulated.
- Annual reductions in phosphorus are anticipated. However, long-term monthly and annual discharge loads will be affected by sediment resuspension and anaerobic release of phosphorus.
- Nitrogen treatment by the Reservoir is more uncertain because of the potential for nitrogen fixation by blue-green algae.

3.1.2 Preliminary Design Setup

The Final BODR presented a Reservoir configuration of 3,400 acres at a 15-ft maximum depth. Although these elements have not changed since its issuance, the Reservoir embankment has been modified to a rectangular shape and the internal dike has been removed, as presented in Figure 3.1. As such, the bathymetry and water balance inputs (see Appendix A Section 2.0) to the model have been updated as part of the Preliminary Design Phase (PDP). Other essentials of the model setup for the PDP are equivalent to the BODR, such as meteorological conditions and temperature data. Again, modeled inflows and water quality from the WaSh and RESHDR models for 1993 were used as input for the Reservoir water quality simulations. The 1993 time period for this set of simulations, referred to as a

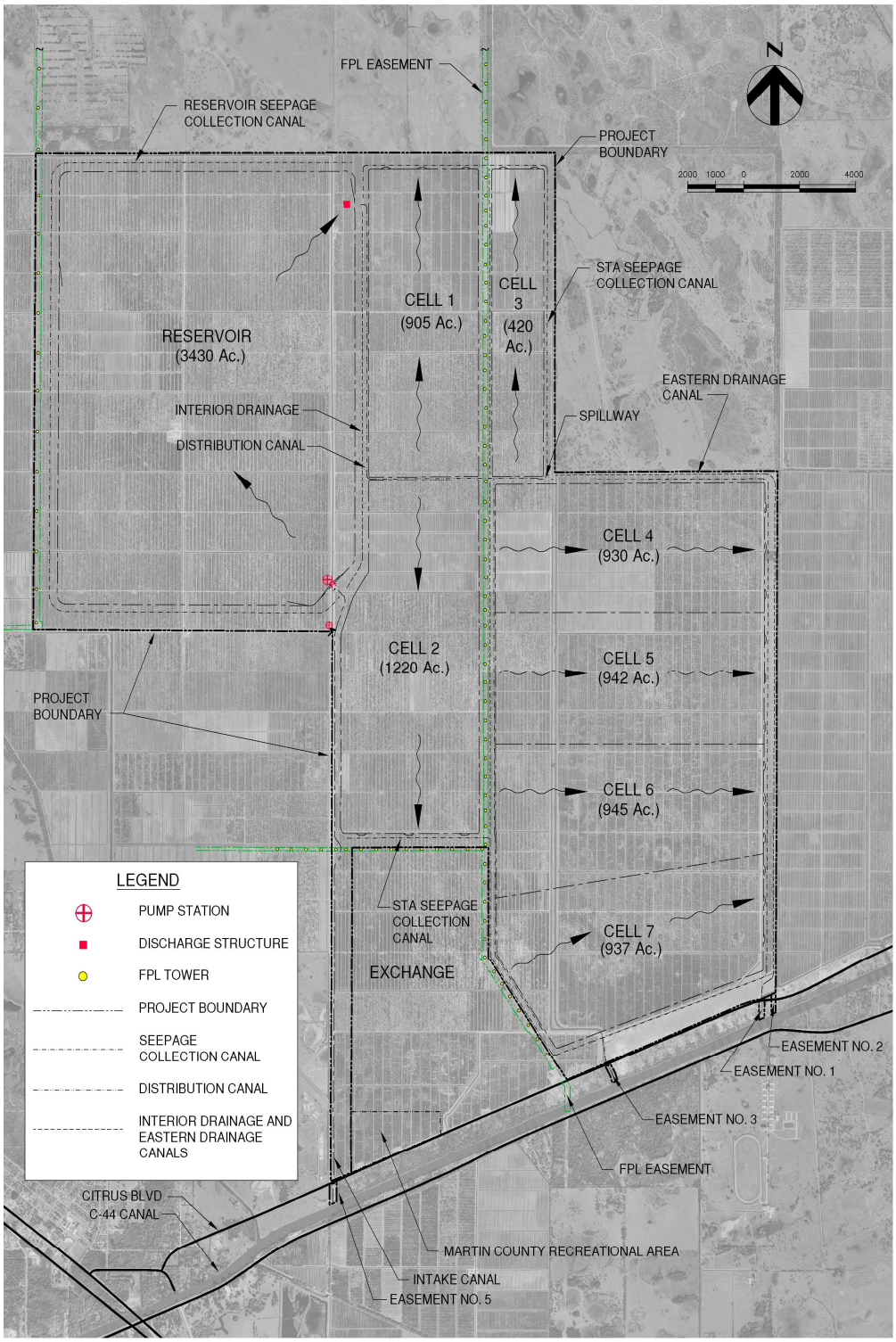


Figure 3.1 C-44 Project Configuration for Preliminary Design Modeling

baseline condition, was selected for these initial simulations because it was within the WaSh modeling period, and the Reservoir water level varied from full to relatively shallow depths.

The updated Reservoir design is represented as a series of segments beginning at the inflow and ending at the discharge, as presented in Figure 3.2.

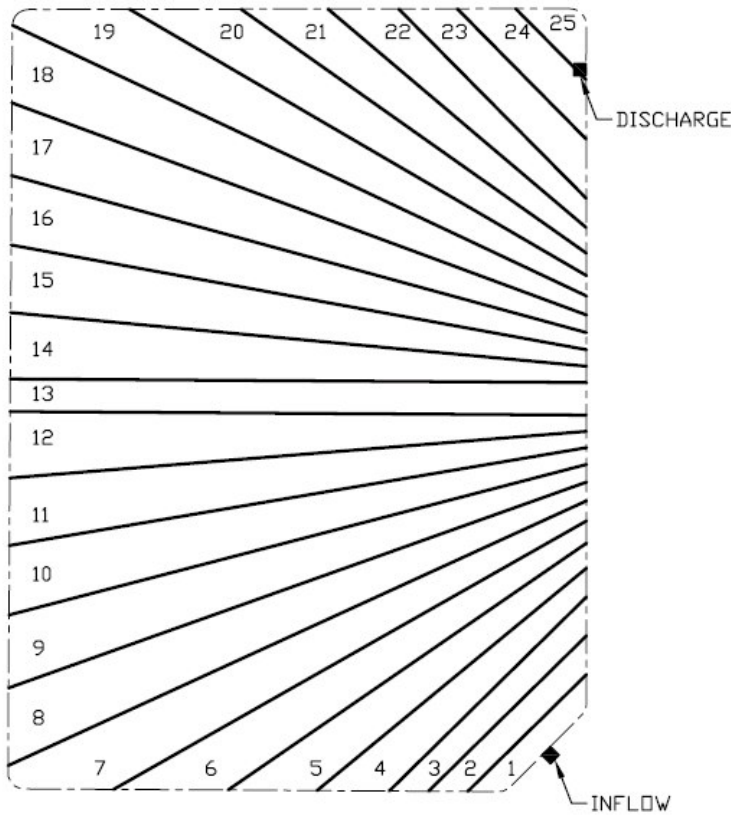


Figure 3.2 Updated Reservoir Segmentation for CE-QUAL-W2

3.1.3 Preliminary Design Results

The baseline and scenario model runs, presented in Table 3.1, were updated for the PDP based on the setup used during Basis of Design. This update allowed for the assessment of Reservoir performance with the modified configuration. These PDP model runs are compared to the baseline model and the corresponding scenarios presented in the BODR. The BODR presented two baseline models, straight dike and Y-shaped dike, which produced similar results. The comparable baseline runs and the likelihood of the Y-shaped dike being incorporated into the design led to the setup of scenarios with the Y-shaped baseline model. This baseline run and its corresponding scenarios were compared to the PDP runs.

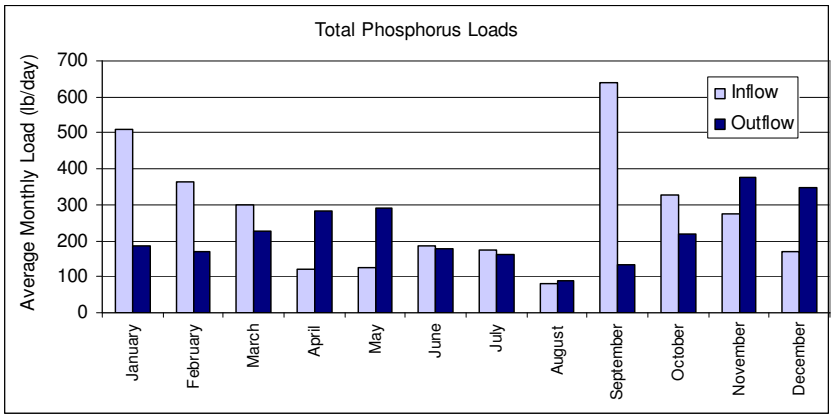
Every scenario setup and set of results, as presented in Section 8.0 and Appendix 8.0 of the BODR, are similar to the results investigated for the PDP. No key changes in load reduction, levels of algae, dissolved oxygen, available phosphorus, or total phosphorus were observed. Table 3.2 and Figure 3.3 present results for the total phosphorus load reduction. There was a small difference between the pumped inflow values due to the water budget rules and the modified STA for Preliminary Design. All modeling files can be found on the modeling DVD provided with the Preliminary Design Report Package.

Table 3.1 CE-QUAL-W2 Model Scenario Runs

CE-QUAL-W2	Scenario Run Description	Noted Changes
Baseline	Updated Bathymetry and Water Balance Inputs in Setup	Annual Load Reduction Decreased by 1%
Full Depth Reservoir	Baseline with Constant Reservoir Depth at 15 feet	None
3-Ft Depth Reservoir	Baseline with Constant Reservoir Depth at 3 feet	None
Top Discharge Reservoir	Baseline with Top Discharge Set Constant at 41 feet NAVD88	None
Bottom Discharge Reservoir	Baseline with Bottom Discharge Set Constant at 26.5 feet NAVD88	None
Algae Bloom	Baseline with Florida Blue-Green Algae, *microcystis*	None
Nitrogen-Fixer Algae Bloom	Baseline with Florida Blue-Green Algae, *anabaena*	None
Reduced Loads to Reservoir	Baseline with 90% Reduction in Input Loads	None

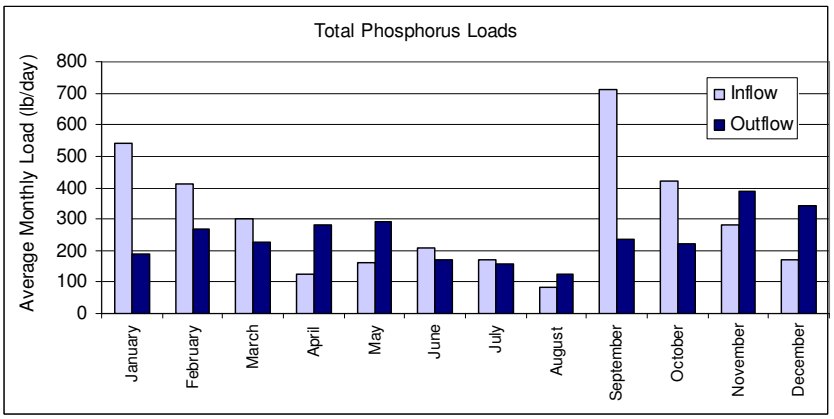
Table 3.2 BODR and Preliminary Design Total Phosphorus Load Reduction

CE-QUAL-W2 Load Reduction in Baseline Setup	kg/yr	Load Reduction
Basis of Design Level Inflow	45,032	19%
Basis of Design Level Outflow	36,754	
Preliminary Design Level Inflow	49,171	18%
Preliminary Design Level Outflow	39,900	



	Annual Average (kg/day)
Inflow	123
Outflow	101
Reduction	18%

a) Preliminary Design Load Reduction



	Annual Average (kg/day)
Inflow	135
Outflow	109
Reduction	19%

b) Basis of Design Report Load Reduction

Figure 3.3 Comparison of Preliminary Design and BODR Total Phosphorus Load Reduction for Baseline Scenarios

3.1.4 Preliminary Design Conclusions and Recommendations

A comparison of the Reservoir water quality model results indicates that:

- Reservoir pool elevation and inflow/outflow dynamics impact both the in-reservoir and discharge water quality. In general, a deeper reservoir and increased loads result in increased treatment.
- There are few differences in the simulated water quality results when compared to the BODR results. The reconfiguration of the Reservoir with no internal dike and relocation of the discharge structure appears to have little influence on in-reservoir or discharge water quality. The purpose of the dike was to promote circulation throughout all areas of the reservoir and to prevent

short-circuiting. CE-QUAL-W2 inherently assumes that each model segment is well-mixed, so although it does not capture the circulating effects of a dike, the model setup does direct segmented flows through the Reservoir footprint.

- The configuration of the discharge outlets appears to have little influence on water quality.
- The presence of a microcystis algae bloom appears to have only a small influence on water quality as compared to the baseline conditions.
- The model results indicate a slightly decreased annual total phosphorus load reduction and small increases within in-reservoir concentrations of algae and phosphorus for the updated PDP model. Only insignificant decreases in dissolved oxygen were observed with increasing Reservoir depth.
- Reservoir algal and nutrient levels are comparable to baseline conditions when 90 percent reduction of nitrogen, phosphorus, and algae are simulated as inputs. Algal and total phosphorus reduction decrease at the reservoir discharge, supporting reservoir sensitivity to inflow loads.
- Total phosphorus load reduction is comparable to the reservoir treatment simulated with DMSTA2. Both models predict an approximate 18% reduction in the reservoir alone.

3.2 Dynamic Model for Stormwater Treatment Areas (DMSTA) Version 2.0

This section summarizes estimates of total phosphorus (TP) removal performance for the C-44 Reservoir/STA Project for the Preliminary Design Phase (PDP) configuration depicted in Figure 3.1. Reservoir and STA performance estimates were developed using the Dynamic Model for Stormwater Treatment Areas Version 2 (DMSTA2). Refer to Final BODR (April 14, 2006) Section 7.0 and Appendix 7.0 for more detail on the model.

3.2.1 Overview of Previous Work during BODR Phase

Six cases were examined during the BODR Phase (refer to the BODR for more information):

Case 1: IRL-S PIR Reservoir, 10 foot depth, 1,350 cfs maximum withdrawal for C-44 and C-23 water, 1968-1995 period of record

Case 2: Reservoir, 15 foot depth, 1,350 cfs maximum withdrawal for C-44 and C-23 water, 1968-1995 period of record

Case 3: Reservoir, 15 foot depth, 1,100 cfs maximum withdrawal for C-44 and C-23 water, 1968-1995 period of record

Case 4: Reservoir, 15 foot depth, 1,100 cfs maximum withdrawal for C-44 and C-23 water, 1968-2000 period of record

Case 5: Reservoir, 15 foot depth, 1,100 cfs maximum withdrawal for C-44 water, 1968-2000 period of record

Case 6: Reservoir, 15 foot depth, 1,100 cfs maximum withdrawal for C-44 water, 1996-2000 period of record

The 15-ft reservoir allows for increased inflow TP load to the STAs, which results in a higher overall load removal. Case 3 reduces the maximum inflow to the Reservoir from 1,350 cfs to 1,100 cfs, which is consistent with the proposed pump station capacity. This reduction in inflow to the Reservoir does not significantly change the load reduction from Case 2. Additional data in Cases 4 through 6 include significant drought years. However, the comparison of Cases 3 and 4 demonstrated that the inclusion of these data does not decrease the load removal; rather it increases slightly. In general, the BODR-level results indicated that the Project nutrient reduction goals can be met for the proposed configuration, especially via flexible system operation. That is, the Reservoir and STA cells as configured should be able to remove 34,557 kg/yr of phosphorus. The results also indicated that if flows are available, the system can treat and release Lake Okeechobee regulatory release water that would otherwise flow to the Saint Lucie Estuary with no treatment.

3.2.2 Preliminary Design Setup

The modified setup for the Preliminary Design Phase included a slight increase in STA area (100 acres) and updates to the water budget and nutrient concentration inputs. Four cases were run as an update to the Final BODR, and these are described below. Refer to Section 2.0 of this appendix for more information on the four cases that serve as flow input to DMSTA2. All cases included a 15-ft reservoir and an 1,100 cfs maximum withdrawal, the total capacity of the reservoir pump station.

Four redefined cases were examined during Preliminary Design Phase:

Case 1: C-44 and C-23 Canal TP data from the WaSh model and flows from the RESHDR water budget model, 1968-2000 period of record, no regulatory releases (basin runoff only)

Case 2: C-44 Canal TP data from the WaSh model and flows from the RESHDR water budget model, 1968-2000 period of record, no regulatory releases (basin runoff only)

Case 3: C-44 Canal observed TP data and flows from the District data used in the RESHDR water budget model, 1982-2000 period of record, actual regulatory and irrigation releases at S-308

Case 4: C-44 Canal observed TP data and flows from the District data used in the RESHDR water budget model, 1987-2000 period of record, actual regulatory and irrigation releases at S-308, includes proposed pumping schedule based on C-44 Canal stage at S-80

3.2.3 Preliminary Design Results

The results from the four cases are presented in Table 3.3. In addition, Figure 3.4 presents the overall treatment for the period of record obtained for Case 1, which is comparable to the conditions simulated for Case 4 during the BODR phase. Cases 3 and 4 are most representative of the initial years of operation since regulatory releases are included and C-23 flow is not included. In the IRL-S PIR, the C-23 diversion water is included as an input to the Project, and thus, it is included in the WaSh model cases. Therefore, Cases 1 and 2 compare significantly different inflow total phosphorus (TP) loads to the Project.

3.2.4 Discussion and Conclusions

The TP load reduction in the Reservoir and STA cells as modeled in DMSTA2 depends on system operations, as demonstrated by Cases 3 and 4, and input nutrient concentrations, as demonstrated in cases with actual data vs. WaSh inputs. In general, modeled WaSh concentrations are higher than actual data; hence the higher efficiencies in Cases 1 and 2. All four cases simulate emergent vegetation only within the STA cells, which results in a conservative estimate for TP load reduction. Submerged Aquatic Vegetation (SAV) zones, which increase TP load reduction when combined with emergent vegetation, are expected in areas where former citrus grove ditches exist. In addition, the model predicts that the STA cells will operate within depths during the period of record that produce an ecological system favorable to maximum plant growth. The frequency of STA depths reaching less than 0.33 ft (10 cm) is very low, as shown in Table 3.3.

.

Table 3.3 Summary of Preliminary Design DMSTA2 Case Results

Variable	Units	Case 1		Case 2		Case 3		Case 4	
		Reservoir	STA	Reservoir	STA	Reservoir	STA	Reservoir	STA
Inflow Volume	hm^3/yr*	196	178	145	131	200	160	196	171
Inflow P Load	kg/yr	39518	29585	25249	18159	30186	21041	29138	21555
Inflow FWM P Concentration	ppb	202	166	174	138	151	132	149	126
Mean Hydraulic Loading Rate	cm/day	4	2	3	1	4	2	4	2
Outflow Volume	hm^3/yr	196	178	146	131	201	161	197	172
Outflow P Load	kg/yr	32722	8837	20101	4135	25589	6029	24498	6666
Outflow FWM P Concentration	ppb	167	50	138	31	127	38	125	39
Mean Depth	cm	175	43	137	40	134	44	137	44
Minimum Depth	cm	1	1	1	1	1	20	1	17
Maximum Depth	cm	460	66	446	66	313	72	352	72
Frequency Depth < 10 cm	%	4.3%	0.8%	8.1%	1.4%	7.8%	0.0%	5.1%	0.0%
P Load Removed	kg/yr	6796	20747	5148	14024	4597	15012	4640	14889
P Load Removal Efficiency	%	17%	70%	20%	77%	15%	71%	16%	69%
Total P Load Removed	kg/yr	27,543		19,171		19,608		19,528	
Total P Load Removal Efficiency	%	70%		76%		65%		67%	

*1 hm^3/yr = 1,000,000 m^3/yr
*FWM = flow-weighted mean

Cases by Description

1 - 15ft Reservoir, 1100 cfs max, WaSh Data 1968-2000, C44 & C23
2 - 15ft Reservoir, 1100 cfs max, WaSh Data 1968-2000, C44 only
3 - 15ft Reservoir, 1100 cfs max, Actual/Observed Data (1982-2000), C-44 only, includes regulatory/irrigation releases from Lake Okeechobee
4 - 15ft Reservoir, 1100 cfs max, Actual/Observed Data (1987-2000), C-44 only, includes regulatory/irrigation releases from Lake O, uses 4-pump schedule

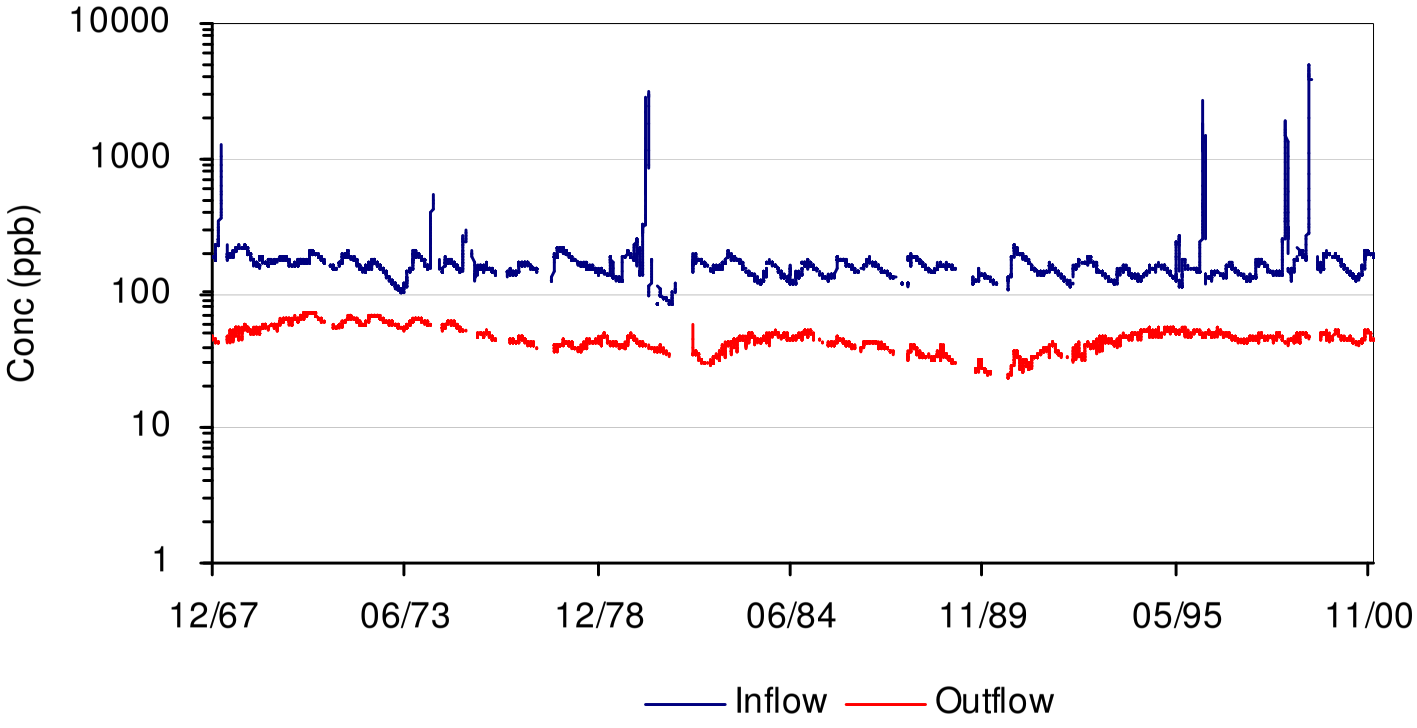


Figure 3.4 Preliminary Design Case 1 Total Phosphorus Treatment

3.3 Stormwater Treatment Area Layout Evaluation

The C-44 Reservoir/STA Project consists of seven stormwater treatment area (STA) cells. The layout of these cells impacts their effectiveness in reducing phosphorus and nitrogen, which impacts the water quality performance goals of the project. The sub-division of the available property into separate cells was a function of the following site constraints and design objectives:

- Location and geometry of the property boundary
- Location of Florida Power & Light easements and existing large irrigation/drainage canals
- Optimized location of the proposed reservoir
- Existing topography
- Maximization of operational flexibility and treatment effectiveness
- Minimization of construction costs

The influence of each of these controlling factors is described below.

3.3.1 Property Boundary

The property boundary is an irregular shape that does not lend itself to a simple layout of parallel or serial STA compartments. The recent land exchange shifted acreage from the south near Indiantown Airport to the north.

3.3.2 Florida Power & Light Easements and Canals

Within the property boundary, the site is divided into regions that are defined by the existing locations of large irrigation/drainage canals and overhead power lines (see Figure 3.1). These features effectively partition the site into a western region (~6,000 acres) and an eastern region (~4,500 acres). Consideration was given to moving the two transmission lines that cross the project site; however, the SFWMD decided not to request relocation of the powerlines because of the cost and potential impact to the construction schedule. Preliminary analyses conducted for the Basis of Design Report also indicated that the project budget could not support filling the larger canals.

3.3.3 Reservoir Design

The proposed reservoir (~3,400 acres) was sited within the western part of the project area for the following reasons:

- The existing major irrigation/drainage canals could be used to convey water from the C-44 Canal to the reservoir inflow pump station.

- A large, contiguous area was needed for the reservoir that would facilitate a design that minimized the ratio between levee embankment length (reservoir perimeter) and wetted surface area.
- Siting the reservoir to the west places it upstream from the STA cells and allows the STA discharge point to be located downstream from the reservoir inflow canal.

3.3.4 Topography

The Project site is currently occupied by citrus groves. The site is generally flat with several small closed depressions representing isolated wetland areas; the mean elevation of the site is about 26 feet NAVD. The predominant topographic features are man-made and include canals, ditches, and roads for the operation of the citrus groves. Within the project site, there are approximately 4,000,000 linear ft (757 miles) of swales. The difference in elevation between the crown of the citrus rows and the bottom of adjacent swales varies from about 3 ft to about 6 ft. The north-south rows of citrus trees are transected by east-west dirt roads and east-west drainage ditches. The roads and ditches generally alternate on a spacing equivalent to ¼ of a section.

The site topographic features are a major consideration for the proposed STA design, because the cell interiors should be relatively flat (generally +/- 0.5 ft) from side to side (perpendicular to the direction of flow) and should be flat or have only mild slopes from inlet to outlet.

Existing ditches that run parallel to the flow are proposed to be filled and/or blocked to minimize hydraulic short circuiting within the STA cells. Conversely, ditches that are perpendicular to flow can be beneficial to the maintenance of sheet flow conditions and are proposed to be left in place. The increased cross-sectional area along the flow path will decrease velocity and likely redistribute flow if any preferential flow paths have formed upstream.

3.3.5 Operational Flexibility and Treatment Effectiveness

Emergent macrophyte STA cells have been proposed to reduce phosphorus and nitrogen loads in water from the C-44 and C-23 canals. While other types of STAs such as submerged aquatic vegetation (SAV) have been shown to yield lower outflow phosphorus concentrations than emergent macrophyte STAs, their use outside the Everglades Agricultural Area has not been sufficiently evaluated to recommend their specific inclusion as stand-alone cells in the project design.

In order to maximize the removal of nutrients, the hydraulic performance in the STA cells should be optimized. If preferential flow paths form and the flow short circuits from the inlet to the outlet, the contact between water and plants will be reduced. Uniform flow distribution in the STA cells encourages efficient use of the emergent vegetation that will cover the interior of the STA. Uniform flow distribution is

enhanced by using inflow and outflow ditches that span the width of each cell. Interior ditches that are oriented perpendicularly to the direction of flow may also aid flow distribution.

The aspect ratio (length:width) of the STA cells may also have an impact on hydraulic performance. Theoretically, as the aspect ratio increases, the system behaves more like a plug flow reactor and the water quality benefits increase. However, there is a physical upper limit as the horizontal velocity increases to the point where vegetation is scoured from the substrate and/or frictional head losses cause depths that stress vegetation. The primary model parameter that can be used to compare STAs with different aspect ratios is the number of tanks-in-series (N). However there is no defined relationship between aspect ratio and N, and the selection of N values is subjective. The potential gain in treatment performance for building long, thin STA cells is offset by the added cost of longer levee embankments.

3.3.6 STA Economics

Embankment length should be minimized to reduce the cost of STA embankment construction (estimated at $5 to $6 per embankment cubic yard). The current total length of the STA embankments is approximately 166,250 ft. More STA compartments offer more operational flexibility but they also add more structures, more maintenance, and more construction costs.

The boundaries of Cells 1, 2, and 3 (see Figure 3.1) are defined by the property boundary, Reservoir design, and location of the FPL easements. The area comprising Cells 4 through 7 is the only feasible location to evaluate alternative layouts. To reduce earthwork requirements to fill existing ditches, flow in this area should be in the east/west direction, rather than north/south. This area has a slight slope from north to south, so it is beneficial to break the area up into multiple compartments to minimize the side-to-side topographic variability.

3.3.7 Summary

The area available for the STA cells was subdivided based on the following considerations, in order of importance: 1) the area within the property boundary was used to the maximum extent possible, 2) the Florida Power and Light power lines will not be relocated, 3) the Distribution Canal is to have an overflow weir southeast of Cell 3 which directs flow from the canal to the STA Seepage Collection Canal in case of operator error, 4) the number of STA cells should balance operational flexibility with embankment cost (no cells are in series with other STA cells so that treatment acreage will not be lost if a cell needs to go offline), and 5) Cells 4 through 7 are to have approximately equal areas (940 acres at Elevation 27.25 ft NAVD88) to simplify flow proportioning through the inlet structures.

3.4 Analysis of Total Suspended Solids

In order to evaluate the potential effects of total suspended solids in canal water on the operations of the C-44 Project, the period-of-record discharge (POR) and water quality data for stations in the C-44 Canal were reviewed to determine whether a relationship exists between total suspended solids (TSS) concentration and discharge rate. This analysis was performed in response to comments on the BODR.

3.4.1 Data Summary

POR data were retrieved from the South Florida Water Management District's (SFWMD) DBHYDRO database for the S-308 (upstream) and S-80 (downstream) structures on the C-44 Canal. The S-308 structure regulates flow between Lake Okeechobee and the C-44 Canal in two directions (negative flows are from the C-44 Canal to Lake Okeechobee). The S-80 structure controls releases from the C-44 Canal to the St. Lucie Estuary. TSS and flow data were available for the S-308 structure for the period from 7/16/1981 through 4/17/2006, and for the S-80 structure for the period from 1/19/1979 through 4/13/2006. Dissolved oxygen (DO) and pH data were also retrieved to investigate whether high TSS values could be indicative of algal blooms (elevated pH and DO during daylight hours are caused by CO_2 consumption during photosynthesis). DBHYDRO contained insufficient volatile suspended solids (VSS) and chlorophyll data to further explore a breakdown between algal solids and inorganic solids.

Table 3.4 summarizes the POR flow and water quality data for the S-308 and S-80 structures. Discharge at S-308 averaged 319 cubic feet per second (cfs) and ranged from -4,307 (to Lake Okeechobee) to 8,150 cfs (from Lake Okeechobee). TSS averaged 34 milligrams per liter (mg/L) and ranged from 1 to 541 mg/L. pH averaged 7.78 standard units (s.u.) and ranged from 6.30 to 9.09 s.u. DO averaged 6.87 mg/L and ranged from 0.33 to 12.6 mg/L.

Discharge at S-80 averaged 556 cfs and ranged from 0 to 9,180 cfs. TSS averaged 10 mg/L and ranged from 0.5 to 110 mg/L. TSS concentrations decreased between S-308 and S-80, indicating the effects of in-stream settling or assimilation. pH averaged 7.51 s.u. and ranged from 5.45 to 8.91 s.u. DO averaged 6.20 mg/L and ranged from 0.79 to 12.4 mg/L.

Table 3.4 Period-of-Record Flow and Water Quality Data for the C-44 Canal

Structure	Statistic	Discharge (cfs)	TSS (mg/L)	pH (s.u.)	DO (mg/L)
S-308	Average	319	34	7.78	6.87
	Minimum	-4307	1	6.30	0.33
	Median	0	19	7.82	7.13
	Maximum	8150	541	9.09	12.6
	Standard Deviation	1069	49	0.43	1.89
	Count	8456	420	417	414
S-80	Average	556	10	7.51	6.20
	Minimum	0	0.5	5.45	0.79
	Median	35	5.2	7.51	6.33
	Maximum	9180	110	8.91	12.4
	Standard Deviation	1130	14	0.44	1.83
	Count	9945	380	370	368

3.4.2 Relationships at S-308

Figure 3.5 shows the relationship between discharge rate and TSS concentration at S-308 for flows in both directions. Figure 3.6 shows the relationship between discharge and TSS concentration only for flows in the positive (towards the east) direction. In neither case does there appear to be a strong correlation. It should be noted that residence time in the C-44 Canal is inversely related to discharge rate. At low discharge rates, the residence time in the C-44 is comparatively long and favors the production of algal biomass over the transport of inorganic solids. At high discharge rates, the residence time may be too short to facilitate algal production, but algal solids could be transported from Lake Okeechobee during regulatory releases and high velocities could scour measurable quantities of inorganic solids from the Canal banks and bed.

Figures 3.7 and 3.8 compare TSS concentrations to measurements of DO and pH at S-308. If high TSS concentrations were caused by algal blooms, high values of DO and pH would also be expected concurrently. The figures show that this is not the case. The highest DO concentrations and pH values occurred at TSS concentrations less than 100 mg/L.

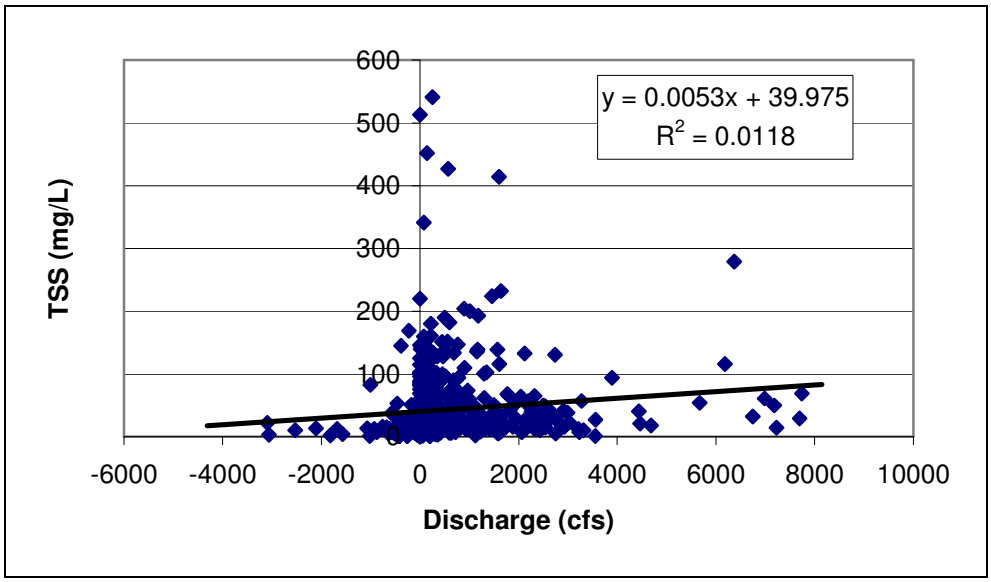


Figure 3.5 Relationship between Discharge and TSS Concentration at S-308

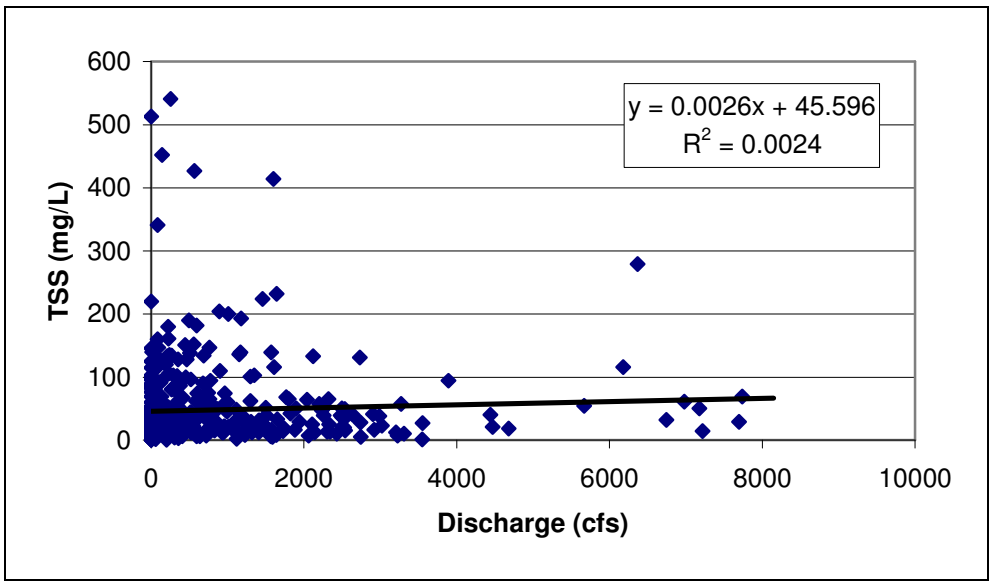


Figure 3.6 Relationship between Positive Discharge and TSS Concentration at S-308

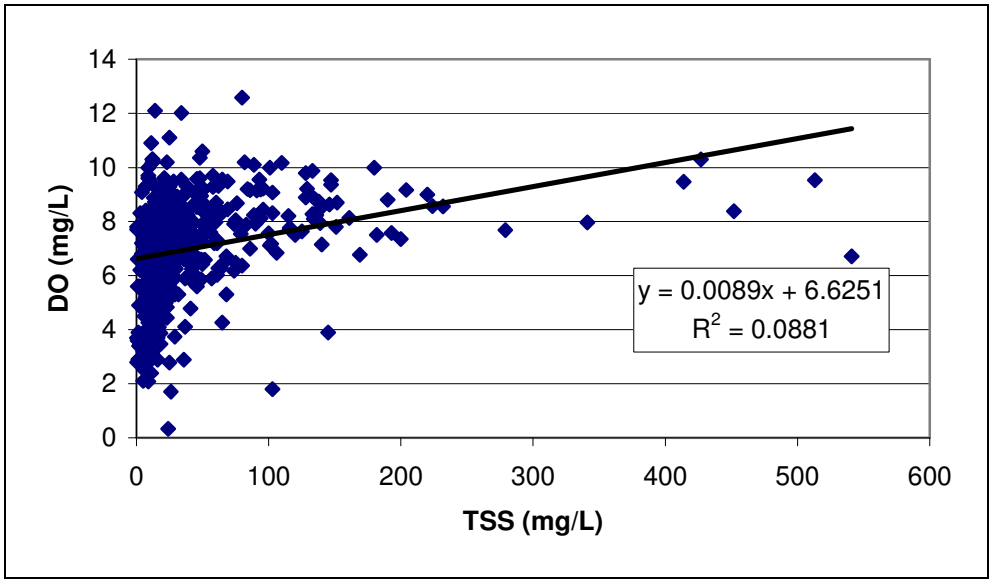


Figure 3.7 Relationship between TSS and Dissolved Oxygen at S-308

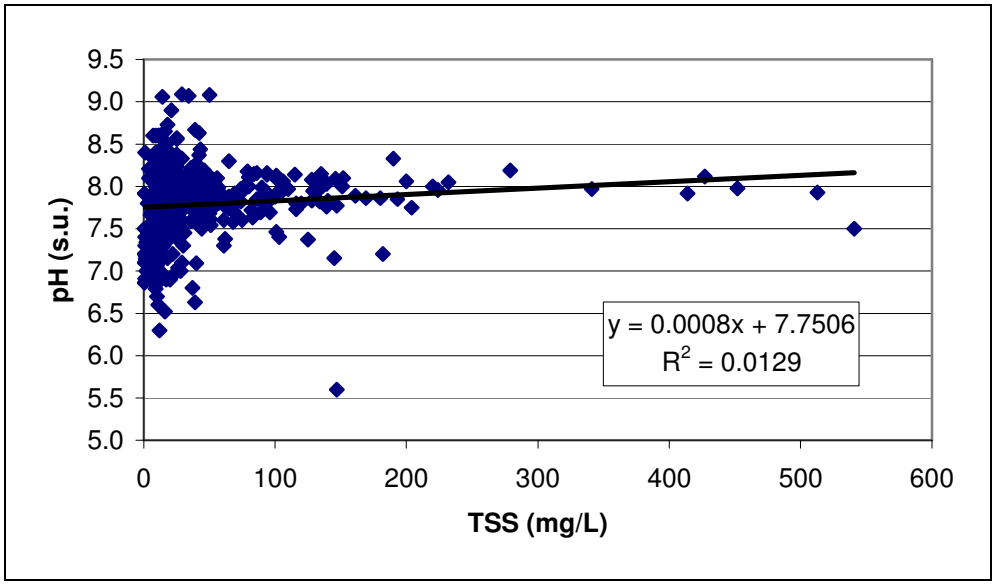


Figure 3.8 Relationship between TSS and pH at S-308

3.4.3 Relationships at S-80

Figure 3.9 shows the relationship between discharge rate and TSS concentration at S-80. There appears to be a stronger relationship at S-80 (r2 = 0.50) than at S-308 (r2 = 0.01). Figures 3.10 and 3.11 compare TSS concentrations to measurements of DO and pH at S-80. Similarly to the results at S-308, these data do not show any apparent correlation between TSS and either DO or pH.

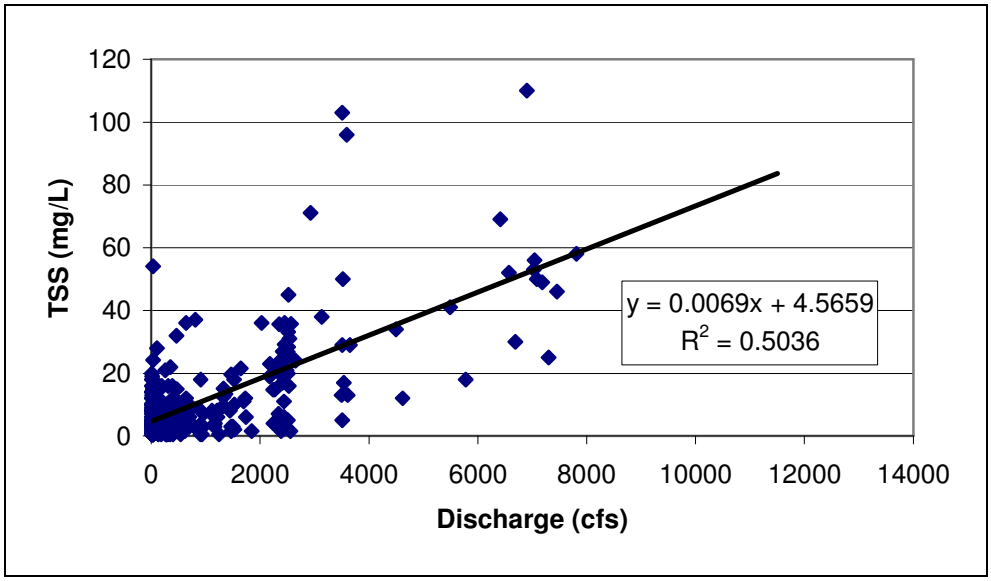


Figure 3.9 Relationship between Discharge and TSS Concentration at S-80

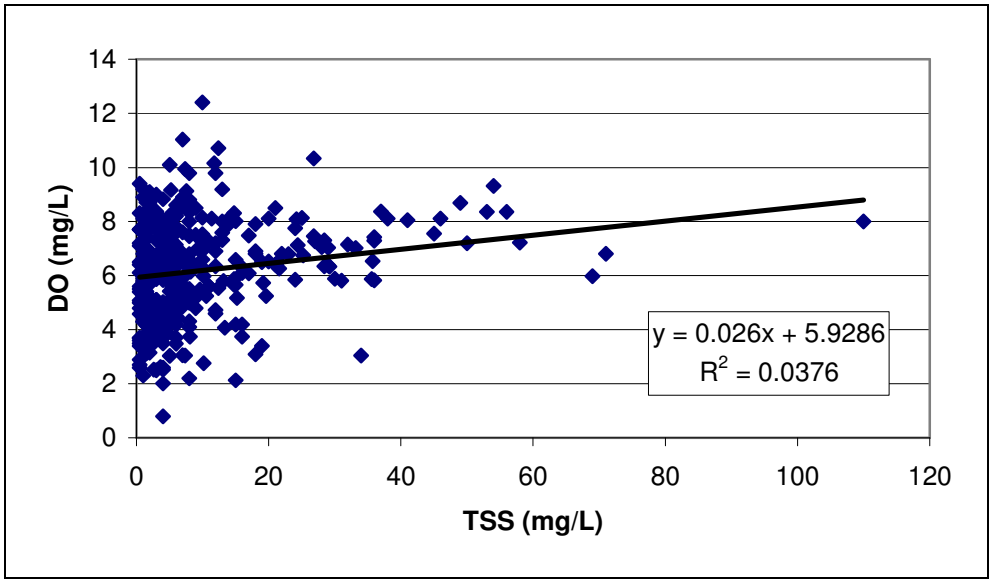


Figure 3.10 Relationship between TSS and Dissolved Oxygen at S-80

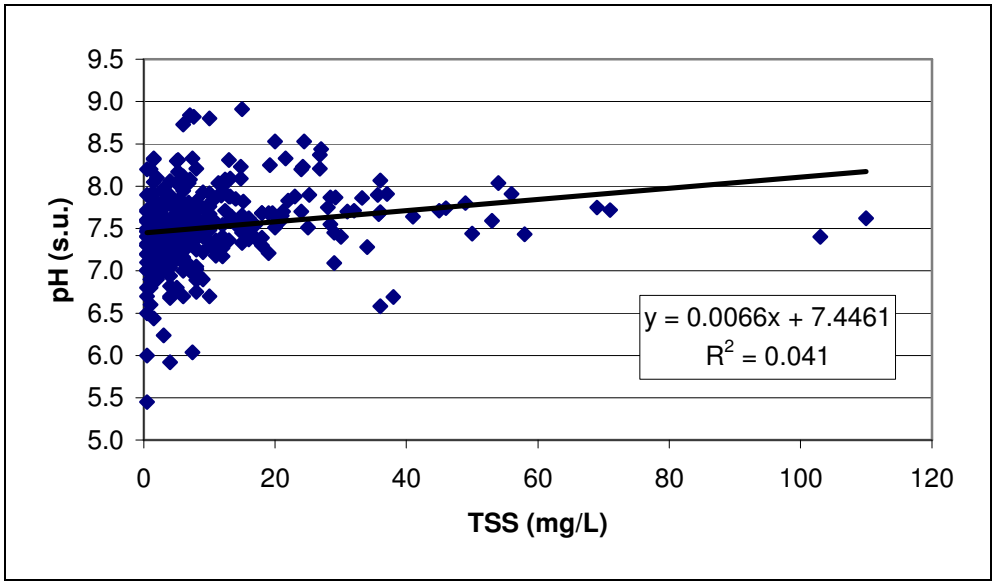


Figure 3.11 Relationship between TSS and pH at S-80

3.4.4 Conclusions and Recommendations

From the analysis described above, the following conclusions and recommendations are offered:

- Based upon simple regression techniques, there does not appear to be a correlation between discharge rate and TSS concentration at S-308. However, there does appear to be a correlation (r2 = 0.5) between discharge and TSS downstream at S-80. The relationship between 7, 14, and 30 day cumulative flows and TSS was examined, but no further significant correlation was detected.
- The evaluation of other water quality parameters (DO and pH) did not result in a clear determination of the types of solids (algal or inorganic) contributing to high TSS concentrations.
- More complex regression techniques may reveal trends or relationships different from those described above.

4.0 GROUNDWATER MODELING

4.1 MODFLOW

Groundwater modeling was performed to evaluate groundwater levels, groundwater mounding, and mass balance (water budget) of the C-44 Project. MODFLOW was selected for the model simulations because of its wide acceptance in the engineering community and because previous MODFLOW models of the project area were available. A more detailed discussion of the original MODFLOW analysis is included in Section 13.0 and Appendix 13.2 in the Final Basis of Design Report (BODR), dated April 14, 2006. The groundwater model was updated for the Preliminary Design Phase (PDP) to reflect changes in the canal and stormwater treatment area (STA) design for the C-44 Reservoir/STA Project.

4.2 Preliminary Design Setup

The objective of the work was to update the "With Project" groundwater model to reflect the new site layout (Figure 3.1). In the updated model, new design water levels for the various canals were incorporated. The elevations of the Reservoir and STA cells did not change from the original "With Project" design because the model simulated steady-state conditions only. However, minor changes to the areal extent of Cell 1, Cell 3, and Cell 7 were completed. In addition, the STA cell south of STA 2 was removed in the updated model based on the new project design. Figure 4.1 shows the boundary conditions for the updated model.

The updated model used the same three layers as in the original BODR model: Layer 1 is silty to clayey fine sand and fine sand/shell, Layer 2 is shell sand to silty fine sand (production zone),and Layer 3 is sand, silt, and shell. The most obvious delineation of subsurface materials encountered at the site is the presence of the predominantly shelly sand and silty sand material. The average depth to the top of Layer 2 is approximately 12 ft; however the depth to the top of the unit varies from about 3 to 23 ft across the site. Beneath Layer 2, slightly clayey, silty fine sand with phosphate is present at depths of approximately 115 to 125 feet below ground surface, and represents the top of the Hawthorn confining unit. The canals were simulated in Layer 1. However, the intake canal was simulated in both Layer 1 and Layer 2 because it is so deeply incised at a specified elevation of 10.6 ft NAVD88, which is the lowest design elevation and would represent the worst-case condition (average ground surface is approximately 26.0 ft NAVD88).

4.2.1 Preliminary Design Results

The C-44 Project groundwater model simulation was run as a steady-state simulation with a full Reservoir (15 ft of water) and 1.5 ft of water in the STA cells. These conditions represent the highest expected operational water levels and will have the potential for the greatest impact to the groundwater flow regime. Table 4.1 shows the net flux of groundwater discharging to each canal. For the Reservoir and STA cells, the net flux is positive, indicating that water flows from the canals to the

aquifer. The mass balance from the MODFLOW simulation indicates a total seepage loss of approximately 0.14 in per day (in/day) from the reservoir, and approximately 0.05 in/day from the STA cells, when the reservoir and STA cells are at maximum pool.

Figures 4.2 and 4.3 show the model-predicted potentiometric water surface contours for layers 1 and 2 associated with each layer. The results indicate that slight groundwater mounding attributable to the reservoir and STA extends approximately 2,000 feet beyond the Reservoir seepage collection canals to the north and west. The modeling also indicates that in the immediate vicinity of the intake canal, water will drain from the surrounding aquifers into the canal, resulting in a net reduction of water levels immediately adjacent to the canal outside of the project area. The intake canal will potentially be drawn down to elevations as low as 10.6 ft NAVD 88, which is the condition simulate and would be the worst-case condition. Figure 4.4 shows the effects of the project on the surifical aquifer water levels, with positive number indicating drawdown, and negative numbers indicating groundwater mounding.

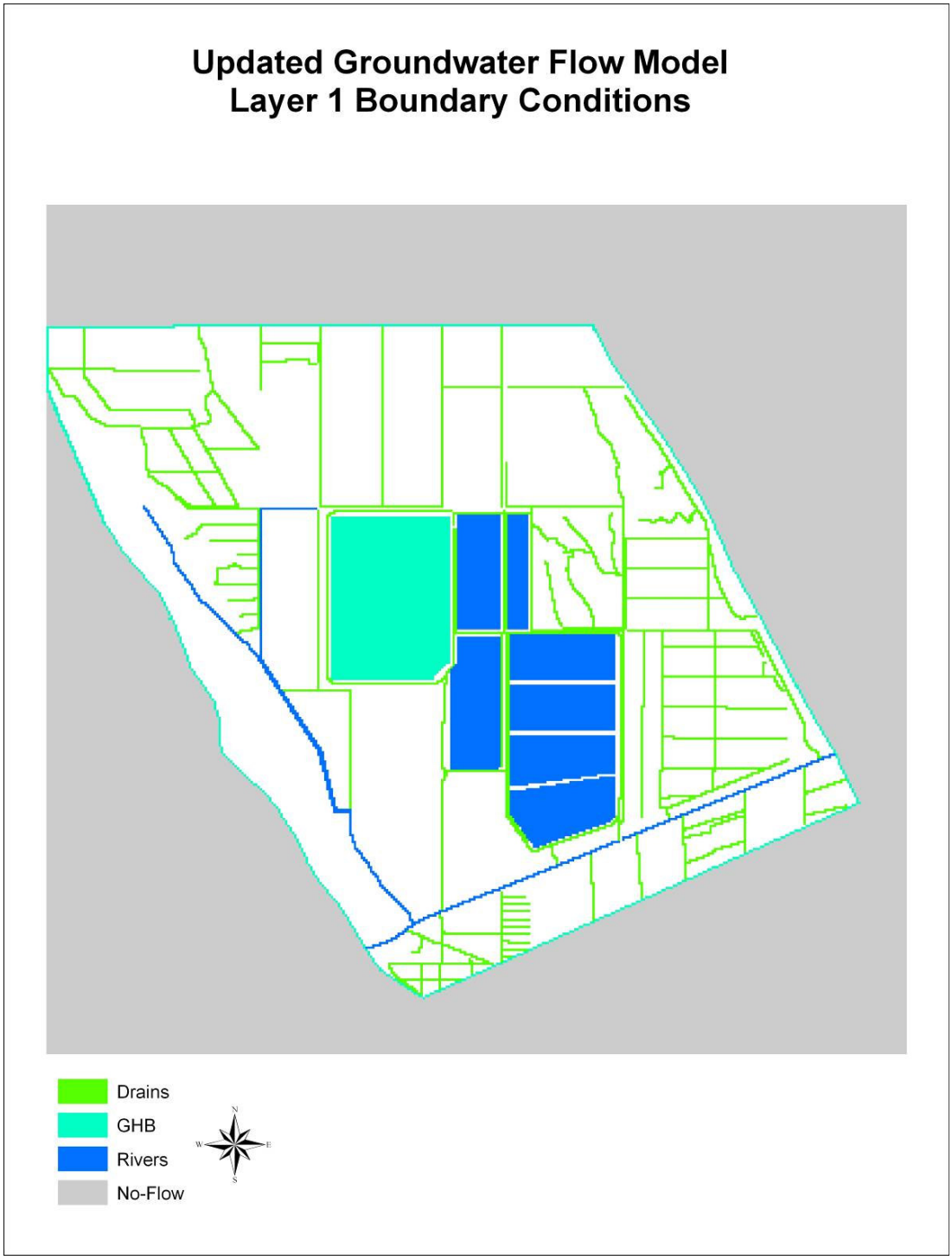


Figure 4.1 Preliminary Design MODFLOW Boundary Conditions for Layer 1

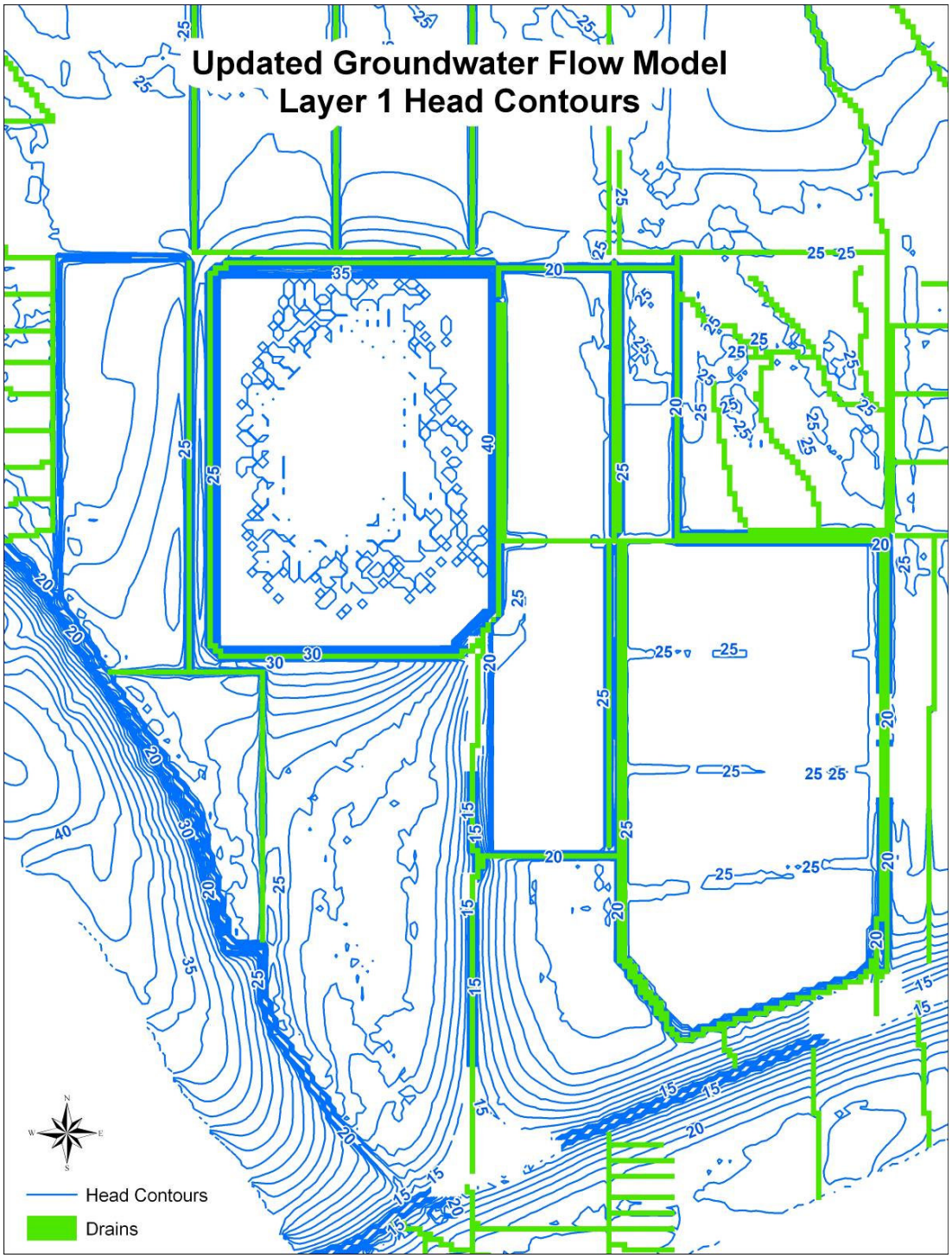


Figure 4.2 Preliminary Design MODFLOW Potentiometric Surface for Layer 1

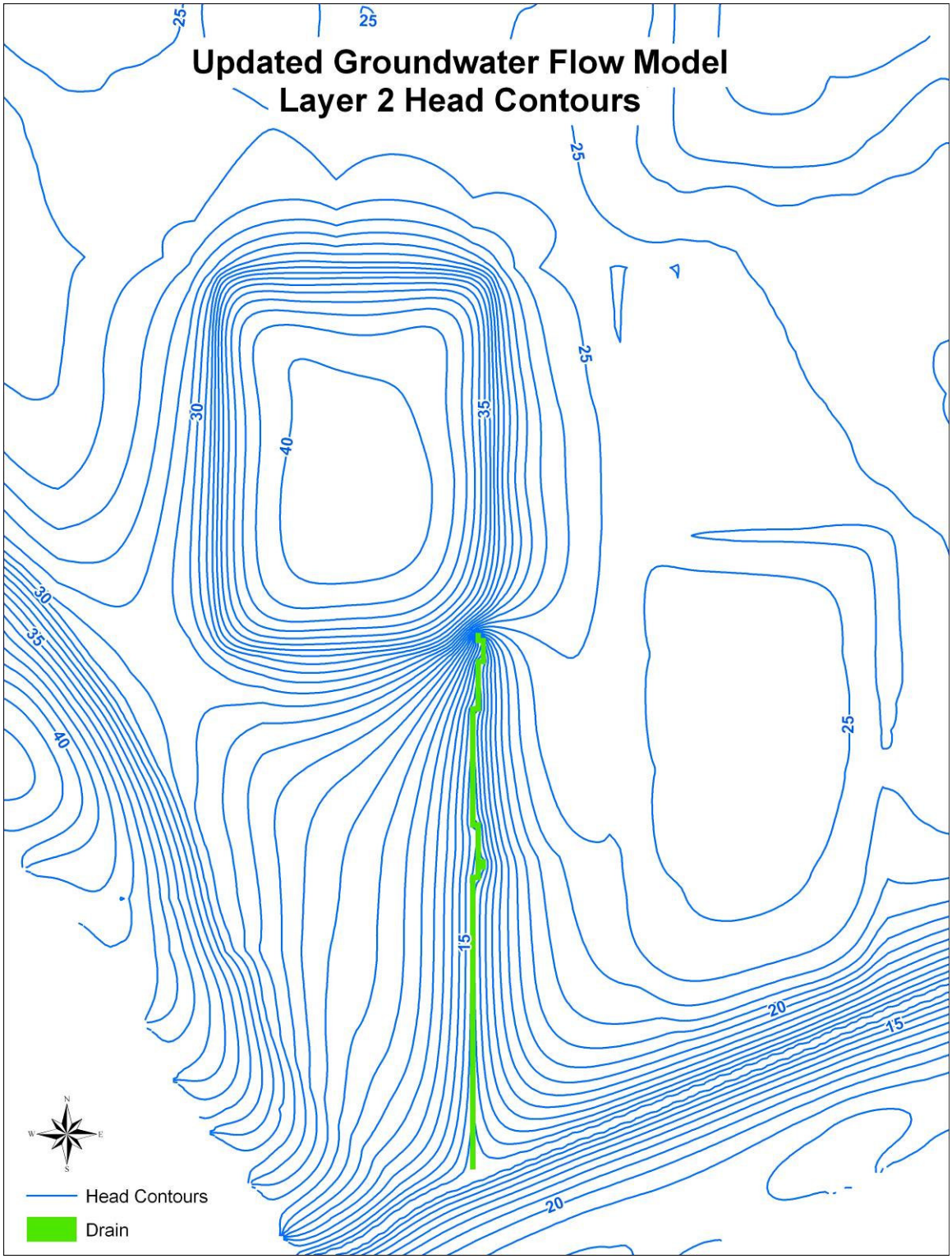


Figure 4.3 Preliminary Design MODFLOW Potentiometric Surface for Layer 2

Figure 4.4 MODFLOW Drawdown and Mounding for Layer 2

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Core Boring Logs

Boring Designation CB-367

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-367
LOCATION COORDINATES	X = 832,078 Y = 1,011,988
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	22.5 Ft.
15. DATE BORING	STARTED 05-03-06 / COMPLETED 05-03-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, few plant debris, 10YR 3/2 very dark grayish brown (SM)	NR	1		SPT Sampler 24.0	3 2 2 2	4
22.0	4.0		SAND, clayey, 10YR 3/1 very dark gray (SC)	NR	2		SPT Sampler 22.0	2 3 4 6	7
19.0	7.0		SAND, silty, wet, 10YR 5/1 gray (SM)	NR	3		SPT Sampler 20.0	3 4 5 5	9
				NR	4		SPT Sampler 18.0	4 8 14 13	22
16.0	10.0		SAND, poorly-graded with silt, some shell, wet, 10YR 7/1 light gray (SP-SM) From El. 18.0 to 16.0 Ft., some shell, moist, 10YR 6/1 gray	NR	5		SPT Sampler 16.5	11 22 46	68
							Advanced Boring 16.0		
15.0	11.0		LIMESTONE, coquina, hard, coarse-grained, 10YR 7/1 light gray	NR	6		SPT Sampler 15.0	50/2	
			SAND, poorly-graded with silt, mostly shell, percent fines 12 to 14 ft bls = 5.0%, 10YR 6/1 gray (SP-SM)				Advanced Boring 14.0		
				NR	7		SPT Sampler 12.0	7 9 9 7	18
			From El. 12.0 to 7.5 Ft., mostly shell, moist, 10YR 6/1 gray	NR	8		SPT Sampler	5 12	

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Initial Data Entry Checked
Geology/Hydrostructure Checked
Database/Template Checked

(Continued)

Boring Designation CB-367

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 832,078 Y = 1,011,988	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	13 15	25
							Advanced Boring 7.5		
			From El. 7.5 to 2.5 Ft., moist, 10YR 6/1 gray	NR	9		SPT Sampler 6.0	7 11 12	23
							Advanced Boring 2.5		
2.5	23.5		SAND, silty, little shell, wet, 10YR 6/1 gray (SM)	NR	10		SPT Sampler 1.0	6 6 9	15
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., wet, 10YR 6/1 gray	NR	11		SPT Sampler -4.0	6 8 12	20
							Advanced Boring -7.5		
			From El. -7.5 to -12.5 Ft., some shell, wet, 10YR 6/1 gray	NR	12		SPT Sampler -9.0	5 5 5	10

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-367

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 3 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 832,078 Y = 1,011,988	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -15.0 Ft., some shell, wet, 10YR 6/1 gray	NR	13		SPT Sampler -14.0	7 11 13	24
							Advanced Boring -17.5		
-17.5	43.5		SAND, clayey, soft, few shell, percent fines 48.5 to 50 ft bls = 47.0%, 10YR 6/1 gray (SC)	NR	14		SPT Sampler -19.0	2 2 3	5
							Advanced Boring -22.5		
				NR	15		SPT Sampler -24.0	2 1 3	4
							Advanced Boring -27.5		
-27.5	53.5		SAND, silty, few shell, wet, 10YR 7/1 light gray (SM)	NR	16		SPT Sampler -29.0	17 19 18	37

35 40 45 50 55

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-367

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 832,078 Y = 1,011,988	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring		
-37.5	63.5		SAND, clayey, few shell, percent fines 58.5 to 60 ft bls = 46.8%, 10YR 6/1 gray (SC)	NR	17		SPT Sampler -32.5 / -34.0	2 2 3	5
							Advanced Boring		
-42.5	68.5		SAND, silty, few shell, 10YR 7/1 light gray (SM)	NR	18		SPT Sampler -37.5 / -39.0	7 12 19	31
							Advanced Boring		
-49.0	75.0		SAND, poorly-graded with silt, some shell, 10YR 7/1 light gray (SP-SM)	NR	19		SPT Sampler -42.5 / -44.0	7 7 13	20
							Advanced Boring		
			From El. -47.5 to -49.0 Ft., some shell, wet, 10YR 7/1 light gray	NR	20		SPT Sampler -47.5 / -49.0	5 9 7	16

55 60 65 70 75

DRAFT
Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-367

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 832,078 Y = 1,011,988	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-368

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-368
LOCATION COORDINATES	X = 834,117 Y = 1,011,987
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 05-04-06 / COMPLETED 05-04-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, clayey, few shell, 10YR 8/2 very pale brown (SC)	NR	1		SPT Sampler	7, 8, 6, 5	14
			From El. 24.0 to 22.0 Ft., few shell, 10YR 6/3 pale brown	NR	2		SPT Sampler	4, 6, 9, 11	15
22.0	4.0						22.0		
			SAND, silty, few clay, trace shell, percent fines 4 to 6 ft bls = 18.6%, 10YR 6/1 gray (SM)	NR	3		SPT Sampler	5, 7, 13, 16	20
			From El. 20.0 to 18.0 Ft., 10YR 7/1 light gray	NR	4		SPT Sampler	8, 9, 13, 10	22
18.0	8.0						18.0		
			SAND, poorly-graded with silt, some fine-grained sand-sized shell, wet, 10YR 8/1 white (SP-SM)	NR	5		SPT Sampler	7, 11, 17, 19	28
			From El. 16.0 to 14.0 Ft., some shell, moist, 10YR 6/3 pale brown	NR	6		SPT Sampler	7, 12, 16, 20	28
			From El. 14.0 to 12.0 Ft., some shell, moist, 10YR 6/1 gray	NR	7		SPT Sampler	15, 29, 35, 36	64
12.0	14.0						12.0		
			SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, wet, 10YR 6/1 gray (SP)	NR	8		SPT Sampler	15, 33	

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Geology/Nomenclature Checked
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Boring Designation CB-368

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 834,117 Y = 1,011,987	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	38 / 36	71
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 6/1 gray (SP-SM)	NR	9		SPT Sampler	5 / 7 / 7	14
							6.0 Advanced Boring		
2.5	23.5		SAND, poorly-graded, little shell, 10YR 6/1 gray (SP)	NR	10		SPT Sampler	22 / 24 / 28	52
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., few shell, 10YR 6/1 gray	NR	11		SPT Sampler	25 / 25 / 27	52
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., few shell, 10YR 6/1 gray	NR	12		SPT Sampler	20 / 50/5	
							-9.0		

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-368

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 834,117 Y = 1,011,987	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., few shell, 10YR 6/1 gray	NR	13		SPT Sampler	17 / 16 / 10	26
							-14.0		
							Advanced Boring		
							-17.5		
			From El. -17.5 to -22.5 Ft., few shell, wet, 10YR 6/1 gray	NR	14		SPT Sampler	7 / 7 / 8	15
							-19.0		
							Advanced Boring		
-22.5	48.5						-22.5		
			SAND, clayey, trace shell, wet, percent fines 48.5 to 50 ft bls = 30.1%, 10YR 4/1 dark gray (SC)	NR	15		SPT Sampler	2 / 2 / 2	4
							-24.0		
							Advanced Boring		
-27.5	53.5						-27.5		
			CLAY, lean, very soft, few shell, wet, 10YR 6/1 gray (CL)	NR	16		SPT Sampler	3 / 3 / 6	9
							-29.0		

35 40 45 50 55

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Geology/Nomenclature Checked
Material/Data Entry Checked

Boring Designation CB-368

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 834,117 Y = 1,011,987	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring		
-34.0			SAND, clayey, soft, few shell, percent fines 58.5 to 60 ft bls = 45.2%, 10YR 6/1 gray (SC)	NR	17		SPT Sampler	2 1 2	3
-37.5	63.5						Advanced Boring		
-39.0			SAND, poorly-graded with silt, some shell, percent fines 63.5 to 65 ft bls = 5.1%, 10YR 6/1 gray (SP-SM)	NR	18		SPT Sampler	11 13 15	28
-42.5							Advanced Boring		
-44.0			From El. -42.5 to -47.5 Ft., some shell, 10YR 7/1 light gray	NR	19		SPT Sampler	8 11 13	24
-47.5	73.5						Advanced Boring		
-49.0	75.0		SAND, poorly-graded, some shell, 10YR 6/1 gray (SP)	NR	20		SPT Sampler	NR NR NR	

55 60 65 70 75

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-368

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 834,117 Y = 1,011,987	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Boring Designation CB-369

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-369
LOCATION COORDINATES	X = 837,230 Y = 1,011,943
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-05-06 / COMPLETED 05-05-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, 10YR 7/3 very pale brown (SM)	NR	1		SPT Sampler	5 4 5 5	9
22.0	4.0		SAND, clayey, trace shell, 10YR 7/1 light gray (SC)	NR	2		SPT Sampler	4 6 9 10	15
20.0	6.0		From El. 22.0 to 20.0 Ft., firm, trace shell, percent fines = 19.2%, 10YR 7/1 light gray	NR	3		SPT Sampler	5 4 5 7	9
18.0	8.0		SAND, silty, 10YR 5/1 gray (SM)	NR	4		SPT Sampler	15 13 10 9	23
16.0	10.0		From El. 18.0 to 16.0 Ft., trace shell, wet, 10YR 5/1 gray	NR	5		SPT Sampler	10 13 15 10	28
14.0	12.0		SAND, poorly-graded with silt, some shell, wet, 10YR 7/3 very pale brown (SP-SM)	NR	6		SPT Sampler	6 8 17 18	25
12.0	14.0		SAND, poorly-graded, mostly shell, wet, 10YR 6/3 pale brown (SP)	NR	7		SPT Sampler	11 17 22 25	39
			SAND, poorly-graded with silt, some shell, 10YR 6/2 light brownish gray (SP-SM)	NR	8		SPT Sampler	9 11	

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☐ Database/Template Checked

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Boring Designation CB-369

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 837,230 Y = 1,011,943	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	13 / 14	24
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, some shell, wet, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	18 / 20 / 26	46
							Advanced Boring 2.5		
2.5	23.5		SAND, poorly-graded with silt, moist, 10YR 5/1 gray (SP-SM)	NR	10		SPT Sampler 1.0	17 / 29 / 33	62
							Advanced Boring -2.5		
-2.5	28.5		SAND, poorly-graded, some shell, 10YR 5/1 gray (SP)	NR	11		SPT Sampler -4.0	26 / 24 / 22	46
							Advanced Boring -7.5		
			From El. -7.5 to -12.5 Ft., few shell, wet, 10YR 5/1 gray	NR	12		SPT Sampler -9.0	8 / 11 / 11	22

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Initial/Data Entry Checked

Boring Designation CB-369

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 837,230 Y = 1,011,943	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., few shell, wet, 10YR 5/1 gray	NR	13		SPT Sampler -14.0	5 4 4	8
-17.5	43.5						Advanced Boring -17.5		
			SAND, clayey, trace shell, moist, percent fines 43.5 to 45 ft bls = 30.8%, 10YR 5/1 gray (SC)	NR	14		SPT Sampler -19.0	4 4 5	9
-22.5	48.5						Advanced Boring -22.5		
			GRAVEL, silty, wet, moderate cementation, 10YR 7/1 light gray (GM)	NR	15		SPT Sampler -24.0	27 10 7	17
-27.5	53.5						Advanced Boring -27.5		
			SAND, clayey, soft, few shell, moist, percent fines 53.5 to 55 ft bls = 33.8%, 10YR 5/1 gray (SC)	NR	16		SPT Sampler -29.0	2 2 3	5

35 40 45 50 55

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-369

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 837,230 Y = 1,011,943	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-32.5		
			From El. -32.5 to -37.5 Ft., soft, few shell, moist, 10YR 5/1 gray	NR	17		SPT Sampler	4 / 3 / 3	6
							-34.0		
							Advanced Boring		
-37.5	63.5						-37.5		
			CLAY, lean, soft, moist, percent fines 63.5 to 65 ft bls = 75.5%, 10YR 4/1 dark gray (CL)	NR	18		SPT Sampler	2 / 2 / 1	3
							-39.0		
							Advanced Boring		
-42.5	68.5						-42.5		
			SAND, poorly-graded, some shell, wet, 10YR 5/1 gray (SP)	NR	19		SPT Sampler	9 / 11 / 13	24
							-44.0		
							Advanced Boring		
							-47.5		
			From El. -47.5 to -49.0 Ft., few shell, 10YR 4/1 dark gray	NR	20		SPT Sampler	6 / 7 / 9	16
-49.0	75.0						-49.0		

55 60 65 70 75

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-369

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 837,230 Y = 1,011,943	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
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85
90
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Database/Template Checked

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Boring Designation CB-370

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT: C-44 Reservoir/STA Project	9. SIZE AND TYPE OF BIT
	10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.) — HORIZONTAL: NAD 83 — VERTICAL: NAVD88
2. BORING DESIGNATION: CB-370 — LOCATION COORDINATES: X = 840,336 Y = 1,011,960	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-55 (land-based) — ☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams — CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES — DISTURBED: 20 — UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG. FROM VERTICAL: — BEARING:	14. ELEVATION GROUND WATER: 19.0 Ft.
	15. DATE BORING — STARTED: 05-04-06 — COMPLETED: 05-04-06
6. THICKNESS OF OVERBURDEN: N/A	16. ELEVATION TOP OF BORING: 26.0 Ft.
7. DEPTH DRILLED INTO ROCK: N/A	17. TOTAL RECOVERY FOR BORING: Not Recorded
8. TOTAL DEPTH OF BORING: 75.0 Ft.	18. SIGNATURE AND TITLE OF INSPECTOR: ,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, 10YR 2/2 very dark brown (SM)	NR	1		SPT Sampler 24.0	5, 6, 6, 3	12
			SAND, clayey, 10YR 2/2 very dark brown (SC)	NR	2		SPT Sampler 22.0	3, 5, 6, 7	11
20.0	6.0		From El. 22.0 to 20.0 Ft., 10YR 2/2 very dark brown	NR	3		SPT Sampler 20.0	7, 7, 10, 13	17
18.0	8.0		SAND, silty, percent fines 6 to 8 ft bls = 17.3%, 10YR 5/1 gray (SM)	NR	4		SPT Sampler 18.0	7, 6, 7, 9	13
16.0	10.0		SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)	NR	5		SPT Sampler 16.0	9, 7, 9, 9	16
14.0	12.0		SAND, silty, mostly shell, 10YR 5/1 gray (SM)	NR	6		SPT Sampler 14.0	15, 21, 37, 42	58
			SAND, poorly-graded, little shell, moist, 10YR 5/1 gray (SP)	NR	7		SPT Sampler 12.0	4, 3, 21, 33	24
			From El. 12.0 to 7.5 Ft., few shell, wet, 10YR 5/1 gray	NR	8		SPT Sampler	15, 26	

0 5 10 15

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Boring Designation CB-370

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,336 Y = 1,011,960	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	30	56
							10.0		
							Advanced Boring		
							7.5		
			From El. 7.5 to 2.5 Ft., mostly shell, wet, 10YR 5/1 gray	NR	9		SPT Sampler	22 / 27 / 22	49
							6.0		
							Advanced Boring		
							2.5		
			From El. 2.5 to -2.5 Ft., wet, 10YR 5/1 gray	NR	10		SPT Sampler	14 / 23 / 33	56
							1.0		
							Advanced Boring		
							-2.5		
			From El. -2.5 to -7.5 Ft., wet, 10YR 5/1 gray	NR	11		SPT Sampler	17 / 21 / 18	39
							-4.0		
							Advanced Boring		
							-7.5		
			From El. -7.5 to -12.5 Ft., few shell, wet, 10YR 5/1 gray	NR	12		SPT Sampler	9 / 13 / 11	24
							-9.0		

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-370

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,336 Y = 1,011,960	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	13		SPT Sampler -14.0	13 18 23	41
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., trace shell, moist, 10YR 5/1 gray	NR	14		SPT Sampler -19.0	14 17 21	38
-22.5	48.5						Advanced Boring -22.5		
			SAND, poorly-graded with silt, wet, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler -24.0	7 8 16	24
-27.5	53.5						Advanced Boring -27.5		
			SAND, clayey, soft, some fine to coarse-grained sand-sized shell, moist, percent fines 53.5 to 55 ft bls = 31.1%, 10YR 5/1 gray (SC)	NR	16		SPT Sampler -29.0	2 5 5	10

35 40 45 50 55

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Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

Boring Designation CB-370

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,336 Y = 1,011,960	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -32.5		
				NR	17		SPT Sampler -34.0	5 3 2	5
							Advanced Boring -37.5		
			From El. -37.5 to -42.5 Ft., wet, 10YR 5/1 gray	NR	18		SPT Sampler -39.0	4 3 6	9
							Advanced Boring -42.5		
-42.5	68.5		SILT, inorganic-L, soft, wet, percent fines 68.5 to 70 ft bls = 90.4%, 10YR 7/1 light gray (ML)	NR	19		SPT Sampler -44.0	8 6 8	14
							Advanced Boring -47.5		
-47.5	73.5		SAND, silty, few shell, 10YR 5/1 gray (SM)	NR	20		SPT Sampler -49.0	10 13 19	32
-49.0	75.0								

55 60 65 70 75

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-370

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,336 Y = 1,011,960	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-371

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT: C-44 Reservoir/STA Project	9. SIZE AND TYPE OF BIT
	10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.) — HORIZONTAL: NAD 83 — VERTICAL: NAVD88
2. BORING DESIGNATION: CB-371 — LOCATION COORDINATES: X = 841,491 Y = 999,673	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-55 (land-based) — ☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams — CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES — DISTURBED: 20 — UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG. FROM VERTICAL: — BEARING:	14. ELEVATION GROUND WATER: 17.0 Ft.
	15. DATE BORING — STARTED: 05-10-06 — COMPLETED: 05-10-06
6. THICKNESS OF OVERBURDEN: N/A	16. ELEVATION TOP OF BORING: 26.0 Ft.
7. DEPTH DRILLED INTO ROCK: N/A	17. TOTAL RECOVERY FOR BORING: Not Recorded
8. TOTAL DEPTH OF BORING: 75.0 Ft.	18. SIGNATURE AND TITLE OF INSPECTOR: ,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, poorly-graded, 10YR 7/1 light gray (SP)	NR	1		SPT Sampler	2, 3, 5, 4	8
24.0	2.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	2		24.0 SPT Sampler	2, 2, 2, 2	4
			From El. 22.0 to 20.0 Ft., 5GY 5/1 greenish gray	NR	3		22.0 SPT Sampler	3, 5, 7, 8	12
			From El. 20.0 to 18.0 Ft., percent fines 6 to 8 ft bls = 31.9%, 5GY 6/1 greenish gray	NR	4		20.0 SPT Sampler	4, 6, 7, 10	13
			From El. 18.0 to 16.0 Ft., few rounded sandstone up to 1/4, 10YR 8/1 white	NR	5		18.0 SPT Sampler	9, 10, 15, 11	25
			From El. 16.0 to 14.0 Ft., 5GY 6/1 greenish gray	NR	6		16.0 SPT Sampler	8, 7, 11, 13	18
			From El. 14.0 to 12.0 Ft., few shell, 10YR 7/1 light gray	NR	7		14.0 SPT Sampler	4, 4, 3, 2	7
			From El. 12.0 to 7.5 Ft., little shell, 10YR 5/1 gray	NR	8		12.0 SPT Sampler	2, 3	

0 5 10 15

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Boring Designation CB-371

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,491 Y = 999,673	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	4 / 4	7
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded with silt, some fine-grained sand-sized shell, 10YR 4/1 dark gray (SP-SM)	NR	9		SPT Sampler	6 / 10 / 11	21
							6.0 Advanced Boring		
3.5	22.5		LIMESTONE, sandy, hard, medium-grained, 10YR 5/1 gray				2.5		
				NR	10		2.0 SPT Sampler	50/2	
							Advanced Boring		
-1.5	27.5		SAND, poorly-graded, 10YR 5/1 gray (SP)				-2.5		
			From El. -2.5 to -7.5 Ft., 10YR 5/1 gray	NR	11		SPT Sampler	25 / 26 / 29	55
							-4.0 Advanced Boring		
			From El. -7.5 to -11.5 Ft., 10YR 5/1 gray				-7.5		
				NR	12		SPT Sampler	14 / 16 / 18	34
							-9.0		

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Database/Template Checked

Boring Designation CB-371

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,491 Y = 999,673	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring		
-17.5	43.5		SAND, poorly-graded with silt, some shell, wet, 10YR 5/1 gray (SP-SM)	NR	13		SPT Sampler	18 / 14 / 14	28
-22.5	48.5		SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	14		SPT Sampler	6 / 5 / 3	8
			SAND, clayey, soft, some shell, moist, percent fines 48.5 to 50 ft bls = 21.8%, 10YR 5/1 gray (SC)	NR	15		SPT Sampler	3 / 2 / 2	4
			From El. -27.5 to -32.5 Ft., soft, some shell, moist, percent fines 53.5 to 55 ft bls = 19.7%, 10YR 5/1 gray	NR	16		SPT Sampler	3 / 3 / 3	6

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-371

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,491 Y = 999,673	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-32.5		
			From El. -32.5 to -37.5 Ft., very soft, some shell, moist, 10YR 5/1 gray	NR	17		SPT Sampler	5 4 4	8
							-34.0		
							Advanced Boring		
-37.5	63.5						-37.5		
			SAND, silty, some shell, 10YR 7/1 light gray (SM)	NR	18		SPT Sampler	6 7 7	14
							-39.0		
							Advanced Boring		
-42.5	68.5						-42.5		
			SAND, poorly-graded with silt, some shell, 10YR 7/1 light gray (SP-SM)	NR	19		SPT Sampler	6 7 11	18
							-44.0		
							Advanced Boring		
							-47.5		
			From El. -47.5 to -49.0 Ft., some shell, 10YR 7/1 light gray	NR	20		SPT Sampler	13 13 12	25
-49.0	75.0						-49.0		

55 60 65 70 75

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Boring Designation CB-371

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,491 Y = 999,673	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Boring Designation CB-372

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-372
LOCATION COORDINATES	X = 841,454 Y = 1,000,700
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 15 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-10-06 / COMPLETED 05-10-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 5/4 yellowish brown (SM)	NR	1		SPT Sampler	8 7 6 5	13
			From El. 24.0 to 22.0 Ft., 10YR 3/4 dark yellowish brown	NR	2		24.0 SPT Sampler	6 4 6 10	10
22.0	4.0						22.0		
			SAND, clayey, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	5 7 10 8	17
			From El. 20.0 to 18.0 Ft., 10YR 5/1 gray	NR	4		20.0 SPT Sampler	12 9 11 9	20
			From El. 18.0 to 16.0 Ft., 10YR 5/1 gray	NR	5		18.0 SPT Sampler	10 6 7 5	13
			From El. 16.0 to 14.0 Ft., percent fines 8 to 10 ft bls = 25.1%, 10G 6/1 greenish gray	NR	6		16.0 SPT Sampler	4 4 6 5	10
14.0	12.0						14.0		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	7		SPT Sampler	10 17 17 24	34
12.0	14.0						12.0		
			SAND, silty, 10YR 6/3 pale brown (SM)	NR	8		SPT Sampler	6 9	

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Database/Template Checked

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Boring Designation CB-372

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,454 Y = 1,000,700	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	25 / 17	34
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, wet, 10YR 4/1 dark gray (SP)	NR	9		SPT Sampler 6.0	6 / 4 / 5	9
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., mostly fine to coarse-grained sand-sized shell, moist, 10YR 4/1 dark gray	NR	10		SPT Sampler 1.0	10 / 11 / 20	31
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., mostly fine to coarse-grained sand-sized shell, moist, 10YR 4/1 dark gray	NR	11		SPT Sampler -4.0	15 / 13 / 20	33
							Advanced Boring -7.5		
-7.5	33.5		SAND, poorly-graded with silt, little shell, wet, 10YR 5/1 gray (SP-SM)	NR	12		SPT Sampler -9.0	15 / 18 / 25	43

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-372

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,454 Y = 1,000,700	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., 10YR 5/1 gray	NR	13		SPT Sampler -14.0	11 18 17	35
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., trace shell, moist, 10YR 5/1 gray	NR	14		SPT Sampler -19.0	13 14 16	30
							Advanced Boring -22.5		
-22.5	48.5		SAND, clayey, soft, few shell, wet, 10YR 5/1 gray (SC)	NR	15		SPT Sampler -24.0	2 2 5	7
-24.0	50.0								

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Boring Designation CB-373

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-373
LOCATION COORDINATES	X = 841,454 Y = 1,001,685
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-10-06 / COMPLETED 05-10-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 6/6 brownish yellow (SM)	NR	1		SPT Sampler	7 7 7 6	14
			From El. 24.0 to 21.5 Ft., few rounded limestone up to 1/8, 10YR 6/6 brownish yellow	NR	2		SPT Sampler	6 5 7 10	12
21.5	4.5						22.0		
			SAND, clayey, 10GY 5/1 greenish gray (SC)	NR	3		SPT Sampler	5 7 7 7	14
			From El. 19.5 to 18.0 Ft., few rounded sandstone up to 1/8, 10GY 5/1 greenish gray ▼	NR	4		SPT Sampler	5 14 13 9	27
18.0	8.0						18.0		
			SAND, silty, some shell, wet, 10YR 7/3 very pale brown (SM)	NR	5		SPT Sampler	8 10 12 17	22
			From El. 16.0 to 14.0 Ft., some shell, moist, 10YR 7/3 very pale brown	NR	6		SPT Sampler	2 5 5 7	10
14.0	12.0						14.0		
			SAND, poorly-graded, moist, 10YR 6/3 pale brown (SP)	NR	7		SPT Sampler	16 20 21 23	41
12.0	14.0						12.0		
			SAND, silty, moist, 10YR 6/3 pale brown (SM)	NR	8		SPT Sampler	2 5	

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☐ Database/Template Checked

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Boring Designation CB-373

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,454 Y = 1,001,685	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	9 / 30	14
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, some shell, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	5 / 14 / 26	40
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., some shell, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	21 / 29 / 25	54
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., some shell, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	21 / 24 / 26	50
							Advanced Boring -7.5		
-7.5	33.5		SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	12		SPT Sampler -9.0	11 / 15 / 23	38

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Initial/Data Entry Checked

Boring Designation CB-373

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,454 Y = 1,001,685	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
-12.5	38.5		SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	13		-12.5 SPT Sampler	6 5 7	12
							-14.0 Advanced Boring		
-17.5	43.5		SAND, poorly-graded, mostly shell, wet, 10YR 5/1 gray (SP)	NR	14		-17.5 SPT Sampler	7 9 6	15
							-19.0 Advanced Boring		
			From El. -22.5 to -27.5 Ft. mostly shell, wet, 10YR 5/1 gray	NR	15		-22.5 SPT Sampler	7 9 6	15
							-24.0 Advanced Boring		
-27.5	53.5		SAND, poorly-graded with silt, little shell, wet, 10YR 5/1 gray (SP-SM)	NR	16		-27.5 SPT Sampler	7 6 10	16
							-29.0		

35 40 45 50 55

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Boring Designation CB-373

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,454 Y = 1,001,685	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-32.5		
			From El. -32.5 to -37.5 Ft., wet, 10YR 5/1 gray	NR	17		SPT Sampler	6 / 5 / 7	12
							-34.0		
							Advanced Boring		
							-37.5		
			From El. -37.5 to -42.5 Ft., some shell, wet, 10YR 5/1 gray	NR	18		SPT Sampler	10 / 10 / 10	20
							-39.0		
							Advanced Boring		
							-42.5		
			From El. -42.5 to -47.5 Ft., some shell, wet, 10YR 7/1 light gray	NR	19		SPT Sampler	10 / 13 / 16	29
							-44.0		
							Advanced Boring		
							-47.5		
			From El. -47.5 to -49.0 Ft., moist, 10YR 7/1 light gray	NR	20		SPT Sampler	12 / 14 / 18	32
-49.0	75.0						-49.0		

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-373

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,454 Y = 1,001,685	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-374

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-374
LOCATION COORDINATES	X = 841,453 Y = 1,002,702
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 15 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	17.0 Ft.
15. DATE BORING	STARTED: 05-10-06 COMPLETED: 05-10-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, poorly-graded, trace sandstone up to 1/8, 10YR 7/3 very pale brown (SP)	NR	1		SPT Sampler	5 7 7 6	14
22.0	4.0		SAND, silty, 10YR 4/1 dark gray (SM)	NR	2		SPT Sampler	3 7 4 4	11
20.0	6.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	4 9 10 11	19
18.0	8.0		SAND, silty, 10YR 5/1 gray (SM)	NR	4		SPT Sampler	6 7 9 11	16
16.0	10.0		SAND, clayey, some shell, moist, 5GY 7/1 light greenish gray (SC) ▼	NR	5		SPT Sampler	5 7 9 14	16
14.0	12.0		From El. 16.0 to 14.0 Ft., some shell, moist, 5GY 7/1 light greenish gray	NR	6		SPT Sampler	6 9 12 14	21
12.0	14.0		SAND, poorly-graded with silt, some fine-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	7		SPT Sampler	11 16 23 29	39
			From El. 12.0 to 7.5 Ft., some fine-grained sand-sized shell, 10YR 6/3 pale brown	NR	8		SPT Sampler	16 9	

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Boring Designation CB-374

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,453 Y = 1,002,702	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	7 13	16
							Advanced Boring 7.5		
			From El. 7.5 to 2.5 Ft., some shell, 10YR 5/1 gray	NR	9		SPT Sampler 6.0	18 26 32	58
2.5	23.5						Advanced Boring 2.5		
			SAND, poorly-graded, some shell, 10YR 5/1 gray (SP)	NR	10		SPT Sampler 1.0	24 29 30	59
-2.5	28.5						Advanced Boring -2.5		
			SAND, well-graded, mostly fine to coarse-grained sand-sized shell up to 1/4, 10YR 5/1 gray (SW)	NR	11		SPT Sampler -4.0	6 10 13	23
-7.5	33.5						Advanced Boring -7.5		
			SAND, poorly-graded, trace shell, 10YR 5/1 gray (SP)	NR	12		SPT Sampler -9.0	13 16 17	33

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-374

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,453 Y = 1,002,702	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., trace shell, 10YR 5/1 gray	NR	13		SPT Sampler	8 / 8 / 11	19
							-14.0		
							Advanced Boring		
-17.5	43.5						-17.5		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell up to 1/2, moist, 10YR 5/1 gray (SP-SM)	NR	14		SPT Sampler	4 / 5 / 9	14
							-19.0		
							Advanced Boring		
							-22.5		
			From El. -22.5 to -24.0 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray	NR	15		SPT Sampler	7 / 9 / 15	24
-24.0	50.0						-24.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Boring Designation CB-375

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-375
LOCATION COORDINATES	X = 841,481 Y = 1,003,675
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-11-06 / COMPLETED 05-11-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 4/1 dark gray (SM)	NR	1		SPT Sampler	7 7 6 5	13
			From El. 24.0 to 22.0 Ft., few fine to coarse-grained sand-sized shell, 10YR 6/6 brownish yellow	NR	2		SPT Sampler	3 3 3 4	6
			From El. 22.0 to 20.0 Ft., few medium to coarse-grained sand-sized limestone, 10YR 5/2 grayish brown	NR	3		SPT Sampler	7 7 9 11	16
			From El. 20.0 to 18.0 Ft., percent fines 6 to 8 ft bls = 18.1%, 10YR 7/1 light gray	NR	4		SPT Sampler	4 9 11 13	20
			From El. 18.0 to 16.0 Ft., some fine-grained sand-sized shell, 10YR 7/1 light gray	NR	5		SPT Sampler	10 8 13 17	21
			From El. 16.0 to 14.0 Ft., some fine-grained sand-sized shell, 10YR 7/1 light gray	NR	6		SPT Sampler	4 5 9 10	14
14.0	12.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized shell, percent fines 12 to 14 ft bls = 4.8%, 10YR 6/3 pale brown (SP)	NR	7		SPT Sampler	13 15 17 22	32
			From El. 12.0 to 7.5 Ft., mostly fine to medium-grained sand-sized shell, 10YR 6/3 pale brown	NR	8		SPT Sampler	13 14	

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Boring Designation CB-375

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,481 Y = 1,003,675	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	16 / 15	30
							10.0 Advanced Boring		
			From El. 7.5 to 2.5 Ft., few fine-grained sand-sized shell, 10YR 4/1 dark gray	NR	9		7.5 SPT Sampler	20 / 26 / 28	54
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	10		2.5 SPT Sampler	20 / 22 / 19	41
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	11		-2.5 SPT Sampler	4 / 12 / 14	26
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., trace shell, 10YR 5/1 gray	NR	12		-7.5 SPT Sampler	11 / 15 / 22	37
							-9.0		

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Database/Template Checked

Boring Designation CB-375

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,481 Y = 1,003,675	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	13		SPT Sampler	7 / 6 / 12	18
							-14.0		
							Advanced Boring		
							-17.5		
			From El. -17.5 to -22.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	14		SPT Sampler	2 / 7 / 6	13
							-19.0		
							Advanced Boring		
							-22.5		
			From El. -22.5 to -27.5 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 4/1 dark gray	NR	15		SPT Sampler	6 / 12 / 16	28
							-24.0		
							Advanced Boring		
							-27.5		
			From El. -27.5 to -32.5 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray	NR	16		SPT Sampler	8 / 10 / 10	20
							-29.0		

35 40 45 50 55

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Boring Designation CB-375

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,481 Y = 1,003,675	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-32.5		
			From El. -32.5 to -37.5 Ft., some shell, 10YR 5/1 gray	NR	17		SPT Sampler	9 / 11 / 14	25
							-34.0		
							Advanced Boring		
							-37.5		
			From El. -37.5 to -42.5 Ft., some shell, 10YR 7/1 light gray	NR	18		SPT Sampler	10 / 13 / 13	26
							-39.0		
							Advanced Boring		
							-42.5		
			From El. -42.5 to -47.5 Ft., some shell, 10YR 7/1 light gray	NR	19		SPT Sampler	7 / 12 / 15	27
							-44.0		
							Advanced Boring		
							-47.5		
			From El. -47.5 to -49.0 Ft., trace shell, wet, 10YR 7/1 light gray	NR	20		SPT Sampler	10 / 14 / 14	28
-49.0	75.0						-49.0		

55 60 65 70 75

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Boring Designation CB-375

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,481 Y = 1,003,675	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Boring Designation CB-376

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-376
LOCATION COORDINATES	X = 841,482 Y = 1,004,695
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 15 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-11-06 / COMPLETED 05-11-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 4/1 dark gray (SM)	NR	1		SPT Sampler	1, 2, 4, 3	6
23.5	2.5						24.0		
			SAND, clayey, trace plant debris, percent fines 4 to 6 ft bls = 27.1%, 10YR 5/1 gray (SC)	NR	2		SPT Sampler	3, 2, 2, 3	4
							22.0		
				NR	3		SPT Sampler	2, 2, 4, 7	6
							20.0		
			From El. 19.5 to 17.5 Ft., trace limestone up to 1/8, percent fines 6 to 8 ft bls = 23.8%, 5GY 5/1 greenish gray	NR	4		SPT Sampler	16, 14, 12, 7	26
							18.0		
17.5	8.5								
			SAND, poorly-graded, mostly fine-grained sand-sized shell, 5GY 5/1 greenish gray (SP)	NR	5		SPT Sampler	4, 5, 8, 26	13
							16.0		
			From El. 16.0 to 14.0 Ft., mostly fine-grained sand-sized shell, wet, 10YR 7/1 light gray	NR	6		SPT Sampler	3, 10, 22, 19	32
14.0	12.0						14.0		
			SAND, poorly-graded with silt, mostly fine-grained sand-sized shell, moist, 10YR 7/1 light gray (SP-SM)	NR	7		SPT Sampler	20, 18, 23, 23	41
							12.0		
			From El. 12.0 to 7.5 Ft., mostly fine-grained sand-sized shell, percent fines 14 to 16 ft bls = 5.9%, 10YR 5/1 gray	NR	8		SPT Sampler	10, 25	

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Boring Designation CB-376

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,482 Y = 1,004,695	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	31 / 34	56
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	9		SPT Sampler	17 / 21 / 20	41
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray	NR	11		2.5 SPT Sampler	14 / 12 / 10	22
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., trace fine-grained sand-sized shell, moist, 10YR 5/1 gray	NR	12		-2.5 SPT Sampler	8 / 8 / 10	18
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., trace fine-grained sand-sized shell, wet, 10YR 5/1 gray	NR	13		-7.5 SPT Sampler	8 / 8 / 8	16
							-9.0		

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-376

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,482 Y = 1,004,695	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., trace fine-grained sand-sized shell, wet, 10YR 5/1 gray	NR	14		SPT Sampler	8 / 8 / 7	15
							-14.0		
							Advanced Boring		
-17.5	43.5						-17.5		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell up to 1/2, wet, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler	6 / 7 / 7	14
							-19.0		
							Advanced Boring		
							-22.5		
			From El. -22.5 to -24.0 Ft., some fine to coarse-grained sand-sized shell up to 1/4, moist, 10YR 5/1 gray	NR	16		SPT Sampler	5 / 6 / 4	10
-24.0	50.0						-24.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Boring Designation CB-377

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-377
LOCATION COORDINATES	X = 841,517 Y = 1,005,734
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-11-06 / COMPLETED 05-11-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, trace roots, 10YR 4/1 dark gray (SM)	NR	1		SPT Sampler	5 3 2 3	5
21.0	5.0		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)	NR	2		SPT Sampler	2 4 6 3	10
16.0	10.0		SAND, clayey, percent fine 5 to 6 ft bls = 18.2%, 10YR 4/1 dark gray (SC)	NR	3		SPT Sampler	2 2 3 3	5
				NR	4		SPT Sampler	3 5 5 7	10
			From El. 17.0 to 16.0 Ft., percent fine 9 to 10 ft bls = 23.2%, 10YR 6/6 brownish yellow	NR	5		SPT Sampler	2 1 1 2	2
12.0	14.0		SAND, poorly-graded with silt, some fine-grained sand-sized shell, wet, 10YR 5/1 gray (SP-SM)	NR	6		SPT Sampler	3 4 6 7	10
			From El. 14.0 to 12.0 Ft., some fine-grained sand-sized shell, moist, 10YR 5/1 gray	NR	7		SPT Sampler	8 10 15 18	25
			SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	8		SPT Sampler	9 13	

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☒ Geology/Nomenclature Checked
☐ Database/Template Checked

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Boring Designation CB-377

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,517 Y = 1,005,734	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
10.0	16.0			NR	8		SPT Sampler 10.0	22 / NR	35
7.5	18.5		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)				Advanced Boring 7.5		
			SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	13 / 14 / 19	33
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., few fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	20 / 19 / 22	41
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., few fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	12 / 13 / 14	27
							Advanced Boring -7.5		
			From El. -7.5 to -12.5 Ft., few fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray	NR	12		SPT Sampler -9.0	8 / 9 / 6	15

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-377

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,517 Y = 1,005,734	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring		
			SAND, poorly-graded with silt, few fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SP-SM)	NR	13		SPT Sampler	5 5 6	11
							Advanced Boring		
			From El. -17.5 to -22.5 Ft., few fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray	NR	14		SPT Sampler	4 5 5	10
-22.5	48.5						Advanced Boring		
			SAND, silty, little shell, wet, 10YR 5/1 gray (SM)	NR	15		SPT Sampler	4 8 3	11
-27.5	53.5						Advanced Boring		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	16		SPT Sampler	14 16 19	35

-12.5 -14.0 -17.5 -19.0 -22.5 -24.0 -27.5 -29.0

35 40 45 50 55

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-377

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,517 Y = 1,005,734	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring -32.5		
			SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	17		SPT Sampler -34.0	11 13 15	28
							Advanced Boring -37.5		
			From El. -37.5 to -42.5 Ft., moist, 10YR 5/1 gray	NR	18		SPT Sampler -39.0	12 11 18	29
							Advanced Boring -42.5		
			From El. -42.5 to -47.5 Ft., trace shell, moist, 10YR 5/1 gray	NR	19		SPT Sampler -44.0	12 13 14	27
							Advanced Boring -47.5		
			From El. -47.5 to -49.0 Ft., trace shell, 10YR 5/1 gray	NR	20		SPT Sampler -49.0	9 13 11	24
-49.0	75.0								

55 60 65 70 75

DRAFT
Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-377

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,517 Y = 1,005,734	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-378

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-378
LOCATION COORDINATES	X = 840,726 Y = 998,081
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-11-06 / COMPLETED 05-11-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, trace root, 10YR 5/2 grayish brown (SM)	NR	1		SPT Sampler	5 4 5 5	9
			From El. 24.0 to 22.0 Ft., trace shell, 10YR 5/2 grayish brown	NR	2		SPT Sampler	4 4 4 5	8
22.0	4.0						22.0		
			SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)	NR	3		SPT Sampler	3 3 7 7	10
20.0	6.0						20.0		
			SAND, silty, 10YR 5/1 gray (SM)	NR	4		SPT Sampler	3 3 5 8	8
			From El. 18.0 to 16.0 Ft., 10YR 5/1 gray	NR	5		SPT Sampler	8 8 8 8	16
							16.0		
			From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	6		SPT Sampler	9 6 6 3	12
14.0	12.0						14.0		
			SAND, clayey, few shell, 5GY 5/1 greenish gray (SC)	NR	7		SPT Sampler	3 2 2 2	4
12.0	14.0						12.0		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP-SM)	NR	8		SPT Sampler	8 7	

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-378

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,726 Y = 998,081	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	9 / 8	16
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	9		SPT Sampler	24 / 17 / 8	25
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	10		SPT Sampler	15 / 16 / 14	30
							1.0 Advanced Boring		
-2.5	28.5		SAND, silty, little shell, 10YR 4/1 dark gray (SM)	NR	11		SPT Sampler	8 / 9 / 11	20
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., little shell, 10YR 5/1 gray	NR	12		SPT Sampler	4 / 5 / 3	8
							-9.0		

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-378

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,726 Y = 998,081	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., percent fines 38.5 to 40 ft bls = 11.3%, 10YR 5/1 gray	NR	13		SPT Sampler -14.0	9 10 11	21
							Advanced Boring -17.5		
-17.5	43.5		SAND, clayey, some fine to coarse-grained sand-sized shell, percent fines 43.5 to 45 ft bls = 29.6%, 10YR 5/1 gray (SC)	NR	14		SPT Sampler -19.0	4 3 3	6
							Advanced Boring -22.5		
			From El. -22.5 to -27.5 Ft., trace shell, moist, percent fines 48.5 to 50 ft bls = 39.6%, 10YR 4/1 dark gray	NR	15		SPT Sampler -24.0	1 4 3	7
							Advanced Boring -27.5		
			From El. -27.5 to -32.5 Ft., little shell, wet, 10YR 4/1 dark gray	NR	16		SPT Sampler -29.0	5 3 3	6

35 40 45 50 55

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-378

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,726 Y = 998,081	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring -32.5		
-37.5	63.5		SAND, silty, 10YR 5/1 gray (SM)	NR	17		SPT Sampler -34.0	9 14 26	40
							Advanced Boring -37.5		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP-SM)	NR	18		SPT Sampler -39.0	10 10 12	22
							Advanced Boring -42.5		
			From El. -42.5 to -47.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	19		SPT Sampler -44.0	17 15 14	29
							Advanced Boring -47.5		
-49.0	75.0		From El. -47.5 to -49.0 Ft., 10YR 5/1 gray	NR	20		SPT Sampler -49.0	9 10 8	18

55 60 65 70 75

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-378

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,726 Y = 998,081	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
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85
90
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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-379

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-379
LOCATION COORDINATES	X = 840,794 Y = 998,011
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	20.0 Ft.
15. DATE BORING	STARTED 05-12-06 / COMPLETED 05-12-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 5/2 grayish brown (SM)	NR	1		SPT Sampler	2, 4, 6, 8	10
			From El. 24.0 to 22.0 Ft., 10YR 5/1 gray	NR	2		24.0 SPT Sampler	4, 5, 6, 7	11
			From El. 22.0 to 20.0 Ft., 10YR 4/1 dark gray	NR	3		22.0 SPT Sampler	4, 5, 6, 6	11
			From El. 20.0 to 18.0 Ft., 10YR 4/1 dark gray	NR	4		20.0 SPT Sampler	3, 5, 5, 8	10
			From El. 18.0 to 17.0 Ft., 10YR 5/1 gray	NR	5		18.0 SPT Sampler	5, 9, 11, 13	20
			From El. 17.0 to 16.0 Ft., 10YR 5/1 gray	NR	6		16.0 SPT Sampler	5, 9, 11, 13	20
			From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	7		14.0 SPT Sampler	2, 2, 1, 2	3
			From El. 14.0 to 12.5 Ft., 10YR 5/1 gray	NR	8		12.0 SPT Sampler	2, 2	
12.5	13.5		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM) From El. 12.0 to 7.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown						

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Initial Data Entry Checked
Geology/Moisture Checked
Database/Template Checked

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Boring Designation CB-379

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,794 Y = 998,011	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	3 3	5
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded with silt, mostly fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	9		SPT Sampler 6.0	6 9 10	19
2.5	23.5						Advanced Boring 2.5		
			SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	10		SPT Sampler 1.0	10 10 9	19
-2.5	28.5						Advanced Boring -2.5		
			SAND, poorly-graded with silt, wet, 10YR 5/1 gray (SP-SM)	NR	11		SPT Sampler -4.0	7 10 12	22
-7.5	33.5						Advanced Boring -7.5		
			SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	12		SPT Sampler -9.0	4 2 8	10

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-379

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,794 Y = 998,011	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring		
-17.5	43.5		SAND, silty, few shell, wet, percent fines 38.5 to 40 ft bls = 12.3%, 10YR 5/1 gray (SM)	NR	13		SPT Sampler (-12.5 to -14.0)	14 / 12 / 8	20
							Advanced Boring (-14.0 to -17.5)		
-27.5	53.5		SAND, clayey, few shell, wet, percent fines 43.5 to 45 ft bls = 41.7%, 10YR 5/1 gray (SC)	NR	14		SPT Sampler (-17.5 to -19.0)	3 / 4 / 2	6
							Advanced Boring (-19.0 to -22.5)		
			From El. -22.5 to -27.5 Ft, few shell, percent fines 48.5 to 50 ft bls = 33.9%, 10YR 5/1 gray	NR	15		SPT Sampler (-22.5 to -24.0)	3 / 2 / 2	4
							Advanced Boring (-24.0 to -27.5)		
-29.0			SAND, silty, few shell, 10YR 5/1 gray (SM)	NR	16		SPT Sampler (-27.5 to -29.0)	17 / 24 / 27	51

35 40 45 50 55

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-379

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,794 Y = 998,011	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring -32.5		
			SAND, poorly-graded, few shell, wet, 10YR 5/1 gray (SP)	NR	17		SPT Sampler -34.0	17 24 23	47
							Advanced Boring -37.5		
			From El. -37.5 to -42.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	18		SPT Sampler -39.0	13 12 23	35
							Advanced Boring -42.5		
			From El. -42.5 to -47.5 Ft., trace sandstone up to 1/4, 10YR 5/1 gray	NR	19		SPT Sampler -44.0	15 19 17	36
							Advanced Boring -47.5		
			From El. -47.5 to -49.0 Ft., few shell, 10YR 5/1 gray	NR	20		SPT Sampler -49.0	17 22 24	46
-49.0	75.0								

55 60 65 70 75

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-379

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,794 Y = 998,011	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-380

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-380
LOCATION COORDINATES	X = 840,888 Y = 998,125
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-12-06 / COMPLETED 05-12-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 7/1 light gray (SM)	NR	1		SPT Sampler	5 6 9 10	15
			From El. 24.0 to 22.0 Ft., 10YR 5/1 gray				24.0		
22.0	4.0			NR	2		SPT Sampler	9 4 8 10	12
			SAND, clayey, percent fines 4 to 6 ft bls = 24.0%, 10YR 7/1 light gray (SC)				22.0		
20.0	6.0			NR	3		SPT Sampler	4 5 5 3	10
			SAND, silty, 10YR 7/1 light gray (SM)	NR	4		20.0 SPT Sampler	3 7 7 7	14
18.0	8.0								
			SAND, clayey, 10YR 4/1 dark gray (SC)	NR	5		18.0 SPT Sampler	3 7 8 7	15
16.0	10.0								
			SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)	NR	6		16.0 SPT Sampler	3 3 6 4	9
14.0	12.0								
			SAND, silty, 10YR 5/1 gray (SM)	NR	7		14.0 SPT Sampler	2 1 1 1	2
12.0	14.0						12.0		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 5/2 grayish brown (SP-SM)	NR	8		SPT Sampler	3 14	

0 5 10 15

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☒ Initial Data Entry Checked
☒ Geology/Hydrostructure Checked
☐ Database/Template Checked

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Boring Designation CB-380

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,888 Y = 998,125	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	24 / 32	38
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, 10YR 4/1 dark gray (SP)	NR	9		SPT Sampler	6 / 9 / 12	21
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., mostly fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	10		SPT Sampler	12 / 8 / 8	16
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	11		SPT Sampler	8 / 10 / 11	21
							-4.0 Advanced Boring		
-7.5	33.5		SAND, silty, few shell, moist, 10YR 5/1 gray (SM)	NR	12		SPT Sampler	5 / 5 / 7	12
							-9.0		

15 20 25 30 35

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-380

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,888 Y = 998,125	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring		
			SAND, clayey, few shell, percent fines 38.5 to 40 ft bls = 28.5%, 10YR 5/1 gray (SC)	NR	13		SPT Sampler	7 8 13	21
							Advanced Boring		
			From El. -17.5 to -22.5 Ft., few shell, percent fines 43.5 to 45 ft bls = 48.1%, 10YR 5/1 gray	NR	14		SPT Sampler	6 3 2	5
-22.5	48.5						Advanced Boring		
			SAND, poorly-graded with silt, few shell, percent fines 48.5 to 50 ft bls = 8.9%, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler	2 1 1	2
-27.5	53.5						Advanced Boring		
			SAND, silty, mostly fine to coarse-grained sand-sized shell up to 1/4, wet, 10YR 5/1 gray (SM)	NR	16		SPT Sampler	4 3 5	8

-12.5 -14.0 -17.5 -19.0 -22.5 -24.0 -27.5 -29.0

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Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

Boring Designation CB-380

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,888 Y = 998,125	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring -32.5		
			SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	17		SPT Sampler -34.0	12 27 33	60
							Advanced Boring -37.5		
			From El. -37.5 to -42.5 Ft., few sandstone up to 3/8, 10YR 5/1 gray	NR	18		SPT Sampler -39.0	25 35 40	75
							Advanced Boring -42.5		
			From El. -42.5 to -47.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	19		SPT Sampler -44.0	12 8 7	15
							Advanced Boring -47.5		
			From El. -47.5 to -49.0 Ft., 10YR 5/1 gray	NR	20		SPT Sampler -49.0	10 10 8	18
-49.0	75.0								

55 60 65 70 75

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-380

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,888 Y = 998,125	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-381

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-381
LOCATION COORDINATES	X = 840,836 Y = 998,204
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-15-06 / COMPLETED 05-15-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)	NR	1		SPT Sampler	5 6 7 10	13
22.0	4.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	2		SPT Sampler	4 4 6 7	10
20.0	6.0		SAND, silty, percent fines = 15.1%, 10YR 5/1 gray (SM)	NR	3		SPT Sampler	5 7 5 5	12
18.0	8.0		SAND, clayey, percent fines = 40.2%, 10YR 5/1 gray (SC)	NR	4		SPT Sampler	2 2 2 3	4
16.0	10.0		SAND, silty, 10YR 4/1 dark gray (SM)	NR	5		SPT Sampler	7 9 10 9	19
14.0	12.0		From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	6		SPT Sampler	5 7 7 9	14
12.0			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, wet, 10YR 6/3 pale brown (SP-SM)	NR	7		SPT Sampler	2 3 5 9	8
			From El. 12.0 to 7.5 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 6/3 pale brown	NR	8		SPT Sampler	4 4	

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☒ Geology/Nomenclature Checked
☐ Database/Template Checked

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Boring Designation CB-381

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,836 Y = 998,204	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	5 19	9
							Advanced Boring 7.5		
7.5	18.5		SAND, silty, some fine to coarse-grained sand-sized shell, 10YR 4/1 dark gray (SM)	NR	9		SPT Sampler 6.0	12 19 23	42
							Advanced Boring 2.5		
2.5	23.5		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 4/1 dark gray (SP-SM)	NR	10		SPT Sampler 1.0	20 25 23	48
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 4/1 dark gray	NR	11		SPT Sampler -4.0	10 10 17	27
							Advanced Boring -7.5		
-7.5	33.5		SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	12		SPT Sampler -9.0	10 11 9	20

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-381

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,836 Y = 998,204	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	13		SPT Sampler	7 8 7	15
							-14.0		
							Advanced Boring		
-17.5	43.5						-17.5		
			SAND, clayey, trace shell, wet, percent fines = 32.6%, 5GY 5/1 greenish gray (SC)	NR	14		SPT Sampler	4 2 3	5
							-19.0		
							Advanced Boring		
							-22.5		
			From El. -22.5 to -27.5 Ft., trace shell, wet, percent fines = 41.4%, 5GY 5/1 greenish gray	NR	15		SPT Sampler	5 3 5	8
							-24.0		
							Advanced Boring		
-27.5	53.5						-27.5		
			SAND, silty, wet, 10YR 4/1 dark gray (SM)	NR	16		SPT Sampler	5 3 5	8
							-29.0		

35 40 45 50 55

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-381

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,836 Y = 998,204	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-32.5		
			From El. -32.5 to -37.5 Ft., wet, 10YR 4/1 dark gray	NR	17		SPT Sampler	7 / 9 / 11	20
							-34.0		
							Advanced Boring		
-37.5	63.5						-37.5		
			SAND, poorly-graded with silt, little shell, 10YR 5/1 gray (SP-SM)	NR	18		SPT Sampler	27 / 24 / 24	48
							-39.0		
							Advanced Boring		
							-42.5		
			From El. -42.5 to -47.5 Ft., little shell, wet, 10YR 5/1 gray	NR	19		SPT Sampler	15 / 17 / 20	37
							-44.0		
							Advanced Boring		
							-47.5		
			From El. -47.5 to -49.0 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	20		SPT Sampler	15 / 11 / 10	21
-49.0	75.0						-49.0		

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-381

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,836 Y = 998,204	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-382

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-382
LOCATION COORDINATES	X = 840,591 Y = 998,312
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 15 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-15-06 / COMPLETED 05-15-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, few medium to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SM)	NR	1		SPT Sampler	5 6 9 8	15
			From El. 24.0 to 22.0 Ft., 10YR 6/2 light brownish gray	NR	2		24.0 SPT Sampler	3 3 4 2	7
			From El. 22.0 to 20.0 Ft., 10YR 5/1 gray	NR	3		22.0 SPT Sampler	1 2 2 6	4
20.0	6.0						20.0		
			SAND, clayey, trace shell, 10YR 5/1 gray (SC)	NR	4		SPT Sampler	6 6 8 11	14
			From El. 18.0 to 16.0 Ft., 5GY 5/1 greenish gray	NR	5		18.0 SPT Sampler	7 10 10 10	20
16.0	10.0						16.0		
			SAND, silty, percent fines = 13.2, 10YR 5/1 gray (SM)	NR	6		SPT Sampler	2 2 3 4	5
14.0	12.0						14.0		
			SAND, silty, mostly fine to coarse-grained sand-sized shell, few sandstone up to 1/2, 10YR 7/1 light gray (SM)	NR	7		SPT Sampler	3 4 5 5	9
			From El. 12.0 to 7.5 Ft., mostly fine to coarse-grained sand-sized shell, few sandstone up to 1/4, 10YR 7/1 light gray	NR	8		12.0 SPT Sampler	7 8	

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☐ Database/Template Checked

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Boring Designation CB-382

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,591 Y = 998,312	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	10 / 11	18
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	8 / 7 / 10	17
							Advanced Boring 2.5		
2.5	23.5		SAND, well-graded, mostly fine to coarse-grained sand-sized shell up to 1/8, moist, 10YR 5/1 gray (SW)	NR	10		SPT Sampler 1.0	9 / 15 / 11	26
							Advanced Boring -2.5		
-2.5	28.5		SAND, poorly-graded with silt, trace shell, 10YR 4/1 dark gray (SP-SM)	NR	11		SPT Sampler -4.0	9 / 10 / 13	23
							Advanced Boring -7.5		
-7.5	33.5		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SP)	NR	12		SPT Sampler -9.0	1 / 2 / 4	6

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-382

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,591 Y = 998,312	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring		
			SAND, silty, trace shell, 10YR 4/1 dark gray (SM)	NR	13		SPT Sampler	10 / 8 / 7	15
-17.5	43.5						Advanced Boring		
			SAND, clayey, trace shell, wet, percent fines = 38.5%, 10YR 5/1 gray (SC)	NR	14		SPT Sampler	2 / 3 / 3	6
-22.5	48.5						Advanced Boring		
			SAND, silty, trace shell, wet, percent fines = 17.7%, 10YR 5/1 gray (SM)	NR	15		SPT Sampler	4 / 5 / 6	11

-12.5 -14.0 -17.5 -19.0 -22.5

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-382

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 4 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,591 Y = 998,312	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	75		SPT Sampler		
-49.0	75.0						-49.0		

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60
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70
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Geology/Nomenclature Checked
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Boring Designation CB-382

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,591 Y = 998,312	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-383

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-383
LOCATION COORDINATES	X = 840,584 Y = 978,341
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	12.0 Ft.
15. DATE BORING	STARTED 05-22-06 / COMPLETED 05-22-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, poorly-graded, 10YR 6/3 pale brown (SP)	NR	1		SPT Sampler	5 7 7 8	14
			From El. 24.0 to 22.0 Ft., 10YR 6/3 pale brown	NR	2		SPT Sampler	7 7 8 4	15
			From El. 22.0 to 20.0 Ft., 10YR 5/3 brown	NR	3		SPT Sampler	2 2 2 3	4
20.0	6.0						20.0		
			SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)	NR	4		SPT Sampler	3 3 3 3	6
18.0	8.0						18.0		
			SAND, silty, 10YR 6/2 light brownish gray (SM)	NR	5		SPT Sampler	3 5 5 7	10
			From El. 16.0 to 14.0 Ft., some fine to coarse-grained sand-sized shell, 10YR 7/3 very pale brown	NR	6		SPT Sampler	6 7 5 8	12
14.0	12.0						14.0		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	7		SPT Sampler	4 5 6 8	11
12.0	14.0						12.0		
			SAND, silty, moist, 10YR 5/1 gray (SM)	NR	8		SPT Sampler	6 6	

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☒ Geology/Nomenclature Checked
☐ Database/Template Checked

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Boring Designation CB-383

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,584 Y = 978,341	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	7 / 7	13
							10.0 Advanced Boring		
			From El. 7.5 to 2.5 Ft., moist, percent fines = 11.1%, 10YR 5/1 gray	NR	9		SPT Sampler	4 / 3 / 3	6
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., moist, 10YR 5/1 gray	NR	10		SPT Sampler	3 / 3 / 7	10
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., moist, 10YR 5/1 gray	NR	11		SPT Sampler	4 / 9 / 7	16
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., moist, 10YR 5/1 gray	NR	12		SPT Sampler	3 / 2 / 2	4
							-9.0		

15 20 25 30 35

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-383

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,584 Y = 978,341	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
-12.5	38.5						-12.5		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell up to 1/2, wet, 10YR 5/1 gray (SP-SM)	NR	13		SPT Sampler	6 5 5	10
							-14.0		
							Advanced Boring		
							-17.5		
			From El. -17.5 to -22.5 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray	NR	14		SPT Sampler	6 4 4	8
							-19.0		
							Advanced Boring		
-22.5	48.5						-22.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP)	NR	15		SPT Sampler	12 18 15	33
							-24.0		
							Advanced Boring		
							-27.5		
			From El. -27.5 to -32.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	16		SPT Sampler	10 13 14	27
							-29.0		

35 40 45 50 55

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-383

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,584 Y = 978,341	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring		
-34.0			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP-SM)	NR	17		SPT Sampler	16 13 11	24
-37.5	63.5						Advanced Boring		
-39.0			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP)	NR	18		SPT Sampler	11 10 18	28
-42.5	68.5						Advanced Boring		
-44.0			SAND, silty, moist, 10YR 5/1 gray (SM)	NR	19		SPT Sampler	10 22 23	45
-47.5	73.5						Advanced Boring		
-49.0	75.0		SAND, poorly-graded, few shell, moist, 10YR 5/1 gray (SP)	NR	20		SPT Sampler	20 17 14	31

55 60 65 70 75

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Initial/Data Entry Checked

Boring Designation CB-383

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,584 Y = 978,341	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Boring Designation CB-384

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 6 SHEETS

1. PROJECT: C-44 Reservoir/STA Project	9. SIZE AND TYPE OF BIT
	10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.) — HORIZONTAL: NAD 83 — VERTICAL: NAVD88
2. BORING DESIGNATION: CB-384 — LOCATION COORDINATES: X = 840,771 Y = 978,486	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-55 (land-based) — ☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams — CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES — DISTURBED: 27 — UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG. FROM VERTICAL: — BEARING:	14. ELEVATION GROUND WATER: 12.0 Ft.
	15. DATE BORING — STARTED: 05-22-06 — COMPLETED: 05-22-06
6. THICKNESS OF OVERBURDEN: N/A	16. ELEVATION TOP OF BORING: 26.0 Ft.
7. DEPTH DRILLED INTO ROCK: N/A	17. TOTAL RECOVERY FOR BORING: Not Recorded
8. TOTAL DEPTH OF BORING: 110.0 Ft.	18. SIGNATURE AND TITLE OF INSPECTOR: ,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, poorly-graded, 10YR 5/2 grayish brown (SP)	NR	1		SPT Sampler	4, 4, 6, 8	10
22.0	4.0		CLAY, lean, percent fines = 81.6%, 10YR 4/2 dark grayish brown (CL)	NR	2		SPT Sampler	5, 4, 2, 2	6
20.0	6.0		SAND, poorly-graded, 10YR 7/1 light gray (SP)	NR	3		SPT Sampler	5, 4, 3, 3	7
			SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)	NR	4		SPT Sampler	5, 4, 5, 7	9
16.0	10.0		From El. 18.0 to 16.0 Ft., trace clay, 10YR 6/2 light brownish gray	NR	5		SPT Sampler	4, 6, 6, 7	12
14.0	12.0		SAND, silty, 10YR 5/1 gray (SM)	NR	6		SPT Sampler	7, 8, 11, 11	19
12.0	14.0		CLAY, lean, some sandstone up to 1, 10YR 4/2 dark grayish brown (CL)	NR	7		SPT Sampler	1, 1, 10, 1	11
			SAND, poorly-graded, trace clay, 10YR 5/1 gray (SP)	NR	8		SPT Sampler	2, 4	

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Boring Designation CB-384

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 6 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,771 Y = 978,486	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	8 / 6	12
							10.0 Advanced Boring		
			From El. 7.5 to 2.5 Ft., 10YR 5/1 gray	NR	9		7.5 SPT Sampler	9 / 7 / 5	12
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., 10YR 5/1 gray	NR	10		2.5 SPT Sampler	7 / 7 / 7	14
							1.0 Advanced Boring		
-2.5	28.5		SAND, poorly-graded with silt, moist, 10YR 5/1 gray (SP-SM)	NR	11		-2.5 SPT Sampler	3 / 1 / 2	3
							-4.0 Advanced Boring		
-7.5	33.5		SAND, silty, moist, 5GY 4/1 dark greenish gray (SM)	NR	12		-7.5 SPT Sampler	1 / 1 / 2	3
							-9.0		

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-384

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 3 OF 6 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,771 Y = 978,486	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring -12.5		
			SAND, poorly-graded, little shell, moist, 10YR 5/1 gray (SP)	NR	13		SPT Sampler -14.0	5 5 4	9
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray	NR	14		SPT Sampler -19.0	7 7 7	14
							Advanced Boring -22.5		
			From El. -22.5 to -27.5 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray	NR	15		SPT Sampler -24.0	10 6 13	19
							Advanced Boring -27.5		
			From El. -27.5 to -32.5 Ft., 10YR 5/1 gray	NR	16		SPT Sampler -29.0	23 30 26	56

35 40 45 50 55

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Boring Designation CB-384

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 6 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,771 Y = 978,486	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-32.5		
			From El. -32.5 to -37.5 Ft., 10YR 5/1 gray	NR	17		SPT Sampler	20 / 28 / 21	49
							-34.0		
							Advanced Boring		
							-37.5		
			From El. -37.5 to -42.5 Ft., trace shell, 10YR 5/1 gray	NR	18		SPT Sampler	22 / 27 / 25	52
							-39.0		
							Advanced Boring		
							-42.5		
			From El. -42.5 to -47.5 Ft., 10YR 5/1 gray	NR	19		SPT Sampler	19 / 13 / 25	38
							-44.0		
							Advanced Boring		
							-47.5		
			From El. -47.5 to -52.5 Ft., few shell, 10YR 5/1 gray	NR	20		SPT Sampler	16 / 9 / 8	17
							-49.0		

55 60 65 70 75

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Database/Template Checked

Boring Designation CB-384

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 5 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,771 Y = 978,486	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-52.5	78.5						Advanced Boring -52.5		
-57.5	83.5		SAND, silty, 10YR 5/1 gray (SM)	NR	21		SPT Sampler -54.0	6 7 9	16
							Advanced Boring -57.5		
-62.5	88.5		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)	NR	22		SPT Sampler -59.0	7 7 11	18
							Advanced Boring -62.5		
			SANDSTONE, moderately hard, 10YR 5/1 gray	NR	23		SPT Sampler -64.0	8 10 7	17
							Advanced Boring -67.5		
			From El. -67.5 to -72.5 Ft., moderately hard, 10YR 5/1 gray	NR	24		SPT Sampler -69.0	4 6 7	13

75 80 85 90 95

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Boring Designation CB-384

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 6 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,771 Y = 978,486	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-72.5	98.5						Advanced Boring		
			SAND, clayey, moist, 10YR 5/1 gray (SC)	NR	25		SPT Sampler -74.0	3 2 3	5
-77.5	103.5						Advanced Boring		
			SAND, silty, some shell, moist, 10YR 5/1 gray (SM)	NR	26		SPT Sampler -79.0	3 4 4	8
							Advanced Boring -82.5		
-84.0	110.0		From El. -82.5 to -84.0 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray	NR	27		SPT Sampler -84.0	6 5 5	10

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

95 100 105 110 115

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Boring Designation CB-385

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-385
LOCATION COORDINATES	X = 840,733 Y = 986,033
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 15 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED: 05-15-06 COMPLETED: 05-15-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 4/2 dark grayish brown (SM)	NR	1		SPT Sampler	6 6 5 6	11
			From El. 24.0 to 22.0 Ft., 10YR 4/1 dark gray	NR	2		24.0 SPT Sampler	3 5 5 7	10
			From El. 22.0 to 20.0 Ft., 10YR 3/1 very dark gray	NR	3		22.0 SPT Sampler	4 4 7 10	11
			From El. 20.0 to 18.0 Ft., 10YR 5/2 grayish brown	NR	4		20.0 SPT Sampler	7 12 13 12	25
18.0	8.0						18.0		
			SAND, clayey, percent fines = 19.8%, 10YR 5/1 gray (SC)	NR	5		SPT Sampler	7 12 13 12	25
16.0	10.0						16.0		
			SAND, silty, 10YR 5/1 gray (SM)	NR	6		SPT Sampler	6 9 10 12	19
			From El. 14.0 to 12.0 Ft., 10YR 5/2 grayish brown	NR	7		14.0 SPT Sampler	3 5 5 7	10
			From El. 12.0 to 7.5 Ft., 10YR 5/2 grayish brown	NR	8		12.0 SPT Sampler	4 5	

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Initial Data Entry Checked

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Boring Designation CB-385

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County		SHEET 2 OF 3 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83	VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,733 Y = 986,033	ELEVATION TOP OF BORING: 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	5 / 4	10
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded with silt, some sandstone up to 1/2, 10YR 5/1 gray (SP-SM)	NR	9		7.5 SPT Sampler	4 / 5 / 4	9
							6.0 Advanced Boring		
2.5	23.5		SAND, poorly-graded, some sandstone up to 1/4, wet, 10YR 5/1 gray (SP)	NR	10		2.5 SPT Sampler	6 / 6 / 11	17
							1.0 Advanced Boring		
-2.5	28.5		SAND, poorly-graded with silt, wet, 10YR 5/1 gray (SP-SM)	NR	11		-2.5 SPT Sampler	7 / 6 / 5	11
							-4.0 Advanced Boring		
-7.5	33.5		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	12		-7.5 SPT Sampler	7 / 7 / 6	13
							-9.0		

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Database/Template Checked

Boring Designation CB-385

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,733 Y = 986,033	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	13		SPT Sampler	6 6 10	16
							Advanced Boring		
			From El. -17.5 to -22.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	14		SPT Sampler	7 9 7	16
-22.5	48.5						Advanced Boring		
-24.0	50.0		SAND, silty, trace shell, 10YR 5/1 gray (SM)	NR	15		SPT Sampler	7 12 14	26

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Boring Designation CB-386

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-386
LOCATION COORDINATES	X = 840,757 Y = 984,189
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 15 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-15-06 / COMPLETED 05-15-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 3/1 very dark gray (SM)	NR	1		SPT Sampler	7, 10, 8, 12	18
			From El. 24.0 to 22.0 Ft., 10YR 3/1 very dark gray				24.0		
				NR	2		SPT Sampler	11, 11, 6, 6	17
22.0	4.0						22.0		
			SAND, clayey, percent fines = 22.3%, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	3, 2, 4, 9	6
20.0	6.0						20.0		
			SAND, poorly-graded with silt, wet, 10YR 5/2 grayish brown (SP-SM)	NR	4		SPT Sampler	5, 8, 4, 9	12
18.0	8.0						18.0		
			SAND, silty, 10YR 5/1 gray (SM)	NR	5		SPT Sampler	1, 2, 10, 8	12
16.0	10.0						16.0		
			SAND, poorly-graded with silt, moist, 10YR 4/1 dark gray (SP-SM)	NR	6		SPT Sampler	4, 6, 6, 5	12
			From El. 14.0 to 12.0 Ft., wet, 10YR 7/1 light gray				14.0		
				NR	7		SPT Sampler	3, 3, 2, 1	5
12.0	14.0						12.0		
			SAND, poorly-graded, wet, 10YR 5/1 gray (SP)	NR	8		SPT Sampler	3, 2	

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☐ Database/Template Checked

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Boring Designation CB-386

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,757 Y = 984,189	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler (10.0)	2, 3	4
							Advanced Boring (7.5)		
			From El. 7.5 to 2.5 Ft., moist, 10YR 5/1 gray	NR	9		SPT Sampler (6.0)	1, 2, 2	4
							Advanced Boring (2.5)		
			From El. 2.5 to -2.5 Ft., wet, 10YR 5/1 gray	NR	10		SPT Sampler (1.0)	2, 3, 4	7
							Advanced Boring (-2.5)		
-2.5	28.5		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SP-SM)	NR	11		SPT Sampler (-4.0)	3, 4, 5	9
							Advanced Boring (-7.5)		
-7.5	33.5		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, trace clay, 10YR 4/1 dark gray (SP)	NR	12		SPT Sampler (-9.0)	4, 4, 3	7

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-386

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,757 Y = 984,189	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring		
-17.5	43.5		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SP-SM)	NR	13		SPT Sampler (-12.5 to -14.0)	4, 6, 8	14
							Advanced Boring (-14.0 to -17.5)		
-24.0	50.0		SAND, poorly-graded, trace shell, 10YR 5/1 gray (SP)	NR	14		SPT Sampler (-17.5 to -19.0)	11, 15, 20	35
							Advanced Boring (-19.0 to -22.5)		
			From El. -22.5 to -24.0 Ft. 10YR 5/1 gray	NR	15		SPT Sampler (-22.5 to -24.0)	10, 13, 12	25

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Geology/Nomenclature Checked
Initial/Data Entry Checked

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Boring Designation CB-387

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 3 SHEETS
	South Atlantic	Martin County	

1. PROJECT: C-44 Reservoir/STA Project		9. SIZE AND TYPE OF BIT	
		10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
2. BORING DESIGNATION: CB-387	LOCATION COORDINATES: X = 840,693 Y = 982,369	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-55 (land-based)	☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams	CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES	DISTURBED: 15 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL / BEARING	14. ELEVATION GROUND WATER: 18.0 Ft.	
		15. DATE BORING	STARTED: 05-16-06 / COMPLETED: 05-16-06
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: 26.0 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: Not Recorded	
8. TOTAL DEPTH OF BORING: 50.0 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: ,	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 5/4 yellowish brown (SM)	NR	1		SPT Sampler	14, 13, 10, 12	23
			From El. 24.0 to 22.0 Ft., trace shell, 10YR 4/3 brown	NR	2		SPT Sampler	5, 7, 9, 14	16
22.0	4.0						22.0		
			SAND, clayey, trace plant debris, 10YR 5/2 grayish brown (SC)	NR	3		SPT Sampler	3, 2, 2, 3	4
20.0	6.0						20.0		
			SAND, silty, trace clay, 10YR 4/3 brown (SM)	NR	4		SPT Sampler	2, 2, 3, 6	5
18.0	8.0						18.0		
			SAND, poorly-graded with silt, trace clay, 10YR 5/2 grayish brown (SP-SM)	NR	5		SPT Sampler	4, 7, 9, 9	16
			From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	6		SPT Sampler	5, 5, 7, 8	12
14.0	12.0						14.0		
			SAND, silty, 10YR 7/1 light gray (SM)	NR	7		SPT Sampler	2, 3, 6, 8	9
			From El. 12.0 to 7.5 Ft., 10YR 5/1 gray	NR	8		SPT Sampler	6, 9	
							12.0		

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Boring Designation CB-387

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,693 Y = 982,369	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	9 / 10	18
7.5	18.5						Advanced Boring 7.5		
			SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)	NR	9		SPT Sampler 6.0	5 / 8 / 8	16
2.5	23.5						Advanced Boring 2.5		
			SAND, silty, 10YR 4/1 dark gray (SM)	NR	10		SPT Sampler 1.0	5 / 7 / 8	15
-2.5	28.5						Advanced Boring -2.5		
			SAND, poorly-graded with silt, wet, 10YR 4/1 dark gray (SP-SM)	NR	11		SPT Sampler -4.0	5 / 5 / 8	13
-7.5	33.5						Advanced Boring -7.5		
			SAND, silty, little shell, 10YR 5/1 gray (SM)	NR	12		SPT Sampler -9.0	5 / 7 / 8	15

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Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

Boring Designation CB-387

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,693 Y = 982,369	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., few shell, 10YR 5/1 gray	NR	13		SPT Sampler -14.0	2 2 3	5
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., few shell, 10YR 5/1 gray	NR	14		SPT Sampler -19.0	5 4 3	7
-22.5	48.5						Advanced Boring -22.5		
-24.0	50.0		SAND, poorly-graded with silt, few shell, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler -24.0	6 6 8	14

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Boring Designation CB-388

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-388
LOCATION COORDINATES	X = 840,761 Y = 980,529
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 15 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	19.0 Ft.
15. DATE BORING	STARTED 05-16-06 / COMPLETED 05-16-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 3/1 very dark gray (SM)	NR	1		SPT Sampler	4 3 7 4	10
			From El. 24.0 to 22.0 Ft., 10YR 3/1 very dark gray	NR	2		SPT Sampler	3 6 8 9	14
22.0	4.0						22.0		
			SAND, clayey, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	4 4 5 5	9
20.0	6.0						20.0		
			SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)	NR	4		SPT Sampler	2 2 4 5	6
18.0	8.0						18.0		
			SAND, silty, 10YR 5/1 gray (SM)	NR	5		SPT Sampler	6 5 5 6	10
16.0	10.0						16.0		
			SAND, poorly-graded with silt, moist, 10YR 4/1 dark gray (SP-SM)	NR	6		SPT Sampler	3 3 5 4	8
			From El. 14.0 to 12.0 Ft., wet, 10YR 7/1 light gray	NR	7		SPT Sampler	2 2 1 1	3
12.0	14.0						12.0		
			SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	8		SPT Sampler	1 1	

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Boring Designation CB-388

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,761 Y = 980,529	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	1 / 1	2
							10.0 Advanced Boring		
			From El. 7.5 to 2.5 Ft., few shell, 10YR 5/1 gray	NR	9		7.5 SPT Sampler	2 / 1 / 1	2
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., wet, 10YR 5/1 gray	NR	10		2.5 SPT Sampler	1 / 1 / 2	3
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., 10YR 5/1 gray	NR	11		-2.5 SPT Sampler	2 / 2 / 2	4
							-4.0 Advanced Boring		
-7.5	33.5						-7.5		
			SAND, poorly-graded with silt, wet, 10YR 4/1 dark gray (SP-SM)	NR	12		SPT Sampler	9 / 5 / 6	11
							-9.0		

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-388

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 3 OF 3 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,761 Y = 980,529	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-12.5	38.5						Advanced Boring -12.5		
-17.5	43.5		SAND, silty, trace shell, wet, 10YR 5/1 gray (SM)	NR	13		SPT Sampler -14.0	5 5 2	7
							Advanced Boring -17.5		
-24.0	50.0		SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	14		SPT Sampler -19.0	7 8 10	18
							Advanced Boring -22.5		
			From El. -22.5 to -24.0 Ft., 10YR 5/1 gray	NR	15		SPT Sampler -24.0	4 3 5	8

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Boring Designation CB-389

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-389
LOCATION COORDINATES	X = 844,032 Y = 1,007,180
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	18.0 Ft.
15. DATE BORING	STARTED 05-17-06 / COMPLETED 05-17-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, clayey, hard, 10YR 4/2 dark grayish brown (SC)	NR	1		SPT Sampler	4 3 3 3	6
24.0	2.0						24.0		
			SAND, silty, 10YR 5/2 grayish brown (SM)	NR	2		SPT Sampler	3 3 5 6	8
			From El. 22.0 to 20.0 Ft., 10YR 5/1 gray	NR	3		SPT Sampler	5 6 6 4	12
							20.0		
			From El. 20.0 to 18.0 Ft., 10YR 5/1 gray	NR	4		SPT Sampler	2 2 3 5	5
18.0	8.0						18.0		
			SAND, poorly-graded, moist, 10YR 5/3 brown (SP)	NR	5		SPT Sampler	5 7 7 6	14
			From El. 16.0 to 14.0 Ft., moist, 10YR 5/1 gray	NR	6		SPT Sampler	4 5 5 6	10
							14.0		
			From El. 14.0 to 12.0 Ft., little fine-grained sand-sized shell, wet, 10YR 5/1 gray	NR	7		SPT Sampler	2 2 5 6	7
							12.0		
			From El. 12.0 to 7.5 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray	NR	8		SPT Sampler	8 9	

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Boring Designation CB-389

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 844,032 Y = 1,007,180	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	13 16	22
7.5	18.5						Advanced Boring 7.5		
			SAND, well-graded, mostly fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SW)	NR	9		SPT Sampler 6.0	18 27 33	60
2.5	23.5						Advanced Boring 2.5		
			SAND, poorly-graded, trace shell, moist, 10YR 5/1 gray (SP)	NR	10		SPT Sampler 1.0	12 17 16	33
							Advanced Boring -2.5		
-4.0	30.0		From El. -2.5 to -4.0 Ft., few shell, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	16 19 20	39

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-390

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-390
LOCATION COORDINATES	X = 841,420 Y = 1,007,673
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	16.0 Ft.
15. DATE BORING	STARTED 05-17-06 / COMPLETED 05-17-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, trace root, 10YR 5/2 grayish brown (SM)	NR	1		SPT Sampler	3 3 5 4	8
22.0	4.0		SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	2		SPT Sampler	5 7 4 5	11
20.0	6.0		SAND, silty, trace root, 10YR 3/1 very dark gray (SM)	NR	3		SPT Sampler	4 2 4 6	6
18.0			SAND, clayey, percent fines = 23.9%, 10YR 5/1 gray (SC)	NR	4		SPT Sampler	6 9 5 8	14
16.0			From El. 18.0 to 16.0 Ft., 10YR 5/1 gray	NR	5		SPT Sampler	7 12 11 10	23
14.0	12.0		From El. 16.0 to 14.0 Ft., 5BG 6/1 greenish gray	NR	6		SPT Sampler	7 9 13 16	22
12.0	14.0		SAND, silty, mostly fine to coarse-grained sand-sized shell, wet, 10YR 8/1 white (SM)	NR	7		SPT Sampler	5 9 14 15	23
			SAND, poorly-graded with silt, mostly fine-grained sand-sized shell, 10YR 8/1 white (SP-SM)	NR	8		SPT Sampler	10 13	

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Boring Designation CB-390

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,420 Y = 1,007,673	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	11 / 10	24
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	17 / 19 / 24	43
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	17 / 21 / 24	45
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	13 / 19 / 20	39
							Advanced Boring -7.5		
			From El. -7.5 to -12.5 Ft., trace shell, moist, 10YR 5/1 gray	NR	12		SPT Sampler -9.0	13 / 18 / 19	37

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-390

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,420 Y = 1,007,673	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., few shell, 10YR 5/1 gray	NR	132		SPT Sampler -14.0	12 13 18	31
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., little shell, wet, 10YR 5/1 gray	NR	14		SPT Sampler -19.0	10 13 11	24
-22.5	48.5						Advanced Boring -22.5		
			SAND, poorly-graded with silt, wet, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler -24.0	7 7 6	13
-27.5	53.5						Advanced Boring -27.5		
			CLAY, lean, soft, 5G 4/1 dark greenish gray (CL)	NR	16		SPT Sampler -29.0	4 2 2	4

35 40 45 50 55

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-390

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,420 Y = 1,007,673	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	17		SPT Sampler -34.0	7 13 11	24
							Advanced Boring -37.5		
			From El. -37.5 to -42.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	18		SPT Sampler -39.0	9 11 14	25
-42.5	68.5						Advanced Boring -42.5		
			SAND, silty, little shell, moist, 10YR 5/1 gray (SM)	NR	19		SPT Sampler -44.0	7 6 6	12
-47.5	73.5						Advanced Boring -47.5		
-49.0	75.0		SAND, clayey, little shell, moist, 10YR 5/1 gray (SC)	NR	20		SPT Sampler -49.0	4 8 10	18

55 60 65 70 75

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-390

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,420 Y = 1,007,673	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Boring Designation CB-391

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 3 SHEETS
	South Atlantic	Martin County	

1. PROJECT: C-44 Reservoir/STA Project		9. SIZE AND TYPE OF BIT	
		10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
2. BORING DESIGNATION: CB-391	LOCATION COORDINATES: X = 841,444 Y = 1,008,631	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-45 (land-based)	☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams	CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES	DISTURBED: 15 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL:	BEARING:	14. ELEVATION GROUND WATER: 17.5 Ft.
		15. DATE BORING	STARTED: 05-24-06 / COMPLETED: 05-24-06
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: 26.0 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: Not Recorded	
8. TOTAL DEPTH OF BORING: 50.0 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: ,	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, clayey, 10YR 3/1 very dark gray (SC)	NR	1		SPT Sampler	2, 5, 7, 6	12
22.0	4.0		SAND, silty, 10YR 4/1 dark gray (SM)	NR	2		SPT Sampler	4, 3, 5, 4	8
20.0	6.0		SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)	NR	3		SPT Sampler	6, 8, 10, 7	18
18.0			SAND, clayey, 10YR 5/1 gray (SC)	NR	4		SPT Sampler	2, 3, 4, 6	7
16.0	10.0		From El. 18.0 to 16.0 Ft., percent fines = 17.8%, 10YR 5/1 gray	NR	5		SPT Sampler	5, 6, 6, 7	12
14.0	12.0		SAND, silty, 10YR 5/1 gray (SM)	NR	6		SPT Sampler	6, 9, 11, 12	20
12.0	14.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	7		SPT Sampler	6, 8, 11, 13	19
			SAND, poorly-graded with silt, moist, 10YR 5/1 gray (SP-SM)	NR	8		SPT Sampler	3, 7	

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☐ Database/Template Checked

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Boring Designation CB-391

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,444 Y = 1,008,631	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	11 / 12	18
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP)	NR	9		SPT Sampler	17 / 15 / 18	33
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., little shell, moist, 10YR 5/1 gray	NR	10		SPT Sampler	13 / 23 / 32	55
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., little shell, wet, 10YR 5/1 gray	NR	11		SPT Sampler	17 / 20 / 20	40
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	12		SPT Sampler	14 / 18 / 12	30
							-9.0		

15 20 25 30 35

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-391

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 3 OF 3 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,444 Y = 1,008,631	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., 10YR 5/1 gray	NR	13		SPT Sampler	12 / 14 / 23	37
							-14.0		
							Advanced Boring		
							-17.5		
			From El. -17.5 to -22.5 Ft., 10YR 5/1 gray	NR	14		SPT Sampler	12 / 17 / 21	38
							-19.0		
							Advanced Boring		
							-22.5		
			From El. -22.5 to -24.0 Ft., moist, 10YR 5/1 gray	NR	15		SPT Sampler	15 / 18 / 22	40
-24.0	50.0						-24.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-392

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-392
LOCATION COORDINATES	X = 841,429 Y = 1,009,648
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 20 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED: 05-17-06 COMPLETED: 05-18-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, trace root, 10YR 4/2 dark grayish brown (SM)	NR	1		SPT Sampler	2, 2, 3, 4	5
			From El. 24.0 to 22.0 Ft., 10YR 5/2 grayish brown	NR	2		SPT Sampler	5, 5, 6, 5	11
			From El. 22.0 to 20.0 Ft., percent fines = 16.3%, 10YR 4/2 dark grayish brown	NR	3		SPT Sampler	3, 4, 7, 7	11
			From El. 20.0 to 18.0 Ft., 10YR 5/2 grayish brown	NR	4		SPT Sampler	3, 5, 5, 7	10
18.0	8.0		SAND, clayey, soft, 10YR 6/2 light brownish gray (SC)	NR	5		SPT Sampler	5, 5, 5, 6	10
			From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	6		SPT Sampler	4, 7, 7, 8	14
14.0	12.0		SAND, poorly-graded with silt, moist, 10YR 6/3 pale brown (SP-SM)	NR	7		SPT Sampler	1, 3, 6, 11	9
			From El. 12.0 to 7.5 Ft., trace shell, 10YR 5/1 gray	NR	8		SPT Sampler	4, 6	

24.0 22.0 20.0 18.0 16.0 14.0 12.0

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Database/Template Checked

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Boring Designation CB-392

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,429 Y = 1,009,648	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	6 9	12
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, little shell, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	16 22 27	49
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., 10YR 5/1 gray	NR	10		SPT Sampler 1.0	16 24 21	45
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., 10YR 5/1 gray	NR	11		SPT Sampler -4.0	13 18 20	38
							Advanced Boring -7.5		
			From El. -7.5 to -12.5 Ft., trace shell, 10YR 5/1 gray	NR	12		SPT Sampler -9.0	13 18 20	38

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-392

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,429 Y = 1,009,648	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., trace shell, 10YR 5/1 gray	NR	13		SPT Sampler -14.0	12 / 21 / 19	40
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., 10YR 5/1 gray	NR	14		SPT Sampler -19.0	10 / 12 / 18	30
							Advanced Boring -22.5		
-22.4	48.4		SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler -24.0	12 / 14 / 16	30
							Advanced Boring -27.5		
-27.5	53.5		SAND, clayey, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SC)	NR	16		SPT Sampler -29.0	2 / 2 / 2	4

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Boring Designation CB-392

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 4 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,429 Y = 1,009,648	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring -32.5		
-37.5	63.5		CLAY, lean, soft, some shell, percent fines = 51.9%, 10YR 5/1 gray (CL)	NR	17		SPT Sampler -34.0	2 1 1	2
							Advanced Boring -37.5		
-47.5	73.5		SILT, inorganic-L, percent fines = 63.6%, 10YR 4/1 dark gray (ML)	NR	18		SPT Sampler -39.0	4 2 2	4
							Advanced Boring -42.5		
			From El. -42.5 to -47.5 Ft, percent fines = 65.9%, 10YR 4/1 dark gray	NR	19		SPT Sampler -44.0	5 6 6	12
							Advanced Boring -47.5		
-49.0	75.0		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP)	NR	20		SPT Sampler -49.0	11 11 12	23

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-392

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,429 Y = 1,009,648	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-393

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 6 SHEETS

1. PROJECT: C-44 Reservoir/STA Project	9. SIZE AND TYPE OF BIT
	10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.) — HORIZONTAL: NAD 83 — VERTICAL: NAVD88
2. BORING DESIGNATION: CB-393 — LOCATION COORDINATES: X = 841,084 Y = 1,010,825	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-55 (land-based) — ☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams — CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES — DISTURBED: 27 — UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG. FROM VERTICAL: — BEARING:	14. ELEVATION GROUND WATER: 21.0 Ft.
	15. DATE BORING — STARTED: 05-18-06 — COMPLETED: 05-18-06
6. THICKNESS OF OVERBURDEN: N/A	16. ELEVATION TOP OF BORING: 26.0 Ft.
7. DEPTH DRILLED INTO ROCK: N/A	17. TOTAL RECOVERY FOR BORING: Not Recorded
8. TOTAL DEPTH OF BORING: 110.0 Ft.	18. SIGNATURE AND TITLE OF INSPECTOR: ,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, poorly-graded, trace root, 10YR 5/1 gray (SP)	NR	1		SPT Sampler	3, 3, 3, 4	6
			From El. 24.0 to 22.0 Ft., 10YR 8/1 white	NR	2		24.0 SPT Sampler	7, 8, 8, 16	16
22.0	4.0		SAND, clayey, trace root, 10YR 5/1 gray (SC)	NR	3		22.0 SPT Sampler	2, 1, 2, 2	3
			From El. 20.0 to 18.0 Ft., 10YR 5/1 gray	NR	4		20.0 SPT Sampler	4, 5, 5, 7	10
			From El. 18.0 to 16.0 Ft., 10YR 5/1 gray	NR	5		18.0 SPT Sampler	5, 5, 6, 7	11
			From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	6		16.0 SPT Sampler	5, 6, 6, 8	12
14.0	12.0		SAND, silty, percent fines = 17.8%, 10YR 4/1 dark gray (SM)	NR	7		14.0 SPT Sampler	4, 3, 4, 6	7
12.0	14.0		SAND, poorly-graded with silt, moist, 10YR 4/1 dark gray (SP-SM)	NR	8		12.0 SPT Sampler	3, 3	

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Database/Template Checked

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Boring Designation CB-393

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 6 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,084 Y = 1,010,825	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	4 / 3	7
							10.0 Advanced Boring		
7.5	18.5		SAND, poorly-graded, wet, 10YR 5/1 gray (SP)	NR	9		SPT Sampler	7 / 19 / 23	42
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	10		SPT Sampler	12 / 15 / 15	30
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., trace shell, 10YR 5/1 gray	NR	11		SPT Sampler	13 / 16 / 19	35
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., 10YR 5/1 gray	NR	12		SPT Sampler	14 / 19 / 21	40
							-9.0		

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-393

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,084 Y = 1,010,825	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	13		SPT Sampler	11 / 14 / 17	31
							-14.0		
							Advanced Boring		
							-17.5		
			From El. -17.5 to -22.5 Ft., trace shell, 10YR 5/1 gray	NR	14		SPT Sampler	13 / 13 / 18	31
							-19.0		
							Advanced Boring		
-22.5	48.5						-22.5		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler	10 / 10 / 13	23
							-24.0		
							Advanced Boring		
							-27.5		
			From El. -27.5 to -32.5 Ft., trace shell, 10YR 5/1 gray	NR	16		SPT Sampler	11 / 11 / 6	17
							-29.0		

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-393

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 4 OF 6 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,084 Y = 1,010,825	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring		
-34.0			SAND, silty, soft, few shell, wet, 10YR 5/1 gray (SM)	NR	17		SPT Sampler	4 / 4 / 4	8
-37.5	63.5						Advanced Boring		
-39.0			CLAY, lean, few sand to gravel-sized sandstone, 10YR 4/1 dark gray (CL)	NR	18		SPT Sampler	7 / 7 / 9	16
-42.5	68.5						Advanced Boring		
-44.0			SAND, silty, 10YR 5/1 gray (SM)	NR	19		SPT Sampler	12 / 13 / 16	29
-47.5	73.5						Advanced Boring		
-49.0			SAND, poorly-graded, some shell, 10YR 5/1 gray (SP)	NR	20		SPT Sampler	9 / 7 / 7	14

55 60 65 70 75

DRAFT
Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

Boring Designation CB-393

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 6 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,084 Y = 1,010,825	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -52.5		
			From El. -52.5 to -57.5 Ft., some shell, 10YR 5/1 gray	NR	21		SPT Sampler -54.0	8 12 11	23
							Advanced Boring -57.5		
-57.5	83.5		SAND, poorly-graded with silt, few shell, 10YR 5/1 gray (SP-SM)	NR	22		SPT Sampler -59.0	10 16 17	33
							Advanced Boring -62.5		
			From El. -62.5 to -67.5 Ft., trace shell, 10YR 5/1 gray	NR	23		SPT Sampler -64.0	13 9 11	20
							Advanced Boring -67.5		
-67.5	93.5		SAND, silty, few shell, 10YR 5/1 gray (SM)	NR	24		SPT Sampler -69.0	11 18 19	37

75 80 85 90 95

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-393

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 6 OF 6 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,084 Y = 1,010,825	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-72.5	98.5						Advanced Boring -72.5		
-77.5	103.5		SAND, poorly-graded, trace shell, 10YR 5/1 gray (SP)	NR	25		SPT Sampler -74.0	12 15 17	32
							Advanced Boring -77.5		
			SAND, silty, few fine to coarse-grained sand-sized sandstone, trace shell, 10YR 5/1 gray (SM)	NR	26		SPT Sampler -79.0	7 8 8	16
							Advanced Boring -82.5		
-84.0	110.0		From El. -82.5 to -84.0 Ft., little shell, few fine to coarse-grained sand-sized sandstone, 10YR 5/1 gray	NR	27		SPT Sampler -84.0	11 11 11	22

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

95 100 105 110 115

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-394

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-394
LOCATION COORDINATES	X = 841,392 Y = 1,011,697
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 15 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 05-18-06 / COMPLETED 05-19-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, 10YR 3/3 dark brown (SM)	NR	1		SPT Sampler	3 4 4 4	8
22.0	4.0		SAND, poorly-graded with silt, trace root, 10YR 3/3 dark brown (SP-SM)	NR	2		SPT Sampler	5 7 8 9	15
20.0	6.0		SAND, clayey, 10YR 3/3 dark brown (SC) ▼	NR	3		SPT Sampler	3 4 5 5	9
			SAND, silty, percent fines = 17.8%, 10YR 5/1 gray (SM)	NR	4		SPT Sampler	3 6 7 7	13
			From El. 18.0 to 16.0 Ft., 10YR 5/1 gray	NR	5		SPT Sampler	6 8 10 11	18
			From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	6		SPT Sampler	5 7 10 11	17
12.0	14.0		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 4/2 dark grayish brown (SP-SM)	NR	7		SPT Sampler	7 6 10 NR	16
			SAND, poorly-graded with silt, mostly fine to coarse-grained sand-sized shell, 10YR 4/2 dark grayish brown (SP-SM)	NR	8		SPT Sampler	7 22	

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☒ Geology/Nomenclature Checked
☐ Database/Template Checked

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Boring Designation CB-394

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,392 Y = 1,011,697	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	16 / NR	38
							10.0 Advanced Boring		
7.5	18.5						7.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP)	NR	9		SPT Sampler	17 / 21 / 26	47
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., trace shell, 10YR 5/1 gray				2.5		
				NR	10		SPT Sampler	15 / 21 / 14	35
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., some shell, 10YR 5/1 gray				-2.5		
				NR	11		SPT Sampler	17 / 19 / 17	36
							-4.0 Advanced Boring		
			From El. -7.5 to -12.5 Ft., 10YR 5/1 gray				-7.5		
				NR	12		SPT Sampler	12 / 14 / 16	30
							-9.0		

15 20 25 30 35

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-394

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,392 Y = 1,011,697	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., 10YR 5/1 gray	NR	13		SPT Sampler	11 / 13 / 16	29
							-14.0		
							Advanced Boring		
							-17.5		
			From El. -17.5 to -22.5 Ft., trace shell, 10YR 5/1 gray	NR	14		SPT Sampler	13 / 12 / 16	28
							-19.0		
							Advanced Boring		
-22.5	48.5						-22.5		
			SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler	9 / 9 / 13	22
-24.0	50.0						-24.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-395

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-395
LOCATION COORDINATES	X = 843,142 Y = 1,012,056
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
☒ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 05-19-06 / COMPLETED 05-19-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, trace root, 10YR 4/1 dark gray (SM)	NR	1		SPT Sampler	2 2 2 2	4
22.0	4.0		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)	NR	2		SPT Sampler	2 2 3 5	5
20.0	6.0		SAND, silty, 10YR 3/3 dark brown (SM)	NR	3		SPT Sampler	5 6 5 6	11
18.0	8.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	4		SPT Sampler	5 6 6 7	12
16.0			SAND, silty, percent fines = 15.4%, 5G 6/1 greenish gray (SM)	NR	5		SPT Sampler	6 5 7 3	12
14.0	12.0		From El. 16.0 to 14.0 Ft., 10YR 2/2 very dark brown	NR	6		SPT Sampler	3 5 6 7	11
12.0	14.0		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SP)	NR	7		SPT Sampler	14 31 23 26	54
			SAND, poorly-graded with silt, some fine to medium-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	8		SPT Sampler	20 26	

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Boring Designation CB-395

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 843,142 Y = 1,012,056	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	30 / 32	56
							Advanced Boring 7.5		
7.5	18.5		LIMESTONE, coquina, 10YR 5/1 gray	NR	9		SPT Sampler 6.0	50/4	
							Advanced Boring 2.5		
2.5	23.5		SAND, poorly-graded, trace shell, 10YR 5/1 gray (SP)	NR	10		SPT Sampler 1.0	16 / 20 / 18	38
							Advanced Boring -2.5		
-4.0	30.0		From El. -2.5 to -4.0 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	17 / 16 / 16	32

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-396

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-396
LOCATION COORDINATES	X = 845,584 Y = 1,012,064
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	20.0 Ft.
15. DATE BORING	STARTED 05-22-06 / COMPLETED 05-22-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 5/2 grayish brown (SM)	NR	1		SPT Sampler	3 3 2 2	5
24.0	2.0						24.0		
			SAND, clayey, 10YR 6/3 pale brown (SC)	NR	2		SPT Sampler	2 2 2 3	4
			From El. 22.0 to 20.0 Ft., 10YR 6/2 light brownish gray	NR	3		SPT Sampler	4 3 4 5	7
			From El. 20.0 to 18.0 Ft., percent fines = 25.2%, 10YR 7/3 very pale brown	NR	4		SPT Sampler	2 4 4 6	8
			From El. 18.0 to 16.0 Ft., percent fines = 24.7%, 10YR 7/1 light gray	NR	5		SPT Sampler	5 8 6 8	14
			From El. 16.0 to 14.0 Ft., 10YR 7/1 light gray	NR	6		SPT Sampler	6 7 8 6	15
			From El. 14.0 to 12.0 Ft., few sandstone up to 1/4, 5Y 7/1 light gray	NR	7		SPT Sampler	4 5 3 4	8
			From El. 12.0 to 7.5 Ft., 5Y 7/1 light gray	NR	8		SPT Sampler	5 5	

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Database/Template Checked
Geology/Nomenclature Checked
Initial Data Entry Checked

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Boring Designation CB-396

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County		SHEET 2 OF 2 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83	VERTICAL: NAVD88
LOCATION COORDINATES: X = 845,584 Y = 1,012,064	ELEVATION TOP OF BORING: 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	6 / 7	11
							10.0 Advanced Boring		
7.5	18.5						7.5		
			SAND, silty, trace shell, 10YR 5/1 gray (SM)	NR	9		SPT Sampler	1 / 2 / 2	4
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., little shell, 10YR 5/1 gray	NR	10		2.5 SPT Sampler	4 / 1 / 3	4
							1.0 Advanced Boring		
-2.5	28.5						-2.5		
			LIMESTONE, coquina, soft, 10YR 5/1 gray	NR	11		SPT Sampler	50/4	
-4.0	30.0						-4.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-397

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-397
LOCATION COORDINATES	X = 842,822 Y = 1,009,770
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	20.0 Ft.
15. DATE BORING	STARTED 05-24-06 / COMPLETED 05-24-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, trace root, 10YR 5/2 grayish brown (SM)	NR	1		SPT Sampler	1 1 4 4	5
			From El. 24.0 to 22.0 Ft., 10YR 5/2 grayish brown	NR	2		24.0 SPT Sampler	6 10 12 14	22
			From El. 22.0 to 20.0 Ft., 10YR 2/2 very dark brown	NR	3		22.0 SPT Sampler	6 7 9 8	16
20.0	6.0						20.0		
			SAND, poorly-graded with silt, 10YR 4/3 brown (SP-SM)	NR	4		SPT Sampler	5 8 9 10	17
18.0	8.0						18.0		
			SAND, poorly-graded, 10YR 6/3 pale brown (SP)	NR	5		SPT Sampler	5 7 10 11	17
			From El. 16.0 to 14.0 Ft., 10YR 6/2 light brownish gray	NR	6		16.0 SPT Sampler	4 6 5 8	11
14.0	12.0						14.0		
			SAND, clayey, percent fines = 21.6%, 5BG 5/1 greenish gray (SC)	NR	7		SPT Sampler	5 7 6 12	13
12.0	14.0						12.0		
			SAND, poorly-graded with silt, mostly fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	8		SPT Sampler	7 7	

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☒ Geology/Hydrostructure Checked
☐ Database/Template Checked

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Boring Designation CB-397

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 842,822 Y = 1,009,770	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	9 / 13	16
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	15 / 28 / 33	61
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., little shell, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	15 / 26 / 31	57
							Advanced Boring -2.5		
			From El. -2.5 to -4.0 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	16 / 25 / 28	53
-4.0	30.0								

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-398

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT: C-44 Reservoir/STA Project	9. SIZE AND TYPE OF BIT
	10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.) — HORIZONTAL: NAD 83 — VERTICAL: NAVD88
2. BORING DESIGNATION: CB-398 — LOCATION COORDINATES: X = 844,180 Y = 1,010,714	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-45 (land-based) — ☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams — CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES — DISTURBED: 11 — UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG. FROM VERTICAL: — BEARING:	14. ELEVATION GROUND WATER: 20.0 Ft.
	15. DATE BORING — STARTED: 05-25-06 — COMPLETED: 05-25-06
6. THICKNESS OF OVERBURDEN: N/A	16. ELEVATION TOP OF BORING: 26.0 Ft.
7. DEPTH DRILLED INTO ROCK: N/A	17. TOTAL RECOVERY FOR BORING: Not Recorded
8. TOTAL DEPTH OF BORING: 30.0 Ft.	18. SIGNATURE AND TITLE OF INSPECTOR: ,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, few root, 10YR 6/4 light yellowish brown (SM)	NR	1		SPT Sampler 24.0	3, 4, 4, 5	8
			SAND, poorly-graded with silt, 10YR 6/2 light brownish gray (SP-SM)	NR	2		SPT Sampler 22.0	2, 3, 3, 6	6
20.0	6.0		From El. 22.0 to 20.0 Ft., trace root, 10YR 5/2 grayish brown	NR	3		SPT Sampler 20.0	4, 3, 3, 3	6
			SAND, clayey, percent fines = 19.6%, 10YR 5/1 gray (SC)	NR	4		SPT Sampler 18.0	3, 4, 3, 5	7
			From El. 18.0 to 16.0 Ft., percent fines = 18.9%, 10YR 5/1 gray	NR	5		SPT Sampler 16.0	3, 6, 9, 13	15
14.0	12.0		From El. 16.0 to 14.0 Ft., hard, 10YR 7/1 light gray	NR	6		SPT Sampler 14.0	5, 7, 10, 13	17
12.0	14.0		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	7		SPT Sampler 12.0	3, 5, 9, 13	14
			SAND, poorly-graded, mostly fine-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	8		SPT Sampler	15, 20	

0 5 10 15

DRAFT
Initial Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

(Continued)

Boring Designation CB-398

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 844,180 Y = 1,010,714	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	24 28	44
7.5	18.5						Advanced Boring 7.5		
			SAND, well-graded, mostly fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SW)	NR	9		SPT Sampler 6.0	16 12 10	22
2.5	23.5						Advanced Boring 2.5		
			SAND, poorly-graded, little shell, wet, 10YR 5/1 gray (SP)	NR	10		SPT Sampler 1.0	11 14 16	30
							Advanced Boring -2.5		
-4.0	30.0		From El. -2.5 to -4.0 Ft., few shell, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	15 27 23	50

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-399

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-399
LOCATION COORDINATES	X = 845,928 Y = 1,009,315
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 11 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	20.0 Ft.
15. DATE BORING	STARTED: 05-25-06 COMPLETED: 05-25-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, silty, 10YR 3/1 very dark gray (SM)	NR	1		SPT Sampler	3 4 6 7	10
22.0	4.0		SAND, poorly-graded with silt, 10YR 5/3 brown (SP-SM)	NR	2		SPT Sampler	6 9 9 9	18
18.0	8.0		SAND, clayey, percent fines = 21.6%, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	5 5 8 7	13
			From El. 20.0 to 18.0 Ft., percent fines = 21.6%, 5GY 5/1 greenish gray	NR	4		SPT Sampler	5 7 7 8	14
16.0	10.0		SAND, poorly-graded with silt, wet, 10YR 5/1 gray (SP-SM)	NR	5		SPT Sampler	10 9 8 6	17
14.0	12.0		GRAVEL, silty, 10YR 5/1 gray (GM)	NR	6		SPT Sampler	8 9 11 14	20
12.0	14.0		SAND, silty, few limestone up to 1, 10YR 5/1 gray (SM)	NR	7		SPT Sampler	11 11 14 24	25
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SP-SM)	NR	8		SPT Sampler	28 18	

DRAFT
Initial Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

(Continued)

Boring Designation CB-399

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 845,928 Y = 1,009,315	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	16 / 12	34
							Advanced Boring 7.5		
7.5	18.5		SAND, well-graded, mostly fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SW)	NR	9		SPT Sampler 6.0	26 / 32 / 40	72
							Advanced Boring 2.5		
2.5	23.5		SAND, poorly-graded, trace shell, 10YR 5/1 gray (SP)	NR	10		SPT Sampler 1.0	18 / 22 / 28	50
							Advanced Boring -2.5		
			From El. -2.5 to -4.0 Ft., few shell, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	16 / 23 / 20	43
-4.0	30.0								

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-400

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT: C-44 Reservoir/STA Project	9. SIZE AND TYPE OF BIT
	10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.) — HORIZONTAL: NAD 83 — VERTICAL: NAVD88
2. BORING DESIGNATION: CB-400 — LOCATION COORDINATES: X = 844,216 Y = 1,008,194	11. MANUFACTURER'S DESIGNATION OF DRILL: CME-45 (land-based) — ☒ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Williams — CONTRACTOR FILE NO.: 06-026B	12. TOTAL SAMPLES — DISTURBED: 11 — UNDISTURBED (UD): 0
4. NAME OF DRILLER: J. Derubeis	13. TOTAL NUMBER CORE BOXES: 0
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED — DEG. FROM VERTICAL: — BEARING:	14. ELEVATION GROUND WATER: 20.0 Ft.
	15. DATE BORING — STARTED: 05-25-06 — COMPLETED: 05-25-06
6. THICKNESS OF OVERBURDEN: N/A	16. ELEVATION TOP OF BORING: 26.0 Ft.
7. DEPTH DRILLED INTO ROCK: N/A	17. TOTAL RECOVERY FOR BORING: Not Recorded
8. TOTAL DEPTH OF BORING: 30.0 Ft.	18. SIGNATURE AND TITLE OF INSPECTOR: ,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, poorly-graded, trace clay, 10YR 6/3 pale brown (SP)	NR	1		SPT Sampler	2, 4, 7, 6	11
			From El. 24.0 to 22.0 Ft., 10YR 7/3 very pale brown	NR	2		24.0 SPT Sampler	9, 11, 7, 5	18
22.0	4.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	3		22.0 SPT Sampler	6, 5, 8, 7	13
			From El. 20.0 to 18.0 Ft., percent fines = 20.6%, 10YR 5/1 gray	NR	4		20.0 SPT Sampler	3, 5, 5, 6	10
			From El. 18.0 to 16.0 Ft., percent fines = 21.0%, 5BG 5/1 greenish gray	NR	5		18.0 SPT Sampler	5, 5, 7, 8	12
			From El. 16.0 to 14.0 Ft., 5BG 5/1 greenish gray	NR	6		16.0 SPT Sampler	4, 5, 7, 10	12
14.0	12.0		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	7		14.0 SPT Sampler	14, 15, 17, 21	32
12.0	14.0		SAND, silty, some fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SM)	NR	8		12.0 SPT Sampler	14, 23	

0 5 10 15

DRAFT
Geology/Nomenclature Checked
Database/Template Checked
Initial Data Entry Checked

(Continued)

Boring Designation CB-400

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 844,216 Y = 1,008,194	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	30 / 40	53
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, few shell, wet, 10YR 5/1 gray (SP)	NR	9		SPT Sampler 6.0	7 / 18 / 15	33
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., few shell, wet, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	13 / 11 / 9	20
							Advanced Boring -2.5		
			From El. -2.5 to -4.0 Ft., trace shell, moist, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	9 / 15 / 14	29
-4.0	30.0								

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-401

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-401
LOCATION COORDINATES	X = 847,213 Y = 1,012,034
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
☒ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 05-26-05 / COMPLETED 05-26-05
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, trace root, 10YR 4/2 dark grayish brown (SM)	NR	1		SPT Sampler	5 5 5 6	10
24.0	2.0						24.0		
			SAND, clayey, soft, percent fines = 16.7%, 10YR 7/1 light gray (SC)	NR	2		SPT Sampler	3 3 4 3	7
			From El. 22.0 to 20.0 Ft., few sand to gravel-sized sandstone, 10YR 7/1 light gray	NR	3		SPT Sampler	3 4 7 11	11
20.0	6.0						20.0		
			SAND, silty, 10YR 7/1 light gray (SM)	NR	4		SPT Sampler	7 13 14 16	27
			From El. 18.0 to 16.0 Ft., 10YR 7/1 light gray	NR	5		SPT Sampler	7 9 21 17	30
16.0	10.0						16.0		
			SAND, clayey, moist, percent fines = 19.8%, 5GY 5/1 greenish gray (SC)	NR	6		SPT Sampler	7 9 10 11	19
			From El. 14.0 to 12.0 Ft., soft, trace shell, moist, percent fines = 23.2%, 5GY 5/1 greenish gray	NR	7		SPT Sampler	2 2 2 2	4
							12.0		
			From El. 12.0 to 7.5 Ft., trace shell, 10YR 7/1 light gray	NR	8		SPT Sampler	3 5	

DRAFT
☒ Initial Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

(Continued)

Boring Designation CB-401

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 847,213 Y = 1,012,034	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	5 / 7	10
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded with silt, few shell, wet, 10YR 5/1 gray (SP-SM)	NR	9		SPT Sampler 6.0	3 / 3 / 2	5
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., trace shell, wet, percent fines = 8.4%, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	2 / 4 / 8	12
							Advanced Boring -2.5		
-2.5	28.5		SAND, poorly-graded, trace shell, 10YR 5/1 gray (SP)	NR	11		SPT Sampler -4.0	8 / 11 / 13	24
-4.0	30.0								

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-402

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-402
LOCATION COORDINATES	X = 846,332 Y = 1,011,225
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
☒ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 06-08-06 / COMPLETED 06-08-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 3/2 very dark grayish brown (SM)	NR	1		SPT Sampler	15, 13, 7, 6	20
			From El. 24.0 to 22.0 Ft., 10YR 3/2 very dark grayish brown	NR	2		SPT Sampler	3, 5, 7, 5	12
22.0	4.0		SAND, clayey, 10YR 2/2 very dark brown (SC)	NR	3		SPT Sampler	3, 4, 2, 3	6
			From El. 20.0 to 18.0 Ft., 10YR 4/1 dark gray	NR	4		SPT Sampler	3, 4, 2, 3	6
			From El. 18.0 to 16.0 Ft., 10YR 6/2 light brownish gray	NR	5		SPT Sampler	2, 4, 4, 2	8
			From El. 16.0 to 14.0 Ft., few shell, 10YR 6/2 light brownish gray	NR	6		SPT Sampler	2, 3, 5, 8	8
			From El. 14.0 to 12.0 Ft., few shell, moist, 10YR 6/2 light brownish gray	NR	7		SPT Sampler	3, 3, 5, 5	8
			From El. 12.0 to 7.5 Ft., few shell, moist, 10YR 6/2 light brownish gray	NR	8		SPT Sampler	2, 3	

DRAFT
☒ Initial Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

(Continued)

Boring Designation CB-402

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 846,332 Y = 1,011,225	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	7 / 8	10
							10.0 Advanced Boring		
7.5	18.5						7.5		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	9		SPT Sampler	2 / 1 / 1	2
							6.0 Advanced Boring		
2.5	23.5						2.5		
			SAND, silty, few shell, wet, 10YR 5/1 gray (SM)	NR	10		SPT Sampler	2 / 2 / 2	4
							1.0 Advanced Boring		
-2.5	28.5						-2.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	11		SPT Sampler	14 / 24 / 29	53
-4.0	30.0						-4.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

Boring Designation CB-403

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-403
LOCATION COORDINATES	X = 848,393 Y = 1,010,944
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	22.0 Ft.
15. DATE BORING	STARTED 05-26-05 / COMPLETED 05-26-05
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 4/2 dark grayish brown (SM)	NR	1		SPT Sampler	4 5 7 5	12
			From El. 24.0 to 22.0 Ft., 10YR 7/1 light gray				24.0		
				NR	2		SPT Sampler	6 6 7 5	13
22.0	4.0						22.0		
			SAND, clayey, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	3 3 3 3	6
			From El. 20.0 to 18.0 Ft., trace shell, 10YR 5/1 gray				20.0		
				NR	4		SPT Sampler	2 3 3 3	6
			From El. 18.0 to 16.0 Ft., 10YR 4/1 dark gray				18.0		
				NR	5		SPT Sampler	3 5 8 6	13
16.0	10.0						16.0		
			SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	6		SPT Sampler	7 14 12 11	26
14.0	12.0						14.0		
			SAND, silty, percent fines = 15.6%, 5GY 6/1 greenish gray (SM)	NR	7		SPT Sampler	3 2 2 2	4
			From El. 12.0 to 7.5 Ft., trace shell, moist, 5GY 6/1 greenish gray				12.0		
				NR	8		SPT Sampler	1 1	

DRAFT
Initial Data Entry Checked
Geology/Hydrostructure Checked
Database/Template Checked

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Boring Designation CB-403

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 848,393 Y = 1,010,944	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	1 1	2
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded with silt, few shell, 10YR 4/1 dark gray (SP-SM)	NR	9		SPT Sampler 6.0	8 9 11	20
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., trace shell, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	7 13 14	27
							Advanced Boring -2.5		
-2.5	28.5		SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	11		SPT Sampler -4.0	6 6 9	15
-4.0	30.0								

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-404

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-404
LOCATION COORDINATES	X = 848,237 Y = 1,007,486
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	23.5 Ft.
15. DATE BORING	STARTED 05-26-05 / COMPLETED 05-26-05
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, poorly-graded with silt, 10YR 6/3 pale brown (SP-SM)	NR	1		SPT Sampler	3 4 5 4	9
24.0	2.0						24.0		
			SAND, silty, 10YR 6/3 pale brown (SM)	NR	2		SPT Sampler	3 7 7 3	14
			From El. 22.0 to 20.0 Ft., 10YR 6/3 pale brown	NR	3		SPT Sampler	4 6 9 9	15
20.0	6.0						20.0		
			SAND, clayey, 10YR 5/1 gray (SC)	NR	4		SPT Sampler	6 7 11 10	18
			From El. 18.0 to 16.0 Ft., 10YR 5/1 gray	NR	5		SPT Sampler	4 7 9 13	16
			From El. 16.0 to 14.0 Ft., percent fines = 22.3%, 5GY 5/1 greenish gray	NR	6		SPT Sampler	3 4 4 5	8
			From El. 14.0 to 12.0 Ft., soft, trace shell, percent fines = 28.1%, 5GY 5/1 greenish gray	NR	7		SPT Sampler	2 2 2 2	4
			From El. 12.0 to 7.5 Ft., 5GY 5/1 greenish gray	NR	8		SPT Sampler	2 3	

DRAFT
☒ Initial Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

(Continued)

Boring Designation CB-404

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 848,237 Y = 1,007,486	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	3 / 5	6
							10.0 Advanced Boring		
			From El. 7.5 to 2.5 Ft., soft, trace shell, moist, 10YR 5/1 gray	NR	9		7.5 SPT Sampler	1 / 1 / 1	2
							6.0 Advanced Boring		
2.5	23.5		SAND, silty, wet, 10YR 5/1 gray (SM)	NR	10		2.5 SPT Sampler	2 / 3 / 4	7
							1.0 Advanced Boring		
-2.5	28.5		CLAY, lean, soft, percent fines = 91.5%, 10YR 4/1 dark gray (CL)	NR	11		-2.5 SPT Sampler	4 / 2 / 3	5
-4.0	30.0						-4.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-405

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-405
LOCATION COORDINATES	X = 846,438 Y = 1,007,474
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
☒ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 05-31-05 / COMPLETED 05-31-05
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 5/2 grayish brown (SM)	NR	1		SPT Sampler	3 2 2 4	4
			From El. 24.0 to 22.0 Ft., 10YR 4/2 dark grayish brown				24.0		
				NR	2		SPT Sampler	3 4 10 10	14
22.0	4.0						22.0		
			SAND, clayey, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	4 6 8 8	14
			From El. 20.0 to 18.0 Ft., trace shell, 5G 6/1 greenish gray				20.0		
				NR	4		SPT Sampler	5 7 11 13	18
			From El. 18.0 to 16.0 Ft., soft few shell, percent fines = 26.8%, 10YR 7/1 light gray				18.0		
				NR	5		SPT Sampler	7 4 5 5	9
			From El. 16.0 to 14.0 Ft., soft, 10YR 7/1 light gray				16.0		
				NR	6		SPT Sampler	3 5 6 6	11
14.0	12.0						14.0		
			SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	7		SPT Sampler	5 5 6 7	11
			From El. 12.0 to 7.5 Ft., trace shell, 10YR 5/1 gray				12.0		
				NR	8		SPT Sampler	6 8	

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Geology/Nomenclature Checked
Database/Template Checked
Initial Data Entry Checked

(Continued)

Boring Designation CB-405

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 846,438 Y = 1,007,474	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	10 11	18
							10.0 Advanced Boring		
7.5	18.5						7.5		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 5/2 grayish brown (SP-SM)	NR	9		7.0 SPT Sampler	50/5	
							Advanced Boring		
2.5	23.5						2.5		
			SHELL	NR	10		2.0 SPT Sampler	50/1	
							Advanced Boring		
-2.5	28.5						-2.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	11		SPT Sampler	23 21 17	38
-4.0	30.0						-4.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-407

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-407
LOCATION COORDINATES	X = 847,785 Y = 1,012,475
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	30.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.5 Ft.
15. DATE BORING	STARTED 06-06-06 / COMPLETED 06-06-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 4/2 dark grayish brown (SM)	NR	1		SPT Sampler	5 5 4 5	9
24.0	2.0						24.0		
			SAND, clayey, 10YR 5/2 grayish brown (SC)	NR	2		SPT Sampler	3 3 3 4	6
22.0	4.0						22.0		
			SAND, silty, 10YR 5/6 yellowish brown (SM)	NR	3		SPT Sampler	2 3 8 7	11
			From El. 20.0 to 18.0 Ft., 10YR 3/3 dark brown	NR	4		SPT Sampler	6 10 11 11	21
			From El. 18.0 to 16.0 Ft., percent fines = 14.8%, 10YR 5/1 gray	NR	5		SPT Sampler	5 9 9 8	18
16.0	10.0						16.0		
			SAND, clayey, soft, few shell, percent fines = 43.4%, 5GY 5/1 greenish gray (SC)	NR	6		SPT Sampler	4 4 5 4	9
			From El. 14.0 to 12.0 Ft., soft, few shell, 5GY 5/1 greenish gray	NR	7		SPT Sampler	3 3 2 4	5
			From El. 12.0 to 7.5 Ft., soft, 5GY 5/1 greenish gray	NR	8		SPT Sampler	2 3	

DRAFT
☒ Initial Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

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Boring Designation CB-407

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 847,785 Y = 1,012,475	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	5 / 5	8
							10.0 Advanced Boring		
7.5	18.5						7.5		
			SAND, poorly-graded with silt, few shell, 10YR 5/1 gray (SP-SM)	NR	9		SPT Sampler	8 / 10 / 11	21
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., moist, 10YR 5/1 gray	NR	10		SPT Sampler	10 / 11 / 14	25
							1.0 Advanced Boring		
							-2.5		
-4.0	30.0		From El. -2.5 to -4.0 Ft., few fine to coarse-grained sand-sized shell up to 1/8, 10YR 5/1 gray	NR	11		SPT Sampler	15 / 21 / 24	45
							-4.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-411

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-411
LOCATION COORDINATES	X = 850,193 Y = 982,206
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 20 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	11.0 Ft.
15. DATE BORING	STARTED: 06-09-06 COMPLETED: 06-09-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, poorly-graded with silt, trace shell, 10YR 6/3 pale brown (SP-SM)		1		Hand Auger		
22.0			SAND, poorly-graded, little fine sand to coarse gravel-sized shell, 10YR 7/3 very pale brown (SP)		2		Hand Auger		
20.0			From El. 22.0 to 20.0 Ft., some fine sand to coarse gravel-sized shell, 10YR 7/3 very pale brown		3		Hand Auger		
18.0			From El. 20.0 to 18.0 Ft., 10YR 7/1 light gray	NR	4		SPT Sampler	9 14 15 11	29
16.0	10.0		From El. 18.0 to 16.0 Ft., 10YR 8/1 white	NR	5		SPT Sampler	8 13 12 15	25
14.0	12.0		SAND, silty, 10YR 5/1 gray (SM)	NR	6		SPT Sampler	5 8 8 8	16
12.0	14.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	7		SPT Sampler	5 7 8 9	15
			SAND, silty, 10YR 5/1 gray (SM)	NR	8		SPT Sampler	9 12	

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☐ Database/Template Checked

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Boring Designation CB-411

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 850,193 Y = 982,206	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	14 16	26
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded, 10YR 5/2 grayish brown (SP)	NR	9		SPT Sampler 6.0	4 5 7	12
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., some fine sand to coarse sand sized shell, 10YR 5/1 gray	NR	10		SPT Sampler 1.0	9 12 14	26
							Advanced Boring -2.5		
-2.5	28.5		SAND, poorly-graded, mostly fine sand to coarse sand sized shell, 10YR 5/1 gray (SP)	NR	11		SPT Sampler -4.0	10 15 14	29
							Advanced Boring -7.5		
			From El. -7.5 to -12.5 Ft., 10YR 5/1 gray	NR	12		SPT Sampler -9.0	13 16 17	33

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-411

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 850,193 Y = 982,206	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., 10YR 5/1 gray	NR	13		SPT Sampler -14.0	12 11 14	25
							Advanced Boring -17.5		
-17.5	43.5		SAND, poorly-graded with silt, some fine sand to coarse sand sized shell, 10YR 5/2 grayish brown (SP-SM)	NR	14		SPT Sampler -19.0	5 7 9	16
							Advanced Boring -22.5		
-22.5	48.5		SAND, poorly-graded, some fine sand to coarse sand sized shell, 10YR 5/1 gray (SP)	NR	15		SPT Sampler -24.0	6 8 8	16
							Advanced Boring -27.5		
			From El. -27.5 to -32.5 Ft., some fine sand to coarse sand sized shell, 10YR 5/1 gray	NR	16		SPT Sampler -29.0	5 7 8	15

35 40 45 50 55

DRAFT
Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

Boring Designation CB-411

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 4 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 850,193 Y = 982,206	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring -32.5		
-37.5	63.5		SAND, poorly-graded with silt, few shell, 10YR 5/1 gray (SP-SM)	NR	17		SPT Sampler -34.0	10 13 17	30
							Advanced Boring -37.5		
			SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	18		SPT Sampler -39.0	13 16 20	36
							Advanced Boring -42.5		
			From El. -42.5 to -47.5 Ft., some fine sand to coarse sand sized shell, 10YR 5/1 gray	NR	19		SPT Sampler -44.0	11 12 15	27
							Advanced Boring -47.5		
-49.0	75.0		From El. -47.5 to -49.0 Ft., some fine sand to coarse sand sized shell, 10YR 5/1 gray	NR	20		SPT Sampler -49.0	14 13 7	20

55 60 65 70 75

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-411

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 850,193 Y = 982,206	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

75
80
85
90
95

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-412

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-412
LOCATION COORDINATES	X = 840,874 Y = 997,884
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 15 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	18.0 Ft.
15. DATE BORING	STARTED: 06-12-06 COMPLETED: 06-12-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, poorly-graded, 10YR 7/1 light gray (SP)	NR	1		SPT Sampler	5 5 4 5	9
22.0	4.0		SAND, silty, 10YR 5/1 gray (SM)	NR	2		SPT Sampler	4 4 5 6	9
20.0			SAND, clayey, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	2 1 3 2	4
18.0			From El. 20.0 to 18.0 Ft., hard, 10YR 7/1 light gray	NR	4		SPT Sampler	4 8 9 10	17
16.0	10.0		From El. 18.0 to 16.0 Ft., hard, 10YR 5/1 gray	NR	5		SPT Sampler	4 5 4 3	9
14.0	12.0		SAND, silty, 10YR 5/1 gray (SM)	NR	6		SPT Sampler	1 2 2 1	4
12.0	14.0		SAND, poorly-graded with silt, some fine sand to coarse sand sized shell, wet, 10YR 4/1 dark gray (SP-SM)	NR	7		SPT Sampler	1 1 4 7	5
			SAND, poorly-graded, some fine sand to coarse sand sized shell, 10YR 5/1 gray (SP)	NR	8		SPT Sampler	6 6	

DRAFT
☒ Initial Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

(Continued)

Boring Designation CB-412

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 3 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,874 Y = 997,884	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	10 / 11	16
							Advanced Boring 7.5		
7.5	18.5		SAND, well-graded, 10YR 4/1 dark gray (SW)	NR	9		SPT Sampler 6.0	6 / 7 / 11	18
							Advanced Boring 2.5		
2.5	23.5		SAND, poorly-graded, 10YR 5/1 gray (SP)	NR	10		SPT Sampler 1.0	20 / 14 / 16	30
							Advanced Boring -2.5		
-2.5	28.5		SAND, poorly-graded with silt, wet, 10YR 5/1 gray (SP-SM)	NR	11		SPT Sampler -4.0	9 / 11 / 15	26
							Advanced Boring -7.5		
-7.5	33.5		SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	12		SPT Sampler -9.0	7 / 9 / 8	17

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-412

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,874 Y = 997,884	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., wet, 10YR 5/1 gray	NR	13		SPT Sampler -14.0	6 3 12	15
							Advanced Boring -17.5		
-17.5	43.5		SAND, silty, few shell, 10YR 5/1 gray (SM)	NR	14		SPT Sampler -19.0	6 7 4	11
							Advanced Boring -22.5		
-22.5	48.5								
-24.0	50.0		SAND, poorly-graded with clay, few shell, wet, 10YR 4/1 dark gray (SP-SC)	NR	15		SPT Sampler -24.0	4 3 3	6

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

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Geology/Nomenclature Checked
Initial/Data Entry Checked

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Boring Designation CB-413

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 6 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-413
LOCATION COORDINATES	X = 840,789 Y = 998,117
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	110.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 27 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	18.0 Ft.
15. DATE BORING	STARTED 06-12-06 / COMPLETED 06-12-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, clayey, 10YR 7/3 very pale brown (SC)	NR	1		SPT Sampler	4 6 6 4	12
24.0	2.0						24.0		
			SAND, silty, 10YR 5/1 gray (SM)	NR	2		SPT Sampler	2 6 7 7	13
22.0	4.0						22.0		
			SAND, clayey, 10YR 5/1 gray (SC)	NR	3		SPT Sampler	3 2 7 7	9
			From El. 20.0 to 18.0 Ft., 10YR 4/1 dark gray	NR	4		SPT Sampler	6 5 5 6	10
			From El. 18.0 to 16.0 Ft., 5G 5/1 greenish gray	NR	5		SPT Sampler	5 5 5 7	10
			From El. 16.0 to 14.0 Ft., 5G 5/1 greenish gray	NR	6		SPT Sampler	2 2 2 2	4
14.0	12.0						14.0		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	7		SPT Sampler	5 8 14 16	22
12.0	14.0						12.0		
			SAND, silty, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SM)	NR	8		SPT Sampler	13 17	

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☒ Initial Data Entry Checked

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Boring Designation CB-413

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County	SHEET 2 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,789 Y = 998,117	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	20 / 23	37
							10.0 Advanced Boring		
7.5	18.5						7.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 4/2 dark grayish brown (SP)	NR	9		SPT Sampler	11 / 15 / 21	36
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 4/2 dark grayish brown	NR	10		2.5 SPT Sampler	15 / 14 / 5	19
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., few shell, wet, 10YR 4/1 dark gray	NR	11		-2.5 SPT Sampler	8 / 9 / 13	22
							-4.0 Advanced Boring		
-7.5	33.5						-7.5		
			SAND, poorly-graded with silt, few shell, wet, 10YR 4/1 dark gray (SP-SM)	NR	12		SPT Sampler	7 / 6 / 8	14
							-9.0		

15 20 25 30 35

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Initial/Data Entry Checked

Boring Designation CB-413

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,789 Y = 998,117	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., few shell, 10YR 4/1 dark gray	NR	13		SPT Sampler -14.0	11 7 10	17
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., few shell, 10YR 5/1 gray	NR	14		SPT Sampler -19.0	9 6 6	12
							Advanced Boring -22.5		
-22.5	48.5		SAND, poorly-graded with clay, few shell, 10YR 5/1 gray (SP-SC)	NR	15		SPT Sampler -24.0	4 6 4	10
							Advanced Boring -27.5		
-27.5	53.5		SAND, silty, some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SM)	NR	16		SPT Sampler -29.0	3 4 4	8

35 40 45 50 55

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Boring Designation CB-413

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 4 OF 6 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 840,789 Y = 998,117	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring		
-37.5	63.5		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP-SM)	NR	17		SPT Sampler (-32.5 to -34.0)	9, 11, 15	26
							Advanced Boring (-34.0 to -37.5)		
			SAND, poorly-graded, few shell, 10YR 5/1 gray (SP)	NR	18		SPT Sampler (-37.5 to -39.0)	12, 17, 20	37
							Advanced Boring (-39.0 to -42.5)		
			From El. -42.5 to -47.5 Ft., some fine to coarse-grained sand-sized shell up to 1/4", 10YR 5/1 gray	NR	19		SPT Sampler (-42.5 to -44.0)	9, 9, 12	21
							Advanced Boring (-44.0 to -47.5)		
			From El. -47.5 to -52.5 Ft., little shell, 10YR 5/1 gray	NR	20		SPT Sampler (-47.5 to -49.0)	6, 7, 12	19

55 60 65 70 75

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Boring Designation CB-413

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 5 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 840,789 Y = 998,117	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-52.5		
			From El. -52.5 to -57.5 Ft., little shell, 10YR 5/1 gray	NR	21		SPT Sampler	13 12 14	26
							-54.0		
							Advanced Boring		
							-57.5		
			From El. -57.5 to -62.5 Ft., few shell, 10YR 5/1 gray	NR	22		SPT Sampler	14 11 16	27
							-59.0		
							Advanced Boring		
							-62.5		
			From El. -62.5 to -67.5 Ft., trace shell, 10YR 5/1 gray	NR	23		SPT Sampler	12 18 17	35
							-64.0		
							Advanced Boring		
-67.5	93.5						-67.5		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell up to 1/4", 10YR 5/1 gray (SP-SM)	NR	24		SPT Sampler	15 17 21	38
							-69.0		

75 80 85 90 95

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Boring Designation CB-413

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 6 OF 6 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 840,789 Y = 998,117	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-72.5		
			From El. -72.5 to -77.5 Ft., few shell, 10YR 5/1 gray	NR	25		SPT Sampler	11 / 13 / 17	30
							-74.0		
							Advanced Boring		
-77.5	103.5						-77.5		
			SANDSTONE, calcrete, hard, 10YR 5/1 gray	NR	26		-78.0 SPT Sampler	50/4	
							Advanced Boring		
-82.5	108.5						-82.5		
			SAND, silty, some fine to coarse-grained sand-sized shell, 10YR 7/1 light gray (SM)	NR	27		SPT Sampler	8 / 7 / 6	13
-84.0	110.0						-84.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

95 100 105 110 115

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Boring Designation CB-419

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-419
LOCATION COORDINATES	X = 841,382 Y = 1,010,833
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	22.0 Ft.
15. DATE BORING	STARTED 06-14-06 / COMPLETED 06-14-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SILT, organic-L, 10YR 2/1 black (OL)	NR	1		SPT Sampler	1 1 1 1	2
22.0	4.0		SAND, clayey, 10YR 5/2 grayish brown (SC)	NR	2		SPT Sampler	2 2 2 2	4
20.0	6.0		From El. 22.0 to 20.0 Ft., 10YR 5/2 grayish brown	NR	3		SPT Sampler	1 1 2 2	3
18.0	8.0		From El. 20.0 to 18.0 Ft., 10YR 5/1 gray	NR	4		SPT Sampler	5 6 7 9	13
16.0	10.0		From El. 18.0 to 16.0 Ft., 10YR 5/1 gray	NR	5		SPT Sampler	4 5 5 5	10
14.0	12.0		SAND, silty, 10YR 5/1 gray (SM)	NR	6		SPT Sampler	5 5 7 8	12
12.0	14.0		SAND, poorly-graded with silt, few shell, wet, 10YR 5/1 gray (SP-SM)	NR	7		SPT Sampler	2 2 6 8	8
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, wet, 10YR 5/1 gray (SP)	NR	8		SPT Sampler	6 8	

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Boring Designation CB-419

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 2 OF 5 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 841,382 Y = 1,010,833	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler	14 / 20	22
							10.0 Advanced Boring		
			From El. 7.5 to 2.5 Ft., some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray	NR	9		7.5 SPT Sampler	18 / 17 / 20	37
							6.0 Advanced Boring		
			From El. 2.5 to -2.5 Ft., few shell, 10YR 5/1 gray	NR	10		2.5 SPT Sampler	11 / 13 / 20	33
							1.0 Advanced Boring		
			From El. -2.5 to -7.5 Ft., trace shell, wet, 10YR 5/1 gray	NR	11		-2.5 SPT Sampler	12 / 15 / 13	28
							-4.0 Advanced Boring		
-7.5	33.5		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)	NR	12		-7.5 SPT Sampler	12 / 18 / 20	38
							-9.0		

15 20 25 30 35

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-419

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83 / VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,382 Y = 1,010,833	ELEVATION TOP OF BORING: 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
-12.5	38.5						-12.5		
			SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	13		SPT Sampler	13 / 18 / 21	39
							-14.0		
							Advanced Boring		
			From El. -17.5 to -22.5 Ft., trace shell, 10YR 5/1 gray				-17.5		
				NR	14		SPT Sampler	17 / 14 / 23	37
							-19.0		
							Advanced Boring		
-22.5	48.5						-22.5		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler	15 / 13 / 18	31
							-24.0		
							Advanced Boring		
							-27.5		
			From El. -27.5 to -32.5 Ft., trace shell, 10YR 5/1 gray	NR	16		SPT Sampler	9 / 11 / 12	23
							-29.0		

35 40 45 50 55

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-419

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County		SHEET 4 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83	VERTICAL: NAVD88
LOCATION COORDINATES: X = 841,382 Y = 1,010,833	ELEVATION TOP OF BORING: 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-32.5		
			From El. -32.5 to -37.5 Ft., trace shell, wet, 10YR 4/1 dark gray	NR	17		SPT Sampler	8 / 10 / 10	20
							-34.0		
							Advanced Boring		
-37.5	63.5						-37.5		
			SAND, silty, 10YR 5/1 gray (SM)	NR	18		SPT Sampler	3 / 4 / 3	7
							-39.0		
							Advanced Boring		
-42.5	68.5						-42.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	19		SPT Sampler	10 / 9 / 13	22
							-44.0		
							Advanced Boring		
							-47.5		
			From El. -47.5 to -49.0 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	20		SPT Sampler	12 / 8 / 11	19
-49.0	75.0						-49.0		

55 60 65 70 75

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-419

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 841,382 Y = 1,010,833	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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80
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Boring Designation CB-423

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin	SHEET 1 OF 5 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-423
LOCATION COORDINATES	X = 848,204 Y = 982,865
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	75.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 20 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	16.0 Ft.
15. DATE BORING	STARTED 06-20-06 / COMPLETED 06-20-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, poorly-graded with silt, 10YR 6/3 pale brown (SP-SM)	NR	1		SPT Sampler	2, 3, 4, 3	7
24.0	2.0						24.0		
			SAND, clayey, trace root, 10YR 5/1 gray (SC)	NR	2		SPT Sampler	3, 5, 8, 9	13
			From El. 22.0 to 20.0 Ft., 10YR 5/1 gray	NR	3		SPT Sampler	7, 11, 10, 8	21
			From El. 20.0 to 18.0 Ft., 10YR 5/1 gray	NR	4		SPT Sampler	7, 9, 13, 16	22
			From El. 18.0 to 16.0 Ft., few limestone up to 1/8", N 6/ gray	NR	5		SPT Sampler	9, 9, 10, 10	19
16.0	10.0						16.0		
			SAND, poorly-graded with silt, some fine-grained sand-sized shell, 10YR 6/3 pale brown (SP-SM)	NR	6		SPT Sampler	14, 36, 37	73
							14.5		
							14.0 Advanced Boring		
			From El. 14.0 to 12.0 Ft., some fine-grained sand-sized shell, 10YR 6/3 pale brown	NR	7		SPT Sampler	21, 30, 33	63
							12.5		
							12.0 Advanced Boring		
			From El. 12.0 to 7.5 Ft., some fine-grained sand-sized shell, wet, 10YR 6/3 pale brown	NR	8		SPT Sampler	20, 23	

0 5 10 15

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Database/Template Checked
Geology/Nomenclature Checked
Initial Data Entry Checked

(Continued)

Boring Designation CB-423

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin	SHEET 2 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83 / VERTICAL NAVD88
LOCATION COORDINATES X = 848,204 Y = 982,865	ELEVATION TOP OF BORING 26.0 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		10.5 SPT Sampler	27	50
							Advanced Boring		
7.5	18.5						7.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, moist, 10YR 5/1 gray (SP)	NR	9		SPT Sampler	16 18 20	38
							6.0		
							Advanced Boring		
			From El. 2.5 to -2.5 Ft., few shell, 10YR 5/1 gray				2.5		
				NR	10		SPT Sampler	14 17 21	38
							1.0		
							Advanced Boring		
			From El. -2.5 to -7.5 Ft., few shell, 10YR 5/1 gray				-2.5		
				NR	11		SPT Sampler	12 15 19	34
							-4.0		
							Advanced Boring		
			From El. -7.5 to -12.5 Ft., 10YR 5/1 gray				-7.5		
				NR	12		SPT Sampler	11 19 20	39
							-9.0		

15 20 25 30 35

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation CB-423

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin		SHEET 3 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83	VERTICAL: NAVD88
LOCATION COORDINATES: X = 848,204 Y = 982,865	ELEVATION TOP OF BORING: 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., trace shell, 10YR 5/1 gray	NR	13		SPT Sampler	10 / 14 / 20	34
							-14.0		
							Advanced Boring		
							-17.5		
			From El. -17.5 to -22.5 Ft., trace shell, 10YR 5/1 gray	NR	14		SPT Sampler	11 / 18 / 21	39
							-19.0		
							Advanced Boring		
-22.5	48.5						-22.5		
			SAND, poorly-graded with silt, few shell, 10YR 5/1 gray (SP-SM)	NR	15		SPT Sampler	9 / 12 / 16	28
							-24.0		
							Advanced Boring		
							-27.5		
			From El. -27.5 to -32.5 Ft., trace shell, 10YR 5/1 gray	NR	16		SPT Sampler	11 / 13 / 12	25
							-29.0		

35 40 45 50 55

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-423

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin		SHEET 4 OF 5 SHEETS
PROJECT: C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.)	HORIZONTAL: NAD 83	VERTICAL: NAVD88
LOCATION COORDINATES: X = 848,204 Y = 982,865	ELEVATION TOP OF BORING: 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
-32.5	58.5						-32.5		
			SAND, silty, few shell, 10YR 4/1 dark gray (SM)	NR	17		SPT Sampler	9 / 9 / 10	19
							-34.0		
							Advanced Boring		
			From El. -37.5 to -42.5 Ft., few shell, 5GY 4/1 dark greenish gray				-37.5		
				NR	18		SPT Sampler	5 / 7 / 11	18
							-39.0		
							Advanced Boring		
-42.5	68.5						-42.5		
			SAND, poorly-graded with silt, few shell, 10YR 5/1 gray (SP-SM)	NR	19		SPT Sampler	11 / 11 / 14	25
							-44.0		
							Advanced Boring		
			From El. -47.5 to -49.0 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray				-47.5		
				NR	20		SPT Sampler	10 / 12 / 15	27
-49.0	75.0						-49.0		

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Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

Boring Designation CB-423

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin		SHEET 5 OF 5 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 848,204 Y = 982,865	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). Abbreviations: NR = Not Recorded.		

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation CB-424

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martim	SHEET 1 OF 6 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	CB-424
LOCATION COORDINATES	X = 850,273 Y = 1,012,523
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	110.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-55 (land-based)
	☒ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 27 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	9.0 Ft.
15. DATE BORING	STARTED 06-21-06 / COMPLETED 06-21-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
24.0	2.0		SAND, poorly-graded with silt, 10YR 6/3 pale brown (SP-SM)	NR	1		SPT Sampler	5 5 4 4	9
22.0	4.0		SAND, silty, 10YR 6/3 pale brown (SM)	NR	2		SPT Sampler	4 4 5 4	9
			From El. 22.0 to 20.0 Ft., 10YR 5/2 grayish brown	NR	3		SPT Sampler	1 1 1 1	2
18.0	8.0		From El. 20.0 to 18.0 Ft., 10YR 5/1 gray	NR	4		SPT Sampler	2 2 2 2	4
16.0	10.0		SAND, clayey, 10YR 5/1 gray (SC)	NR	5		SPT Sampler	6 8 9 8	17
14.0	12.0		From El. 16.0 to 14.0 Ft., 10YR 5/1 gray	NR	6		SPT Sampler	6 5 5 7	10
12.0	14.0		From El. 14.0 to 12.0 Ft., 10YR 4/1 dark gray	NR	7		SPT Sampler	4 2 4 3	6
			SAND, silty, 10YR 4/1 dark gray (SM)	NR	8		SPT Sampler	4 3	

DRAFT
☒ Initial Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

(Continued)

Boring Designation CB-424

DRILLING LOG (Cont. Sheet)	INSTALLATION Martim		SHEET 2 OF 6 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 850,273 Y = 1,012,523	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
				NR	8		SPT Sampler 10.0	2 2	5
							Advanced Boring 7.5		
7.5	18.5		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, wet, 10YR 4/1 dark gray (SP-SM)	NR	9		SPT Sampler 6.0	8 12 13	25
							Advanced Boring 2.5		
			From El. 2.5 to -2.5 Ft., few shell, wet, 10YR 4/1 dark gray	NR	10		SPT Sampler 1.0	17 23 32	55
							Advanced Boring -2.5		
			From El. -2.5 to -7.5 Ft., trace shell, 10YR 5/1 gray	NR	11		SPT Sampler -4.0	10 19 16	35
							Advanced Boring -7.5		
-7.5	33.5		SAND, poorly-graded, trace shell, wet, 10YR 5/1 gray (SP)	NR	12		SPT Sampler -9.0	13 11 14	25

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-424

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martim	SHEET 3 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 850,273 Y = 1,012,523	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring -12.5		
			From El. -12.5 to -17.5 Ft., trace shell, 10YR 5/1 gray	NR	13		SPT Sampler -14.0	7 12 14	26
							Advanced Boring -17.5		
			From El. -17.5 to -22.5 Ft., 10YR 5/1 gray	NR	14		SPT Sampler -19.0	9 11 13	24
							Advanced Boring -22.5		
-22.5	48.5		SAND, silty, some fine to coarse-grained sand-sized shell up to 1/4", wet, 5GY 5/1 greenish gray (SM)	NR	15		SPT Sampler -24.0	6 7 7	14
							Advanced Boring -27.5		
			From El. -27.5 to -32.5 Ft., some fine to coarse-grained sand-sized shell up to 1/4", wet, 5GY 5/1 greenish gray	NR	16		SPT Sampler -29.0	8 7 9	16

35 40 45 50 55

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-424

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

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 850,273 Y = 1,012,523	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-32.5	58.5						Advanced Boring -32.5		
-37.5	63.5		SAND, clayey, trace shell, 5GY 5/1 greenish gray (SC)	NR	17		SPT Sampler -34.0	4 6 3	9
							Advanced Boring -37.5		
-42.5	68.5		SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP-SM)	NR	18		SPT Sampler -39.0	13 15 14	29
							Advanced Boring -42.5		
			SAND, poorly-graded, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP)	NR	19		SPT Sampler -44.0	14 22 22	44
							Advanced Boring -47.5		
			From El. -47.5 to -52.5 Ft., some fine to coarse-grained sand-sized shell, 10YR 5/1 gray	NR	20		SPT Sampler -49.0	16 16 19	35

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-424

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martim	SHEET 5 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 850,273 Y = 1,012,523	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-52.5	78.5						Advanced Boring -52.5		
			SAND, silty, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SM)	NR	21		SPT Sampler -54.0	6 9 11	20
							Advanced Boring -57.5		
			From El. -57.5 to -62.5 Ft., some shell, 10YR 5/1 gray	NR	22		SPT Sampler -59.0	10 9 7	16
-62.5	88.5						Advanced Boring -62.5		
			SAND, poorly-graded with silt, some shell, 10YR 5/1 gray (SP-SM)	NR	23		SPT Sampler -64.0	7 10 10	20
-67.5	93.5						Advanced Boring -67.5		
			SAND, silty, few shell, 10YR 7/1 light gray (SM)	NR	24		SPT Sampler -69.0	10 13 9	22

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Geology/Nomenclature Checked
Initial/Data Entry Checked

Boring Designation CB-424

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martim	SHEET 6 OF 6 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 850,273 Y = 1,012,523	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-72.5		
			From El. -72.5 to -77.5 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 7/1 light gray	NR	25		SPT Sampler	8 / 9 / 8	17
							-74.0		
							Advanced Boring		
							-77.5		
			From El. -77.5 to -82.5 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 7/1 light gray	NR	26		SPT Sampler	6 / 7 / 9	16
							-79.0		
							Advanced Boring		
							-82.5		
			From El. -82.5 to -84.0 Ft., some fine to coarse-grained sand-sized shell, wet, 10YR 7/1 light gray	NR	27		SPT Sampler	7 / 8 / 7	15
-84.0	110.0						-84.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

95 100 105 110 115

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Auger Boring Logs

Boring Designation AB-408

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-408
LOCATION COORDINATES	X = 847,427 Y = 1,011,210
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 12 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	22.5 Ft.
15. DATE BORING	STARTED 06-08-06 / COMPLETED 06-08-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
25.0	1.0		SAND, poorly-graded, 10YR 5/1 gray (SP)		1		Hand Auger 25.0		
24.0	2.0		SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM)		2		Hand Auger 24.0		
23.0	3.0		SAND, poorly-graded, 10YR 6/4 light yellowish brown (SP)		3		Hand Auger 23.0		
			SAND, silty, 10YR 6/4 light yellowish brown (SM)		4		Hand Auger 22.0		
			From El. 22.0 to 21.0 Ft., 10YR 4/6 dark yellowish brown		5		Hand Auger 21.0		
20.0	6.0		From El. 21.0 to 20.0 Ft., 10YR 5/2 grayish brown		6		Hand Auger 20.0		
			SAND, clayey, 10YR 5/2 grayish brown (SC)		7		Hand Auger 19.0		
			From El. 19.0 to 18.0 Ft., 10YR 6/2 light brownish gray		8		Hand Auger 18.0		
			From El. 18.0 to 17.0 Ft., 10YR 6/2 light brownish gray		9		Hand Auger 17.0		
			From El. 17.0 to 16.0 Ft., 5G 6/1 greenish gray		10		Hand Auger 16.0		
15.0	11.0		From El. 16.0 to 15.0 Ft., 5G 6/1 greenish gray		11		Hand Auger 15.0		
11.0	15.0		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)		12		Hand Auger 11.0		

DRAFT
☒ Geology/Nomenclature Checked
☒ Initial Data Entry Checked
☒ Database/Template Checked

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Boring Designation AB-408

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 847,427 Y = 1,011,210	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

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Boring Designation AB-409

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-409
LOCATION COORDINATES	X = 847,584 Y = 1,008,819
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 12 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	23.0 Ft.
15. DATE BORING	STARTED: 06-08-06 COMPLETED: 06-08-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
25.0	1.0		SAND, poorly-graded with silt, 10YR 3/1 very dark gray (SP-SM)		1		Hand Auger 25.0		
24.0			SAND, silty, 10YR 3/1 very dark gray (SM)		2		Hand Auger 24.0		
23.0			From El. 24.0 to 23.0 Ft., 10YR 3/1 very dark gray		3		Hand Auger 23.0		
22.0	4.0		From El. 23.0 to 22.0 Ft., 10YR 3/2 very dark grayish brown		4		Hand Auger 22.0		
21.0			SAND, clayey, 10YR 3/1 very dark gray (SC)		5		Hand Auger 21.0		
20.0			From El. 21.0 to 20.0 Ft., 10YR 3/1 very dark gray		6		Hand Auger 20.0		
19.0			From El. 20.0 to 19.0 Ft., 10YR 3/1 very dark gray		7		Hand Auger 19.0		
18.0			From El. 19.0 to 18.0 Ft., 10YR 3/1 very dark gray		8		Hand Auger 18.0		
17.0			From El. 18.0 to 17.0 Ft., moist, 10YR 5/1 gray		9		Hand Auger 17.0		
16.0			From El. 17.0 to 16.0 Ft., moist, 10YR 7/1 light gray		10		Hand Auger 16.0		
15.0	11.0		From El. 16.0 to 15.0 Ft., 10YR 7/1 light gray		11		Hand Auger 15.0		
11.0	15.0		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)		12		Hand Auger 11.0		

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☒ Initial Data Entry Checked
☒ Geology Nomenclature Checked
☐ Database/Template Checked

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Boring Designation AB-409

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 847,584 Y = 1,008,819	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation AB-410

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-410
LOCATION COORDINATES	X = 847,487 Y = 1,007,479
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 12 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED: 06-13-06 COMPLETED: 06-13-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 3/4 dark yellowish brown (SM)		1		Hand Auger 25.0		
			From El. 25.0 to 24.0 Ft., 10YR 5/2 grayish brown		2		Hand Auger 24.0		
			From El. 24.0 to 23.0 Ft., 10YR 5/1 gray		3		Hand Auger 23.0		
23.0	3.0								
			SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)		4		Hand Auger 22.0		
22.0	4.0								
			SAND, poorly-graded, 10YR 5/1 gray (SP) ▼		5		Hand Auger 21.0		
21.0	5.0								
			SAND, silty, 10YR 4/1 dark gray (SM)		6		Hand Auger 20.0		
			From El. 20.0 to 19.0 Ft., trace clay, 10YR 2/2 very dark brown		7		Hand Auger 19.0		
19.0	7.0								
			SAND, clayey, 10YR 2/2 very dark brown (SC)		8		Hand Auger 18.0		
			From El. 18.0 to 17.0 Ft., 10YR 2/2 very dark brown		9		Hand Auger 17.0		
			From El. 17.0 to 16.0 Ft., 10YR 2/2 very dark brown		10		Hand Auger 16.0		
			From El. 16.0 to 15.0 Ft., 10YR 4/1 dark gray		11		Hand Auger 15.0		
			From El. 15.0 to 14.0 Ft., 10YR 5/3 brown						
14.0	12.0								
			SAND, poorly-graded with silt, 10YR 6/2 light brownish gray (SP-SM)		12		Hand Auger 11.0		
11.0	15.0								

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Geology/Nomenclature Checked
Database/Template Checked
Initial Data Entry Checked

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Boring Designation AB-410

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 847,487 Y = 1,007,479	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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☒ Initial/Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

Boring Designation AB-414

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-414
LOCATION COORDINATES	X = 842,124 Y = 1,011,199
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 12 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 06-15-06 / COMPLETED 06-15-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
25.0	1.0		SAND, poorly-graded with silt, 10YR 5/3 brown (SP-SM)		1		Hand Auger 25.0		
			SAND, silty, 10YR 3/3 dark brown (SM)		2		Hand Auger 24.0		
			From El. 24.0 to 23.0 Ft., 10YR 2/2 very dark brown		3		Hand Auger 23.0		
			From El. 23.0 to 22.0 Ft., 10YR 3/3 dark brown		4		Hand Auger 22.0		
21.0	5.0		SAND, poorly-graded with silt, 10YR 5/2 grayish brown (SP-SM) ▼		5		Hand Auger 21.0		
			SAND, clayey, 10YR 3/2 very dark grayish brown (SC)		6		Hand Auger 20.0		
			From El. 20.0 to 19.0 Ft., 10YR 3/2 very dark grayish brown		7		Hand Auger 19.0		
			From El. 19.0 to 18.0 Ft., 10YR 5/2 grayish brown		8		Hand Auger 18.0		
			From El. 18.0 to 17.0 Ft., 10YR 6/2 light brownish gray		9		Hand Auger 17.0		
			From El. 17.0 to 16.0 Ft., 10YR 6/2 light brownish gray		10		Hand Auger 16.0		
			From El. 16.0 to 15.0 Ft., 10YR 5/1 gray		11		Hand Auger 15.0		
			From El. 15.0 to 14.0 Ft., 10YR 5/1 gray		12		Hand Auger 14.0		
14.0	12.0		SAND, poorly-graded with silt (SP-SM)				Hand Auger 11.0		
11.0	15.0								

DRAFT
☒ Initial Data Entry Checked
☒ Geology Nomenclature Checked
☐ Database/Template Checked

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Boring Designation AB-414

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 842,124 Y = 1,011,199	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation AB-415

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-415
LOCATION COORDINATES	X = 842,262 Y = 1,007,292
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 12 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 06-13-06 / COMPLETED 06-13-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
25.0	1.0		SAND, poorly-graded, trace root, 10YR 5/1 gray (SP)		1		Hand Auger 25.0		
23.0	3.0		SAND, poorly-graded with silt, 10YR 4/1 dark gray (SP-SM) From El. 24.0 to 23.0 Ft., 10YR 4/1 dark gray		2 3		Hand Auger 24.0 Hand Auger 23.0		
22.0	4.0		SAND, poorly-graded, 10YR 5/1 gray (SP)		4		Hand Auger 22.0		
21.0	5.0		SAND, silty, 10YR 2/2 very dark brown (SM)		5		Hand Auger 21.0		
			SAND, clayey, 10YR 2/2 very dark brown (SC) From El. 20.0 to 19.0 Ft., 10YR 4/1 dark gray From El. 19.0 to 18.0 Ft., 10YR 4/1 dark gray From El. 18.0 to 17.0 Ft., 10YR 4/1 dark gray From El. 17.0 to 16.0 Ft., 10YR 4/1 dark gray From El. 16.0 to 15.0 Ft., 10YR 5/1 gray		6 7 8 9 10 11		Hand Auger 20.0 Hand Auger 19.0 Hand Auger 18.0 Hand Auger 17.0 Hand Auger 16.0 Hand Auger 15.0		
11.0	15.0		SAND, poorly-graded with silt, 10YR 5/1 gray (SP-SM)		12		Hand Auger 11.0		

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☒ Geology/Nomenclature Checked
☒ Initial Data Entry Checked
☐ Database/Template Checked

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Boring Designation AB-415

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 842,262 Y = 1,007,292	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation AB-416

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-416
LOCATION COORDINATES	X = 845,818 Y = 1,007,307
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 06-13-06 / COMPLETED 06-13-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 3/2 very dark grayish brown (SM)		1		Hand Auger 25.0		
			From El. 25.0 to 24.0 Ft., 10YR 3/2 very dark grayish brown		2		Hand Auger 24.0		
24.0	2.0								
			SAND, poorly-graded with silt, 10YR 4/2 dark grayish brown (SP-SM)		3		Hand Auger 23.0		
23.0	3.0								
			SAND, poorly-graded with clay, 10YR 3/2 very dark grayish brown (SP-SC)		4		Hand Auger 22.0		
22.0	4.0								
			SAND, clayey, 10YR 3/2 very dark grayish brown (SC)		5		Hand Auger 21.0		
			From El. 21.0 to 20.0 Ft., 10YR 4/1 dark gray		6		Hand Auger 20.0		
			From El. 20.0 to 19.0 Ft., 10YR 5/1 gray		7		Hand Auger 19.0		
			From El. 19.0 to 18.0 Ft., 10YR 5/1 gray		8		Hand Auger 18.0		
			From El. 18.0 to 17.0 Ft., 10YR 5/1 gray		9		Hand Auger 17.0		
			From El. 17.0 to 16.0 Ft., soft, few shell, 10YR 5/1 gray		10		Hand Auger 16.0		
			From El. 16.0 to 15.0 Ft., 10YR 7/1 light gray		11		Hand Auger 11.0		
11.0	15.0								

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Database/Template Checked
Geology/Nomenclature Checked
Initial Data Entry Checked

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Boring Designation AB-416

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 845,818 Y = 1,007,307	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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☒ Initial/Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

Boring Designation AB-417

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-417
LOCATION COORDINATES	X = 845,619 Y = 1,009,980
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 12 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	22.0 Ft.
15. DATE BORING	STARTED 06-13-06 / COMPLETED 06-13-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 4/1 dark gray (SM)		1		Hand Auger 25.0		
			From El. 25.0 to 24.0 Ft., 10YR 2/1 black		2		Hand Auger 24.0		
			From El. 24.0 to 23.0 Ft., 10YR 4/1 dark gray		3		Hand Auger 23.0		
			From El. 23.0 to 22.0 Ft., trace clay, 10YR 4/1 dark gray		4		Hand Auger 22.0		
22.0	4.0		SAND, clayey, 10YR 5/2 grayish brown (SC)		5		Hand Auger 21.0		
			From El. 21.0 to 20.0 Ft., 10YR 4/2 dark grayish brown		6		Hand Auger 20.0		
			From El. 20.0 to 19.0 Ft., 10YR 4/2 dark grayish brown		7		Hand Auger 19.0		
			From El. 19.0 to 18.0 Ft., 10YR 5/1 gray		8		Hand Auger 18.0		
			From El. 18.0 to 17.0 Ft., 10YR 5/1 gray		9		Hand Auger 17.0		
			From El. 17.0 to 16.0 Ft., 5BG 6/1 greenish gray		10		Hand Auger 16.0		
			From El. 16.0 to 15.0 Ft., 10YR 7/1 light gray		11		Hand Auger 14.0		
14.0	12.0		SAND, poorly-graded with silt, soft, wet, 10YR 5/1 gray (SP-SM)		12		Hand Auger 11.0		
11.0	15.0								

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Geology/Nomenclature Checked
Database/Template Checked
Initial Data Entry Checked

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Boring Designation AB-417

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 845,619 Y = 1,009,980	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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☒ Initial/Data Entry Checked
☒ Geology/Nomenclature Checked
☐ Database/Template Checked

Boring Designation AB-418

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 2 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	AB-418
LOCATION COORDINATES	X = 842,305 Y = 1,009,086
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	15.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 12 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	16.0 Ft.
15. DATE BORING	STARTED 06-14-06 / COMPLETED 06-14-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
26.0	0.0						26.0		
25.0	1.0		SAND, poorly-graded with silt, 10YR 4/2 dark grayish brown (SP-SM)		1		Hand Auger 25.0		
			SAND, clayey, 10YR 4/2 dark grayish brown (SC)		2		Hand Auger 24.0		
					3		Hand Auger 23.0		
			From El. 23.0 to 21.0 Ft., 10YR 4/1 dark gray		4		Hand Auger 22.0		
					5		Hand Auger 21.0		
			From El. 21.0 to 20.0 Ft., 10YR 5/2 grayish brown		6		Hand Auger 20.0		
			From El. 20.0 to 18.0 Ft., 10YR 5/2 grayish brown		7		Hand Auger 19.0		
					8		Hand Auger 18.0		
			From El. 18.0 to 16.0 Ft., soft, 10YR 5/1 gray		9		Hand Auger 17.0		
16.0	10.0				10		Hand Auger 16.0		
			SAND, silty, 10YR 5/1 gray (SM)		11		Hand Auger 14.0		
11.0	15.0				12		Hand Auger 11.0		

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Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked

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Boring Designation AB-418

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County			SHEET 2 OF 2 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88	
LOCATION COORDINATES X = 842,305 Y = 1,009,086	ELEVATION TOP OF BORING 26.0 Ft.			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Geologist not present during sampling of borehole.						

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Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Monitoring Well Boring Logs

Boring Designation MW-406

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Martin County	SHEET 1 OF 3 SHEETS

1. PROJECT	C-44 Reservoir/STA Project
2. BORING DESIGNATION	MW-406
LOCATION COORDINATES	X = 848,551 Y = 1,012,523
3. DRILLING AGENCY	Williams
CONTRACTOR FILE NO.	06-026B
4. NAME OF DRILLER	J. Derubeis
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	50.0 Ft.
9. SIZE AND TYPE OF BIT	
10. COORDINATE SYSTEM/DATUM	State Plane, FLE (U.S. Ft.)
HORIZONTAL	NAD 83
VERTICAL	NAVD88
11. MANUFACTURER'S DESIGNATION OF DRILL	CME-45 (land-based)
☒ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	DISTURBED 11 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	21.0 Ft.
15. DATE BORING	STARTED 06-07-06 / COMPLETED 06-07-06
16. ELEVATION TOP OF BORING	26.0 Ft.
17. TOTAL RECOVERY FOR BORING	Not Recorded
18. SIGNATURE AND TITLE OF INSPECTOR	,

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
26.0	0.0						26.0		
			SAND, silty, 10YR 5/1 gray (SM)	NR	1		SPT Sampler	2 4 2	6
							24.5 Advanced Boring		
22.5	3.5						22.5		
			SAND, poorly-graded with silt, trace clay, 10YR 6/3 pale brown (SP-SM)	NR	2		SPT Sampler	2 2 4	6
							21.0 Advanced Boring		
17.5	8.5						17.5		
			SAND, silty, few sandstone up to 1/8, 5GY 6/1 greenish gray (SM)	NR	3		SPT Sampler	7 12 11	23
							16.0 Advanced Boring		
12.5	13.5						12.5		
			SAND, clayey, soft, few sandstone up to 1/8, few shell, 5GY 5/1 greenish gray (SC)	NR	4		SPT Sampler	2 1 2	3
							11.0		

DRAFT
Geology/Nomenclature Checked
Database/Template Checked
Initial/Data Entry Checked

(Continued)

Boring Designation MW-406

DRILLING LOG (Cont. Sheet)	INSTALLATION Martin County		SHEET 2 OF 3 SHEETS
PROJECT C-44 Reservoir/STA Project	COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD 83	VERTICAL NAVD88
LOCATION COORDINATES X = 848,551 Y = 1,012,523	ELEVATION TOP OF BORING 26.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
7.5	18.5						Advanced Boring 7.5		
			SAND, silty, soft, few shell, percent fines = 14.2%, 5GY 5/1 greenish gray (SM)	NR	5		SPT Sampler 6.0	3 2 2	4
2.5	23.5						Advanced Boring 2.5		
			SAND, poorly-graded with silt, some fine to coarse-grained sand-sized shell, 10YR 5/1 gray (SP-SM)	NR	6		SPT Sampler 1.0	14 15 15	30
-2.5	28.5						Advanced Boring -2.5		
			SAND, poorly-graded, few shell, wet, 10YR 5/1 gray (SP)	NR	7		SPT Sampler -4.0	5 11 12	23
							Advanced Boring -7.5		
			From El. -7.5 to -12.5 Ft., 10YR 5/1 gray	NR	8		SPT Sampler -9.0	8 12 13	25

15 20 25 30 35

DRAFT
Initial/Data Entry Checked
Geology/Nomenclature Checked
Database/Template Checked

Boring Designation MW-406

DRILLING LOG (Cont. Sheet)	INSTALLATION: Martin County	SHEET 3 OF 3 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
C-44 Reservoir/STA Project	State Plane, FLE (U.S. Ft.)	NAD 83	NAVD88

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 848,551 Y = 1,012,523	26.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
							Advanced Boring		
							-12.5		
			From El. -12.5 to -17.5 Ft., trace shell, 10YR 5/1 gray	NR	9		SPT Sampler	24 / 26 / 29	55
							-14.0		
							Advanced Boring		
-17.5	43.5						-17.5		
			SAND, silty, moist, 10YR 5/1 gray (SM)	NR	10		SPT Sampler	14 / 22 / 23	45
							-19.0		
							Advanced Boring		
-22.5	48.5						-22.5		
			SAND, poorly-graded with silt, trace shell, 10YR 5/1 gray (SP-SM)	NR	11		SPT Sampler	13 / 15 / 17	32
-24.0	50.0						-24.0		

NOTES:

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

2. Geologist not present during sampling of borehole.

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

Abbreviations:
NR = Not Recorded.

DRAFT
Database/Template Checked
Geology/Nomenclature Checked
Initial/Data Entry Checked