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Dept. Of Environmental Protection
MAR 26 2013
Southwest District

March 25, 2013

Ms. Susan Pelz, P.E.
Florida Department of Environmental Protection
13051 North Telecom Parkway
Temple Terrace, Florida 33637-0926

Subject: Assessment Report for the Pasco Resource Recovery Facility South Stormwater Detention Pond Subsidence Features

Dear Ms. Pelz:

CDM Smith Inc., on behalf of Pasco County, is providing the enclosed report of investigation of the subsidence feature that occurred in the immediate vicinity of the south detention pond at the above-referenced facility. Two hard copies of the report and a compact disc with a PDF version of the report are transmitted with this letter.

The results of the investigation confirmed that the subsidence features formed during or immediately after Tropical Storm Debby as a result of the heavy rainfall and resulting hydraulic loading in the pond where limestone is present near the land surface. The results of the investigation also indicated that the subsidence is very localized, does not pose a threat to the adjacent landfill cells or to the north detention pond, and that there is no increased threat of additional subsidence or contamination of groundwater associated with the subsidence event. Therefore, no further investigation, remediation or other measures to mitigate or monitor further subsidence are recommended.

Please let me know if you have any questions or require additional information.

Sincerely,

William T. Beeson

William T. Beeson, P.G.
CDM Smith Inc.

Enclosure

cc: John Power (Pasco County)
Mr. Richard Tedder, P.E. (FDEP Tallahassee)

Pasco County, Florida

Assessment of Subsidence Features
South Stormwater Detention Pond
Resource Recovery Facility

March 2013

Prepared by:

CDM Smith

SDII Global

Pasco County, Florida
Assessment of Subsidence Features
South Stormwater Detention Pond
Resource Recovery Facility
March 2013

CDM
Smith

In accordance with Section 471 and 492 of Florida Statutes, this Report of the Assessment of Subsidence Features in the South Detention Pond at the West Pasco Resource Recovery Facility in Pasco County, Florida has been prepared under the direct supervision of a licensed Professional Geologist and licensed Professional Engineer in the State of Florida.

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Executive Summary

CDM Smith Inc. (CDM Smith) was retained by Pasco County Utilities (the County or Pasco County) to perform assessment investigations and prepare remedial action plans for subsidence features that developed at the Pasco County Resource Recovery Facility (PCRRF). The facility is located at 14230 Hays Road in Spring Hill, Pasco County, Florida.

As a result of heavy rain associated with Tropical Storm Debby, subsidence features formed in the south stormwater detention pond east of Ash Cell A-3 at the West Pasco Class I Landfill on June 26, 2012. The Florida Department of Environmental Protection (FDEP) was notified of the occurrence of the depressions and inspected the facility on June 27, 2012. In response to the FDEP request, a temporary fence was installed around the subsidence features and a temporary berm was placed in the detention pond to isolate the subsidence area from the remainder of the detention pond.

The objectives of the assessment are to evaluate the potential for additional subsidence to occur in the south detention pond and to obtain sufficient information to develop plans to remediate the existing subsidence features in the south detention pond and to mitigate potential risks to the landfill. In order to safely perform the investigation, filling of the subsidence features was necessary. Initial filling included placement of Controlled Low Strength Material (CLSM) into eight of the subsidence features that were determined to possibly be open to subsurface conduits. After the CLSM cured, the remaining depression spaces in the subsidence features were filled using common fill and the area was returned to the approximate pre-event grade.

This assessment was performed in accordance with the approved work plan and in a manner consistent with the protocols established by the FDEP Landfill Sinkhole Technical Advisory Group. The assessment included the following five tasks:

- Task 1 – Establishment of the site grid and coordinate system,
- Task 2 – Electromagnetic (EM-31) survey (over 21,000 linear feet),
- Task 3 – Geotechnical/geological control borings (45 borings averaging 45 feet deep),
- Task 4 – Ground penetrating radar (GPR) survey (over 48,000 linear feet), and,
- Task 5 – Geotechnical/geological investigations of existing subsidence features.

The objective of the geophysical (EM-31 and GPR) surveys was to identify anomalous subsurface conditions (anomalies) that appear consistent with potential subsidence features. The geophysical anomalies provided guidance in targeting locations for subsurface exploration and testing in the most probable areas for sinkhole development, as well as providing better insight into the geological conditions at the site. The EM-31 survey indicated that there was substantial variation in the electrical conductivity of the shallow sediments at the site. Both low and high conductivity areas were tested with SPT borings in order to evaluate and confirm the causes for the variations in terrain conductivity.

The anomalies identified in the GPR survey included areas where there were interrupted signal reflectors, areas of increased penetration of the radar waves, and areas where reflectors dipped toward a central location were observed. The anomalies most likely to reflect sinkhole development were tested by SPT borings.

Data from SPT borings were used to verify the geophysical data from the GPR and EM surveys and characterizing geological conditions. The data from SPT borings were used to characterize the karst and sinkhole conditions. The SPT data indicate that both sinkhole development and sinkhole activity (as defined in the Florida Statutes) or the potential for future subsidence exists within a focused area of the south detention pond area (The Subsidence Event Area). Sinkhole activity was identified through the presence of weakening of sediments with depth, which is indicative of raveling in the southern part of the south detention pond in the vicinity of the Subsidence Event Area.

The larger sinkholes that developed in the Subsidence Event Area are clearly cover-collapse sinkholes formed by hydraulic loading in the stormwater pond during Tropical Storm Debby. The origin of the larger sinkholes in the Subsidence Event Area occurred in a shallow rock layer with apparent limited areal extent. The smaller, satellite sinkholes peripheral to the cover-collapse sinkholes are small suffosion sinks where sand raveled into pipes that lead to the main conduit of the cover-collapse sinks. Such satellite sinkholes are common around larger, cover collapse features. These filled features are unlikely to re-form as the CLSM and fill material has replaced the failed cover and filled any remaining open void space.

Based on the data collected, it does not appear that the raveling conditions associated with the formation of the sinkhole features in the Subsidence Event Area extend to the west, toward the landfill. Although sinkhole activity, or the potential for subsidence feature development, was also identified in the northeastern corner of the southern detention pond, this area poses no risk to the landfill cells or to the northern detention pond.

Neither additional investigation of the area nor remedial or preventative measures are warranted to mitigate potential future subsidence and/or adverse impacts to the landfill cells. However, securing the area around the event area is recommended to mitigate the potential for injury in the unlikely event of additional subsidence. If the areas continue to subside, additional fill should be placed in the depressions to prevent ponding of rain water.

Section 1

Introduction

1.1 Authorization

CDM Smith Inc. (CDM Smith) was retained by Pasco County Utilities (the County or Pasco County) to perform assessment investigations and prepare remedial action plans for subsidence features that developed at the Pasco County Resource Recovery Facility (PCRRF). The facility is located at 14230 Hays Road in Spring Hill, Pasco County, Florida.

As a result of heavy rain associated with Tropical Storm Debby, subsidence features formed in the south stormwater detention pond east of Ash Cell A-3 at the West Pasco Class I Landfill on June 26, 2012. The Florida Department of Environmental Protection (FDEP) was notified of the occurrence of the depressions and inspected the facility on June 27, 2012. Representatives of Pasco County and CDM Smith met with FDEP on June 27, 2012. In addition to requiring Pasco County to take immediate actions to mitigate the potential for future subsidence, FDEP requested that Pasco County develop a work plan for geological, geotechnical and geophysical investigations of the stormwater detention ponds. This assessment was performed in accordance with the approved work plan and this report is being submitted in accordance with the FDEP request. In addition, the investigation was performed in a manner consistent with the protocols established by the FDEP Landfill Sinkhole Technical Advisory Group.

1.2 Objectives of Assessment

The objectives of the assessment are to evaluate the potential for additional subsidence to occur in the south detention pond and to obtain sufficient information to develop plans to remediate the existing subsidence features in the south detention pond and to mitigate potential risks to the landfill. The assessment was performed in general accordance with a work plan dated October 19, 2012 and approved by FDEP on October 31, 2012, after clarifications regarding the plan were submitted to FDEP (**Appendix A**).

1.3 Organization of Assessment Report

This assessment report presents and describes the results and methods for the investigation, including interpretations of data. Included are discussions regarding the regional and site-specific geology and hydrogeology, geophysical surveys, and geotechnical investigations. This report is organized as follows:

- Section 1 – Introduction
- Section 2 – Results of Investigation
- Section 3 – Methods of Investigation
- Section 4 – Conclusions and Recommendations
- Section 5 – References

1.4 Background Information

1.4.1 Site Location and Description

The PCRRF is located at 14230 Hays Road. Approximately four miles southeast of Spring Hill, Pasco County, Florida within Sections 25 and 26, Township 24 South, and Range 17 East as shown on the United States Geological Survey (USGS) Fivay Junction Quadrangle 7.5-Minute Series Topographic map (**Figure 1-1**). The south detention pond is located in the eastern part of the facility in Section 25 immediately east of the Ash Cell A-1, A-2 and A-3. The location of the South Detention Pond is shown on **Figure 1-2**.

1.4.2 Physical Setting

There are four physiographic provinces in Pasco County (White, 1970). These provinces are the Coastal Swamps, the Gulf Coastal Lowlands, the Brooksville Ridge, and the Tsala Apopka Plain. The site is located in the northwestern part of the county in the Gulf Coastal Lowlands physiographic province.

The Spring Hill area is located in an area with a generally flat landscape typical of the Gulf Coastal Lowlands. The Gulf Coastal Lowlands lie adjacent to the Gulf of Mexico coastline. Fluctuating sea levels sculpted the lowlands through alternating depositional and erosional cycles. Varying thicknesses of unconsolidated to indurated sand, silt and clay overlie limestone throughout this physiographic region. The terrain is flat to gently undulating. Karst features are common throughout the area. The Gulf Coastal Lowlands range in elevation from sea level to approximately 70 feet above sea level although higher elevations occur in limited areas. Drainage varies from poorly drained in the low-lying areas to well drained in the higher elevations.

1.4.3 Regional Geology and Hydrogeology

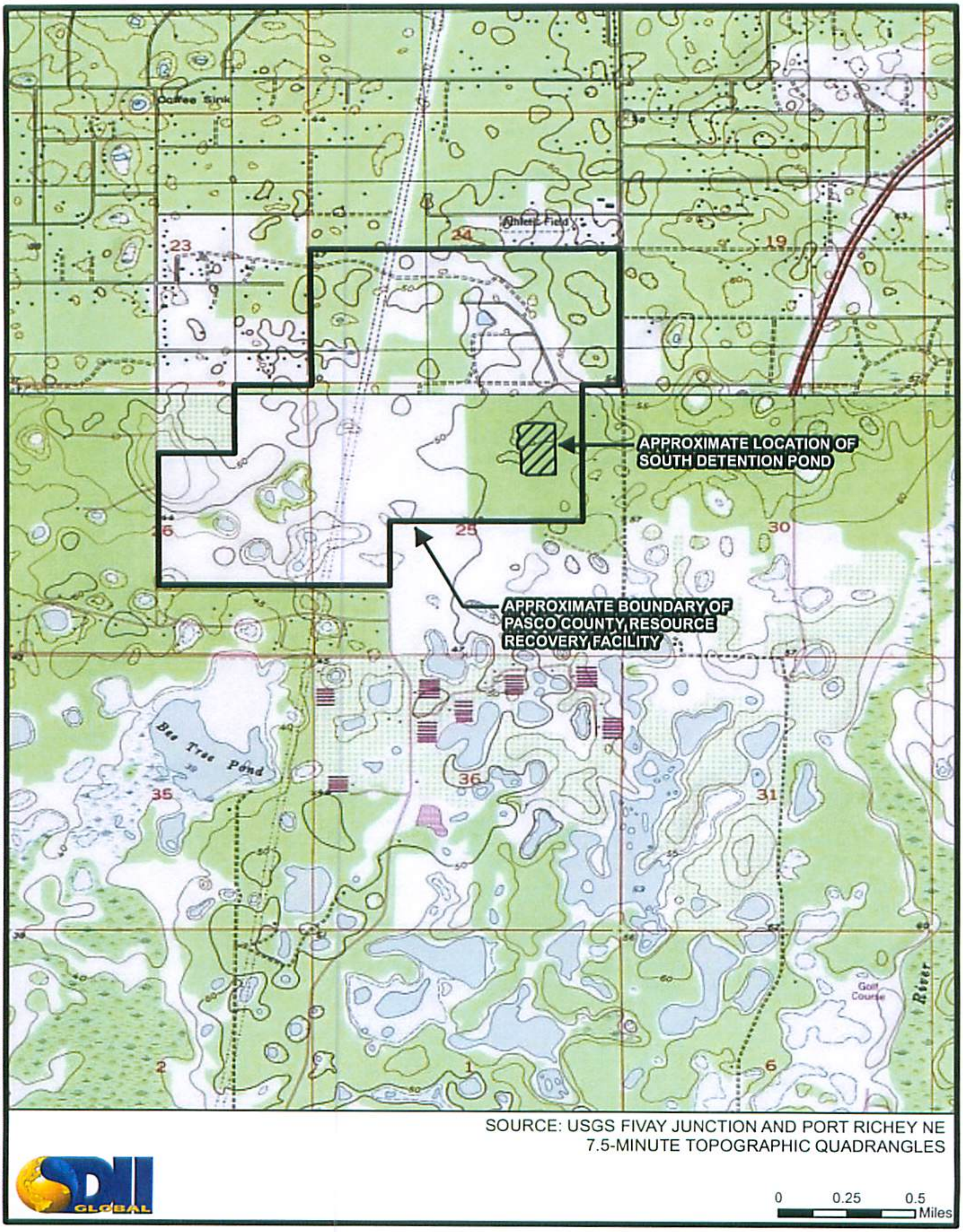
1.4.3.1 Introduction

The regional geology and hydrogeology were evaluated using information contained in the published reports prepared by the Florida Geological Survey (FGS) and the U.S. Geological Survey (USGS). The terminology applied to the regional and local geology and hydrogeology conforms to that given in FGS Special Publication 28 entitled Hydrogeological Units of Florida (Vecchioli et al., 1986) and the Geologic Map of the State of Florida (Scott et al., 2001).

Western Pasco County is an area influenced by geomorphic features, structure, and karst. In general, the area has a veneer of predominantly siliciclastic sediments near surface overlying a section of Cenozoic carbonate sediments. According to Fretwell (1988), there are three primary hydrogeologic units present beneath Pasco County and the Spring Hill area. These units are: 1) the Surficial Aquifer System (SAS), 2) the Intermediate Confining Unit /Intermediate Aquifer System (ICU/IAS), and 3) the Floridan Aquifer System (FAS).

1.4.3.2 Undifferentiated Sediments, the Surficial Aquifer System, and the Intermediate Aquifer System or Intermediate Confining Unit

A series of undifferentiated, predominantly siliciclastic sediments are present from land surface to the top of the underlying Hawthorn Group, if present, or the uppermost carbonate unit of the FAS. These sediments were deposited during the high sea stands and repeatedly eroded and altered by exposure during low sea stands of the Pliocene and/or Pleistocene epochs. Accumulation of wind-blown sand dune deposits and soil formation processes further altered the landscape during the Holocene. This sand mantle ranges in thickness from zero to approximately 100 feet in Pasco County (Fretwell,



APPROXIMATE LOCATION OF SOUTH DETENTION POND

APPROXIMATE BOUNDARY OF PASCO COUNTY RESOURCE RECOVERY FACILITY

SOURCE: USGS FIVAY JUNCTION AND PORT RICHEY NE
7.5-MINUTE TOPOGRAPHIC QUADRANGLES

Figure No. 1-1
Pasco County Resource Recovery Facility
Location Map

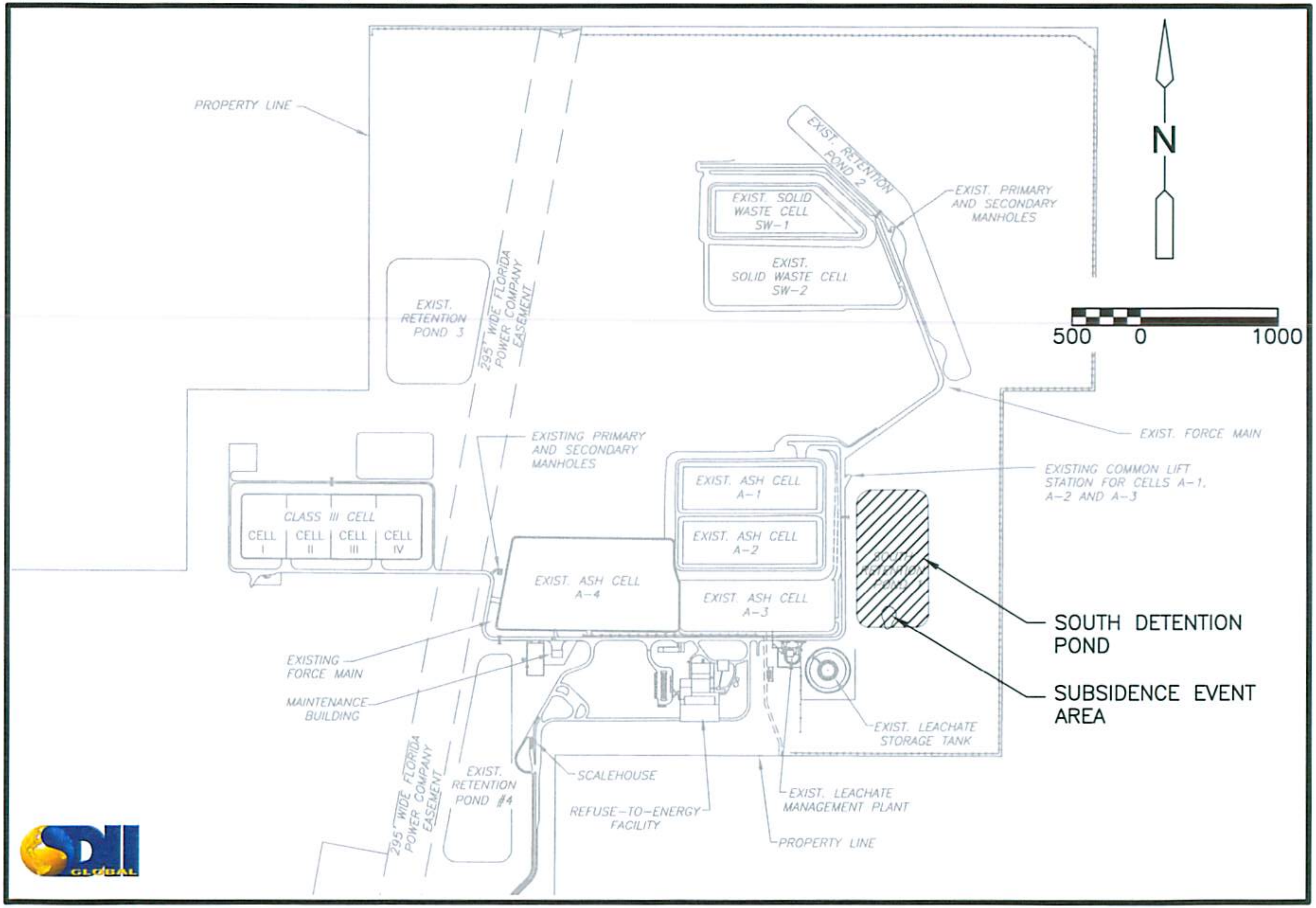


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Figure No. 1-2
Pasco County Resource Recovery Facility
Site Plan Showing Location of South Detention Pond

1988). The unit typically is very heterogeneous with extreme variations in lithology from nearly pure quartz sand to pure clay and admixtures of these and other components, such as organics and phosphate. These sediments comprise the SAS, also termed the surficial aquifer, where there is a sufficient thickness of the deposits and sufficient hydraulic conductivity to define it as an aquifer. In the Spring Hill area, these deposits vary in thickness from being absent to more than 25 feet. In many areas of the region, the sand deposits directly overlie the uppermost carbonate unit of the FAS.

Recharge to the SAS occurs primarily from direct rainfall where the vertical hydraulic conductivity is sufficient to allow infiltration of rainfall. Where clayey soils occur at land surface or where man-made impervious surfaces occur, direct recharge is minimal or non-existent.

The IAS/ICU is defined as all rocks that lie between and collectively retard the exchange of water between the FAS and SAS (Vecchioli, et. al., 1986). In the Spring Hill area, where the Hawthorn Group is only present in remnants or is reworked, the clay layers within the remnants of the Hawthorn Group and in undifferentiated sediments locally function as the ICU and retard exchange of groundwater between the SAS and FAS.

1.4.3.3 Carbonate Units and the Floridan Aquifer System

Carbonate strata of Miocene age and older uncomfortably underlie the ICU where the ICU is present. In ascending order, the freshwater-bearing part of the FAS is the Upper Floridan aquifer, which consists of the Avon Park Formation, Ocala Limestone, Suwannee Limestone, and the Tampa Member of the Hawthorn Group (Arthur et.al. 2008). The uppermost carbonate unit varies locally and may be the Tampa Member of the Hawthorn Group, the Suwannee Limestone, or the Ocala Limestone (Arthur et.al. 2008). In the Spring Hill area, the uppermost carbonate unit of the FAS is the Suwannee Limestone. Also, in the Spring Hill area, the top of the FAS is often at or near land surface. The thickness of the Upper Floridan aquifer in Pasco County ranges from slightly less than 700 feet in the north-central part of the county to about 1,050 feet in the southwestern part of the county (Fretwell, 1988 and Miller, 1986).

Recharge to the FAS occurs by direct entry through sinkholes, by vertical leakage through the confining beds, and by drainage of hydraulically connected beds within the SAS and ICU (Sinclair et al., 1985; Trommer, 1987). The regional direction of groundwater movement in the Upper Floridan aquifer in the Spring Hill area is generally from east to west-northwest (Ortiz, 2007, 2008, 2009 and 2011).

1.4.4 Initial Response Actions

Immediately following the discovery of the subsidence features in the south stormwater detention pond on June 26, 2012, FDEP was notified. FDEP visited the site on June 27, 2012. The site visit included an inspection of the area of the subsidence features, inspection of erosion and temporary repairs to the side slopes of the landfill, and inspection of other surface water detention areas. Eighteen subsidence features were identified by FDEP in the southwestern part of the south detention pond. Global Positioning System (GPS) coordinates were obtained by FDEP using a hand-held GPS instrument. No other subsidence features or evidence of possible additional subsidence was found. Following the site visit, FDEP requested that Pasco County monitor groundwater levels and implement measures to isolate the subsidence features from the detention pond.

In response to the FDEP request, a temporary fence was installed around the subsidence features and a temporary berm was placed in the detention pond to isolate the subsidence area from the remainder of the detention pond. Prior to placement of the temporary berm, a soil boring program was performed along the proposed location of the temporary berm to identify potential locations where additional subsidence might occur. The locations of the subsidence features and the temporary berm are shown on **Figure 1-3**.

The area was inspected by engineers and geologists of the CDM Smith Team and representatives of Pasco County on September 14, 2012. Observations made at the time indicated that the subsidence features occurred in an area where limestone was present near the surface.

In order to safely perform the investigation, filling of the subsidence features was necessary. Prior to filling the subsidence features, the locations were surveyed and the sizes and approximate volumes were measured. Twenty-three subsidence features were mapped and are designated A through W (Figure 1-3). The volumes of the subsidence features varied from 442 cubic yards (A) to less than 0.1 cubic yard (T, U, V, and W).

Brief plans to fill the subsidence features were submitted to the FDEP on September 21, 2012. The initial filling plans included initial placement of Controlled Low Strength Material (CLSM) into eight of the subsidence features that were determined to possibly be open to subsurface conduits. The CLSM consisted of a cement mixture with a compressive strength of approximately 300 pounds per square inch. Subsidence features that received CLSM and the approximate amounts of CSLM installed are identified in **Table 1-1**. After the CLSM was given approximately two days to cure, the remaining depression spaces in the subsidence features were filled using common fill and the area was returned to the approximate pre-event grade.

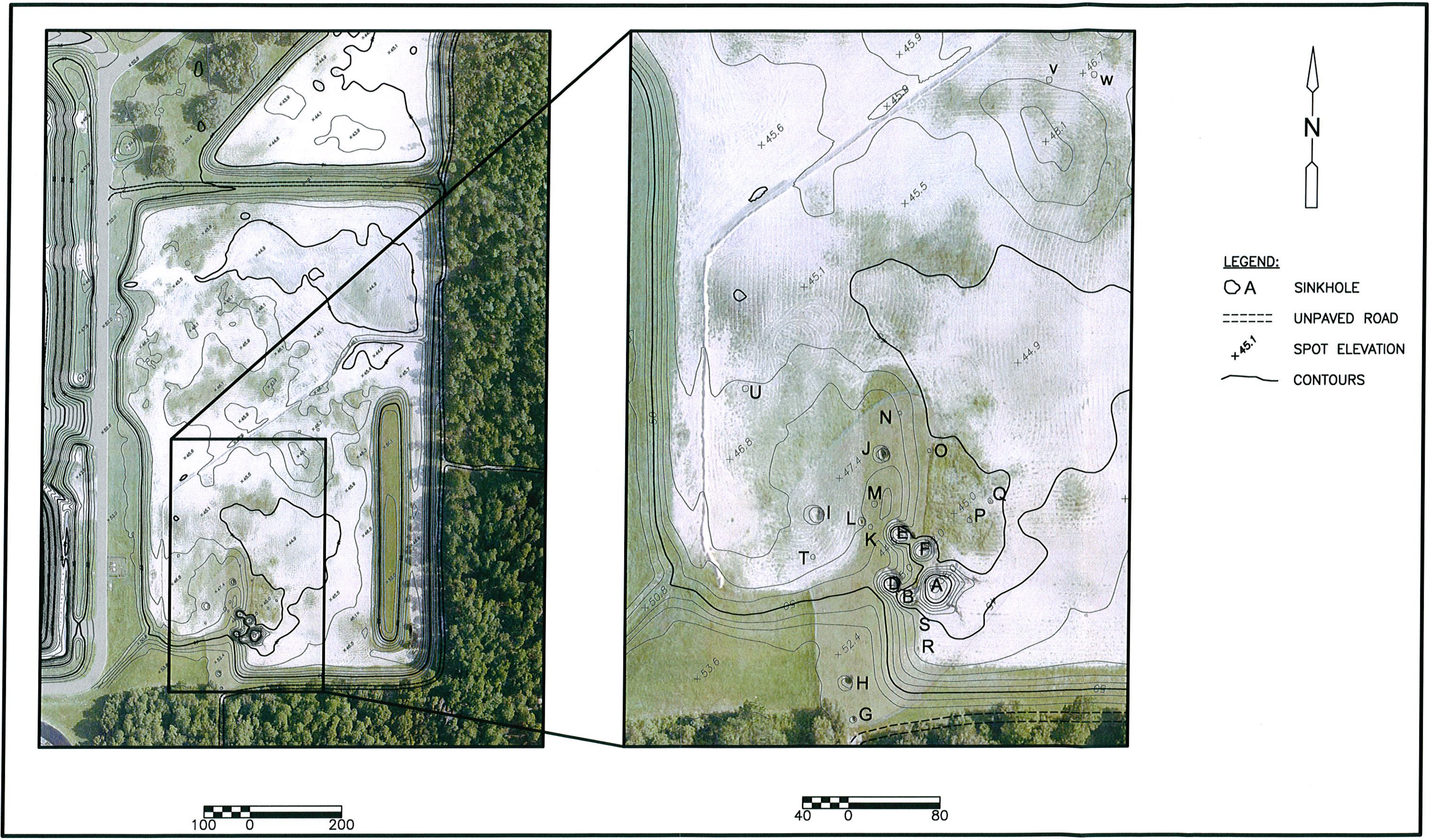

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Figure No.1-3
Pasco County Resource Recovery Facility
Aerial Survey of South Detention Pond and Locations of Subsidence Features

Table 1-1 Summary of Subsidence Feature Information
Pasco County Resource Recovery Facility

Subsidence Feature Designation on Figure 1-3	Amount of CLSM Installed (C.Y.)	Approximate Area of Subsidence Feature (FT^2)	Approximate Maximum Depth of Subsidence Feature (FT)	Approximate Volume of Subsidence Feature (C.Y.)
A	-	1688.0	7.0	257.0
B	-	294.0	2.0	13.6
C	-	36.0	1.0	1.3
D	-	575.0	4.0	52.4
E	-	328.0	2.0	16.1
F	13.4	557.0	4.0	49.0
G	1.9	28.0	1.0	1.0
H	13.6	136.0	1.0	5.0
I	-	238.0	1.0	9.0
J	11.6	180.0	1.0	4.4
K	0.1	480.0	1.0	17.8
L	0.6	53.0	1.0	1.0
M	0.3	1480.0	1.0	31.0
N	-	10.0	0.5	0.1
O	6.0	10.0	0.5	0.1
P	0.3	15.0	0.5	0.2
Q	1.7	15.0	0.5	0.2
R	0.4	23.0	0.5	0.3
S	0.1	6.0	0.5	0.1
T	-	12.0	0.5	0.2
U	-	2.0	0.5	0.0
V	-	8.0	0.5	0.2
W	-	4.5	0.5	0.1

Locations of Subsidence Features Shown on Figure 1-3

CLSM = Controlled Low Strength Material

C.Y. = Cubic Yard or
Yards

FT = Foot or Feet

Section 2

Results of Investigations

2.1 Introduction

Assessment investigations were initiated by the CDM Smith team in November 2012. The specific objectives of the assessment were (1) to evaluate the potential for additional subsidence activity to occur in the south detention pond, (2) to obtain sufficient information to develop plans to remediate the existing subsidence features in the south detention pond, if necessary, and (3) to evaluate and mitigate, if necessary, potential risks to the landfill. The assessment included the following five tasks:

- Task 1 – Establishment of the site grid and coordinate system,
- Task 2 – Electromagnetic (EM-31) survey (over 21,000 linear feet),
- Task 3 – Geotechnical/geological control borings (45 borings averaging 45 feet deep),
- Task 4 – Ground penetrating radar (GPR) survey (over 48,000 linear feet), and,
- Task 5 – Geotechnical/geological investigations of existing subsidence features.

Locations of the EM survey transects, GPR transects are shown on **Figure 2-1** and **Figure 2-2**, respectively. Standard Penetration Test (SPT) boring locations are also shown on Figures 2-1 and 2-2. Results of the investigations including interpretations of the data are discussed in the following sections.

2.2 Geophysical and Geological Investigations

2.2.1 Introduction

The objective of the geophysical (EM-31 and GPR) surveys was to identify anomalous subsurface conditions (anomalies) that appear consistent with potential subsidence features. In doing this, the geophysical anomalies provide guidance for optimizing the geotechnical testing program by providing targeted locations for subsurface testing in the most probable areas for sinkhole development, as well as providing better insight into the geological conditions at the site.

Prior to performing the geophysical surveys, a grid with 50-foot centers was established in and adjacent to the south stormwater detention pond. The grid lines have a true (State Plane) orientation of due North-South and due East-West. All data generated during the geophysical and geotechnical testing was geo-referenced to the site geographic coordinate system.

In accordance with the approved plan, grid nodes were staked every 200 feet around the perimeter of the grid system and at 100-foot intervals along the northern and southern boundaries of the pond at the base of the berm. In the northern part of the pond, nodes were staked at 200-foot intervals from north to south and at 100-foot intervals from east to west. Grid nodes were staked at 100-foot intervals in the southern part of the pond. Each stake was marked with the appropriate site coordinates and elevation. The grid is shown on Figures 2-1 and 2-2.

2.2.2 Results of Geophysical Surveys

Two different geophysical survey technologies were used to identify areas most likely to show signs of sinkhole development and where significant variations in subsurface conditions exist. Anomalous areas were evaluated and utilized to guide locations for SPT borings. The results were also utilized to interpolate geological conditions between SPT borings for construction of the geologic cross-sections and maps depicting thicknesses of different geologic materials presented below. Data from the geophysical surveys are in **Appendix B**.

The EM-31 instrument is used to map average variations of electrical conductivity at depths between zero and 10 to 20 ft. below land surface (bls). As indicated on **Figure 2-3**, the EM-31 survey indicated that there was substantial variation in the electrical conductivity of the shallow sediments at the site. Low conductivity areas, identified by the orange areas on Figure 2-3, reflect lower terrain conductivity attributed to sandy sediments while the blue areas reflect higher conductivity attributed to more clay-rich sediments. As indicated in Figure 2-3, both low and high conductivity areas were tested with SPT borings in order to evaluate and confirm the causes for the variations in terrain conductivity.

GPR uses pulses of electromagnetic energy in the radar range to image changes in the physical properties of shallow sediments. Unlike the ERM-31, GPR data present a vertical section of the distribution of subsurface materials with differing dielectric constants. The anomalies identified in the GPR survey are indicated in **Figure 2-4**. The anomalies included areas where there were interrupted signal reflectors, areas of increased penetration of the radar waves, and areas where reflectors dipped toward a central location were observed. The anomalies most likely to reflect sinkhole development were tested by SPT borings (Figure 2-4).

As demonstrated by the GPR, and by the control and anomaly SPT borings, the site is located within an area of karst development. The general sediment profile at the site consists of sand overlying clay-rich sediments with varying amounts of sand. These sandy and clayey sediments constitute the sediment "cover" package that overlies karstic limestone. Limestone underlies the clayey sediment. Lateral variations in the nature and thicknesses of the geologic strata that comprise the cover are common. For example, depth to limestone (see geologic cross sections **Figures 2-5** through **2-14**) varies from essentially cropping out at the land surface to greater than 80 feet bls. The depth to more clay-rich sediments range from exposure at the land surface to approximately 45 feet bls. Much of this variation is a result of development of the karst at the top and within the limestone.

The uppermost part of the limestone has been subjected to weathering, which has resulted in small pinnacles and depressions in the limestone surface. This weathering has resulted in the mixing of clay-rich sediments with fragments of limestone and localized subsidence feature development. Many of these variations in depth, thickness, and weathering of the strata associated with karst terrain can be discerned using the geophysical data.

The local presence of shallow clayey limestone or clay is reflected by a corresponding local increase in ground electrical conductivity in the EM-31 data set coupled with minimal penetration of radar waves in the GPR profiles. Thick and shallow sands, in comparison, correlate with decreased electrical conductivity and significant increases in the associated depth of GPR penetration. Therefore, the variations in terrain conductivity shown in Figure 2-3 reflect the variations in depth to clay and/or limestone. Conductivity varies over short distances at the site. The GPR data cannot be used to identify many of these small-scale, horizontal spatial variations, but it is excellent for identification the spatial distribution of vertical structures. GPR anomalies identified on Figure 2-4 are dominated by vertical, pw:\\dacpwapp1:PW_XM1\Documents\C104\93934\03 Reports and Studies\11 Draft and Final Reports\CDM Smith Draft\Figures\01 cadd figures\FIG 2-1.dwg

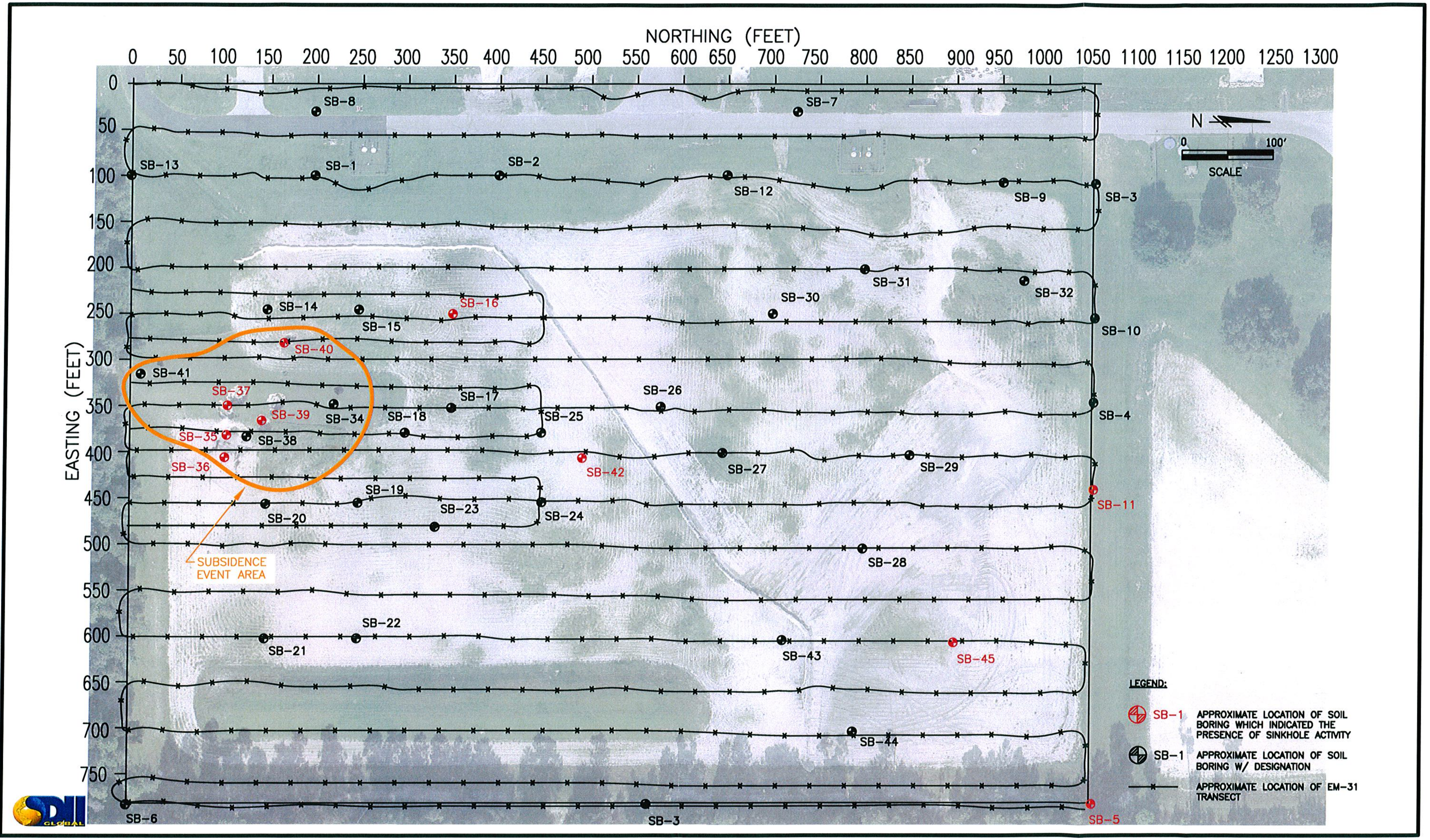

Figure No. 2-1
Pasco County Resource Recovery Facility
Electromagnetic Survey Transect Map and
Standard Penetration Test Boring Locations

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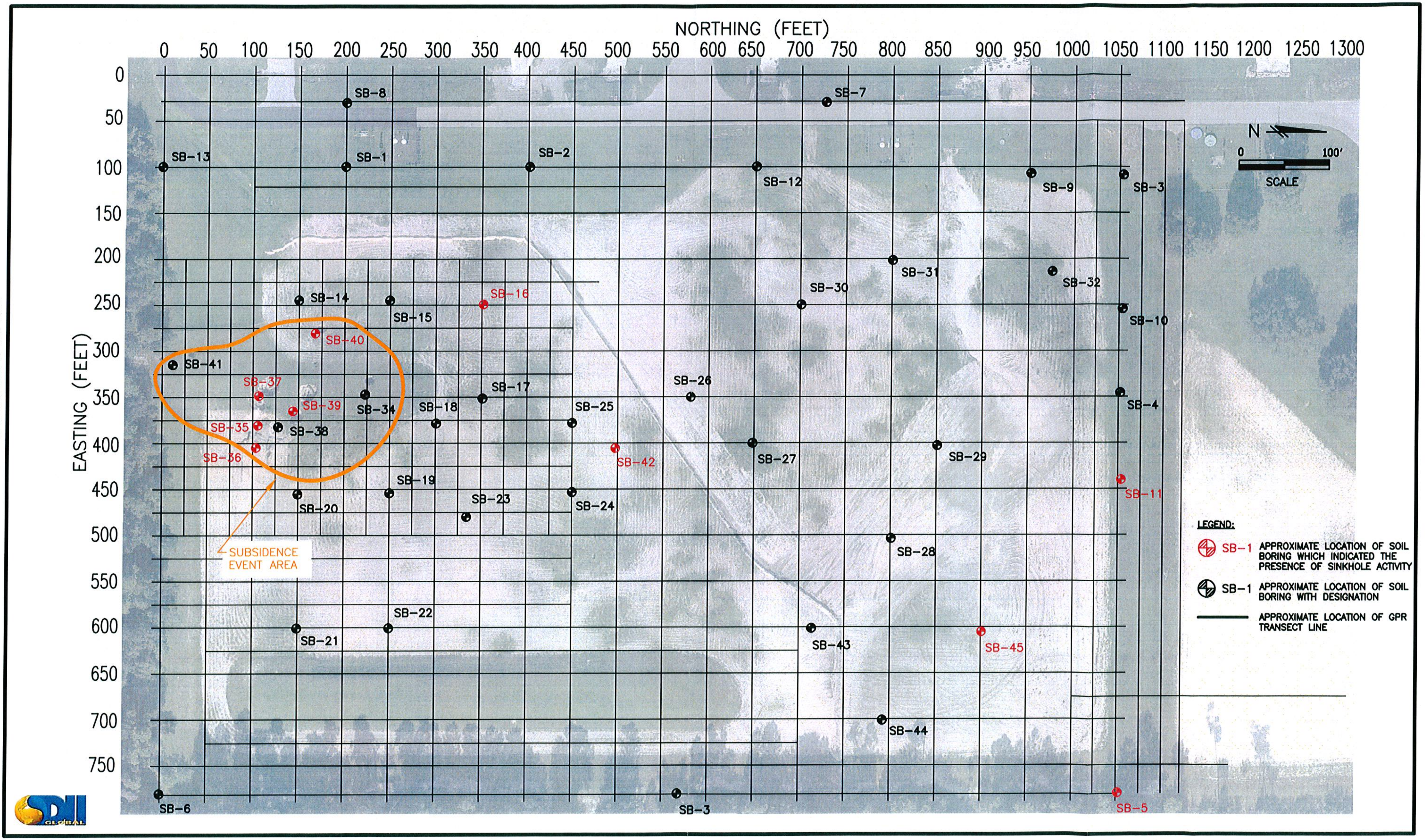

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Figure No. 2-2
Pasco County Resource Recovery Facility
Ground Penetrating Radar Survey Transect Map and
Standard Penetration Test Boring Locations

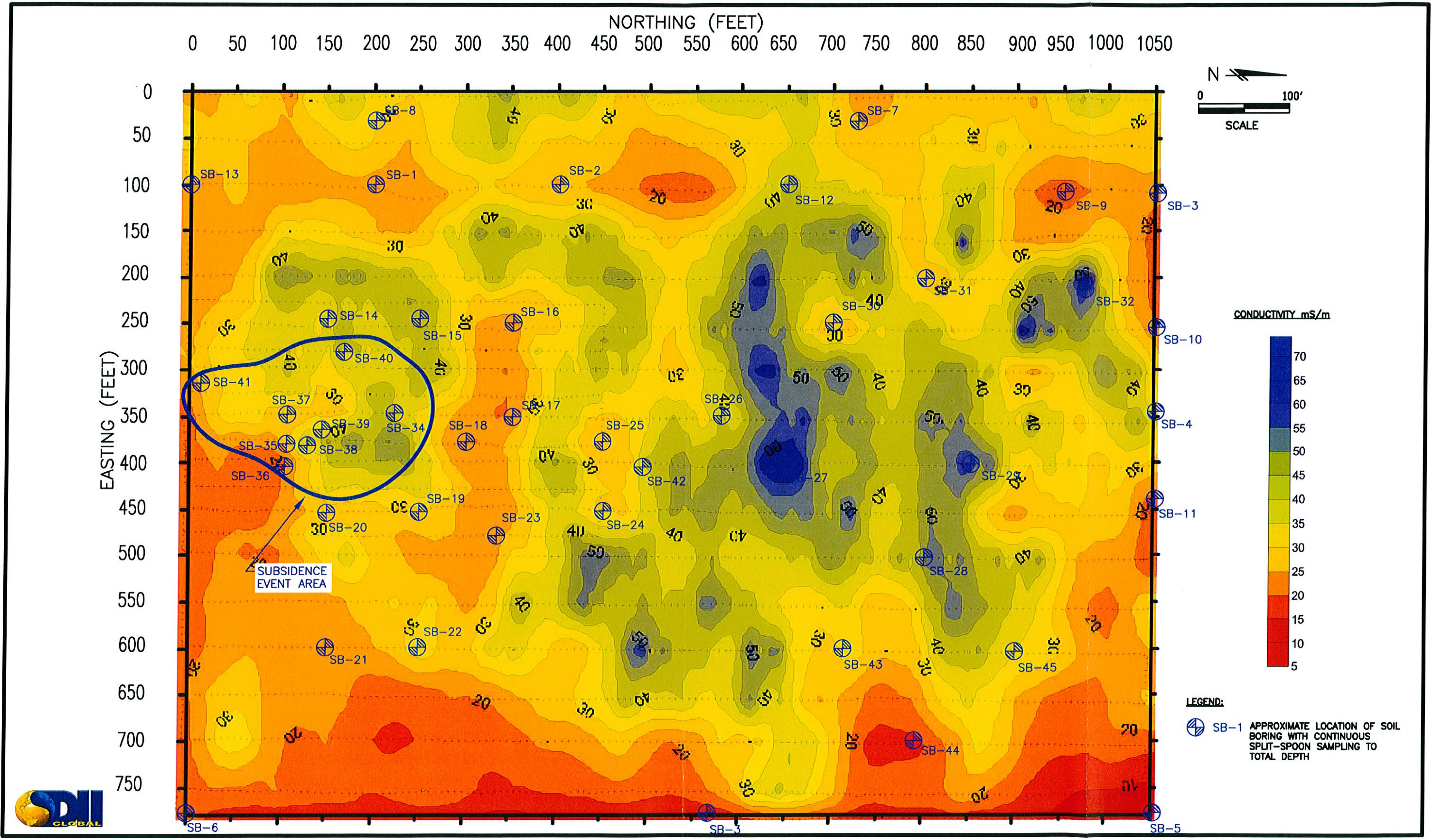

Figure No. 2-3
Pasco County Resource Recovery Facility
Electromagnetic Survey Results Map

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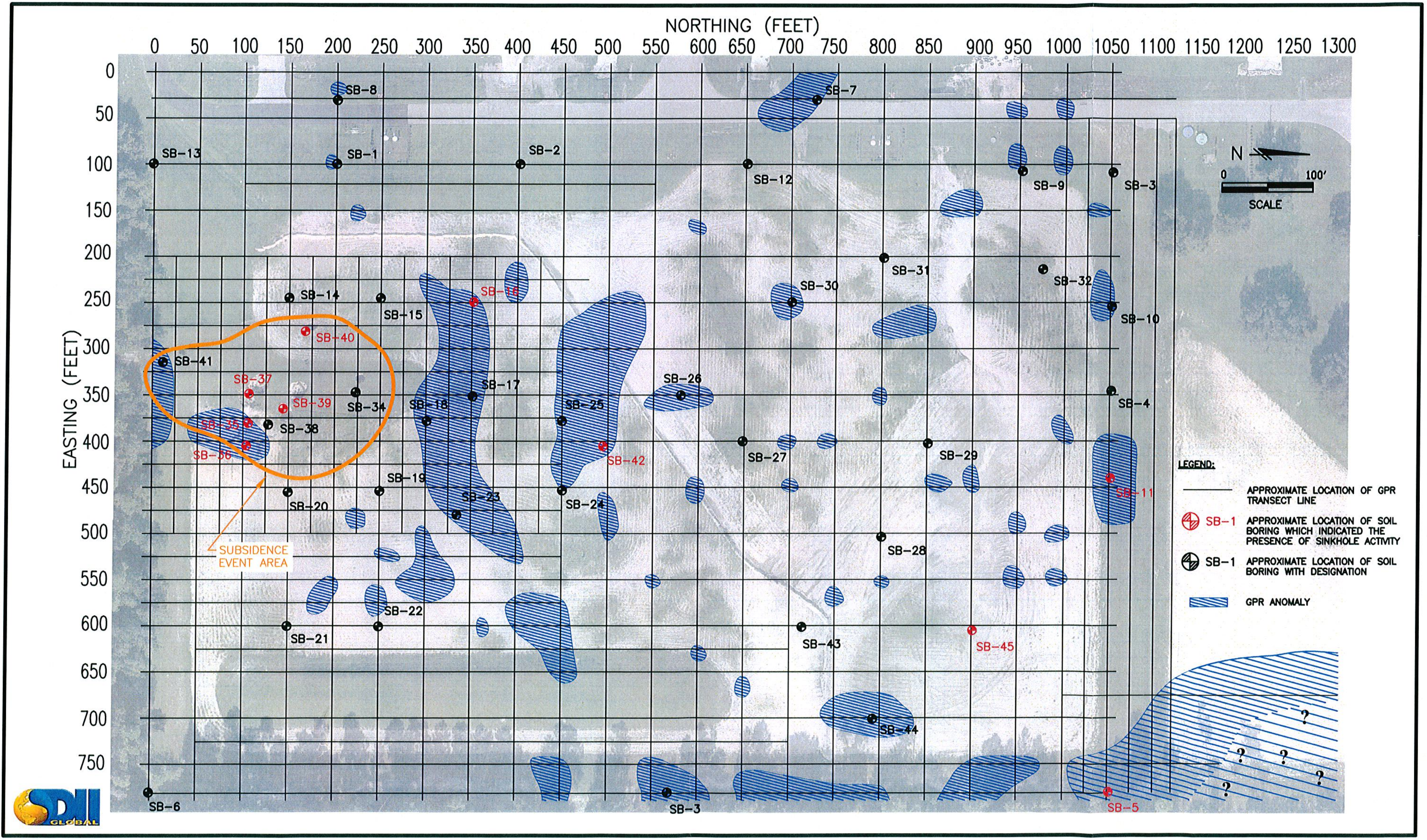

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Figure No. 2-4
Pasco County Resource Recovery Facility
Ground Penetrating Radar Anomalies and Standard Penetration Test Boring Locations

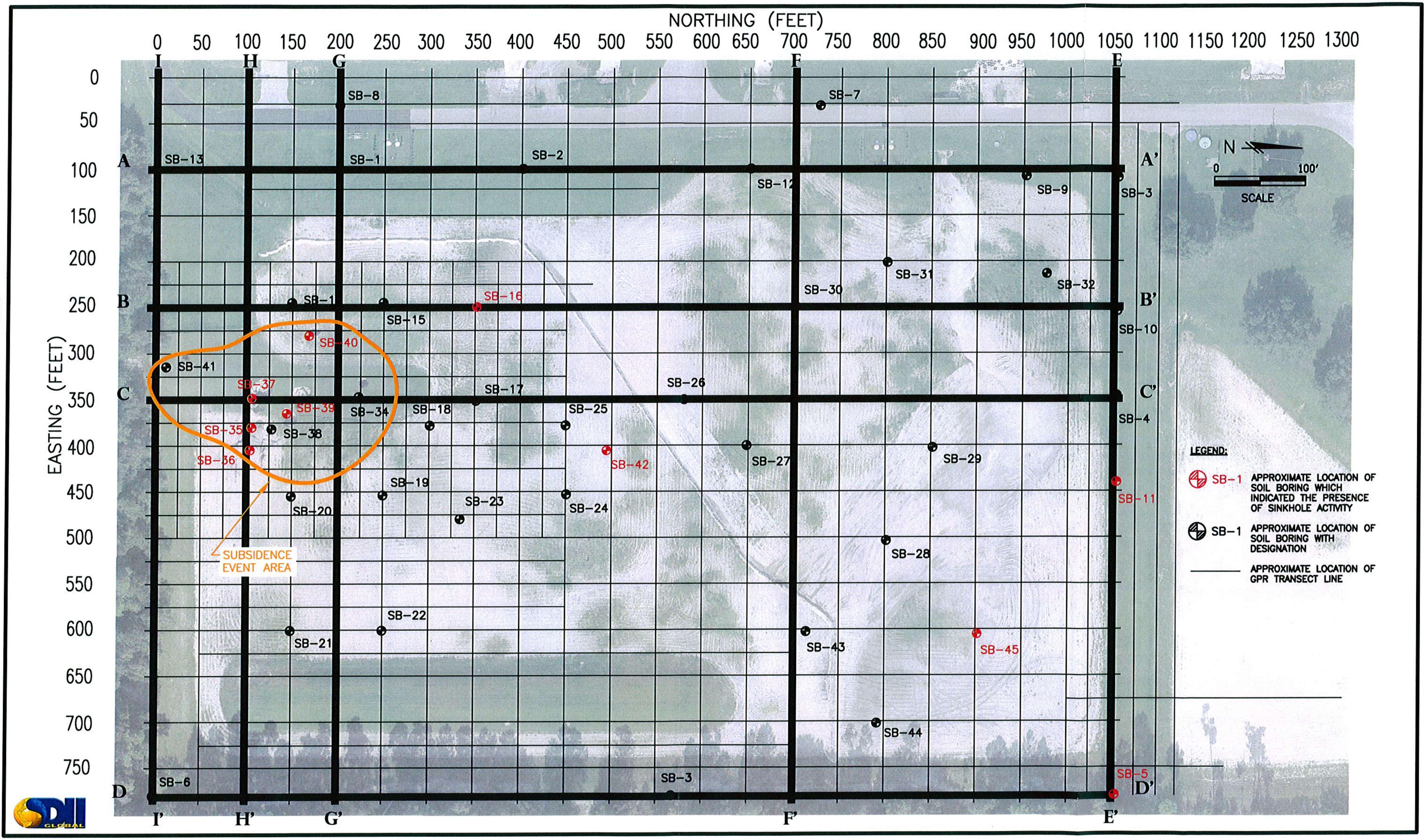

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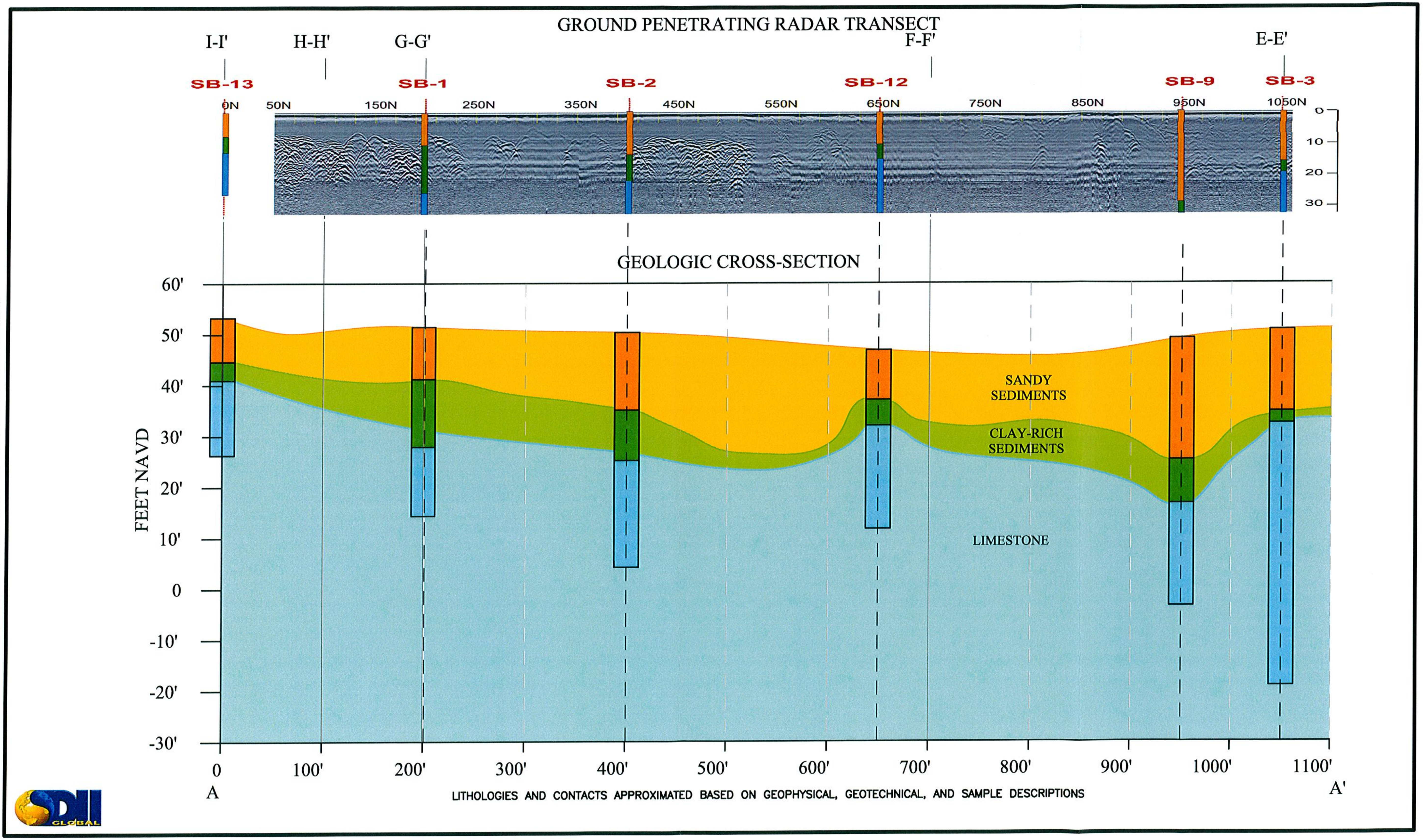
Figure No. 2-5
Pasco County Resource Recovery Facility
Geologic Cross Section Location Map



pw:\\dacpwapp1:PW_XM.1\Documents\G104\93934\03 Reports and Studies\11 Draft and Final Reports\CDM Smith Draft\Figures\01 cadd figures\FIG 2-6.dwg

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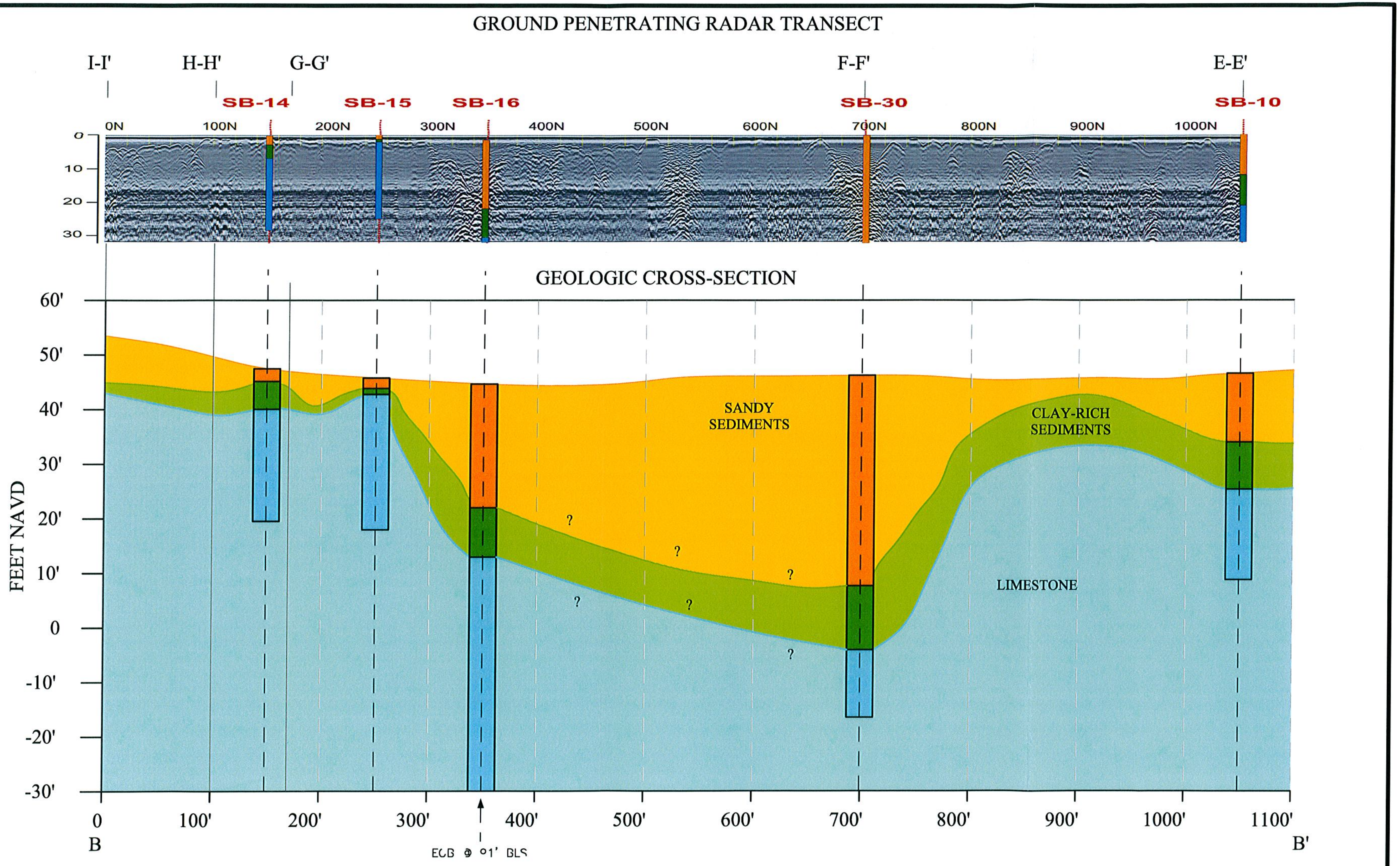
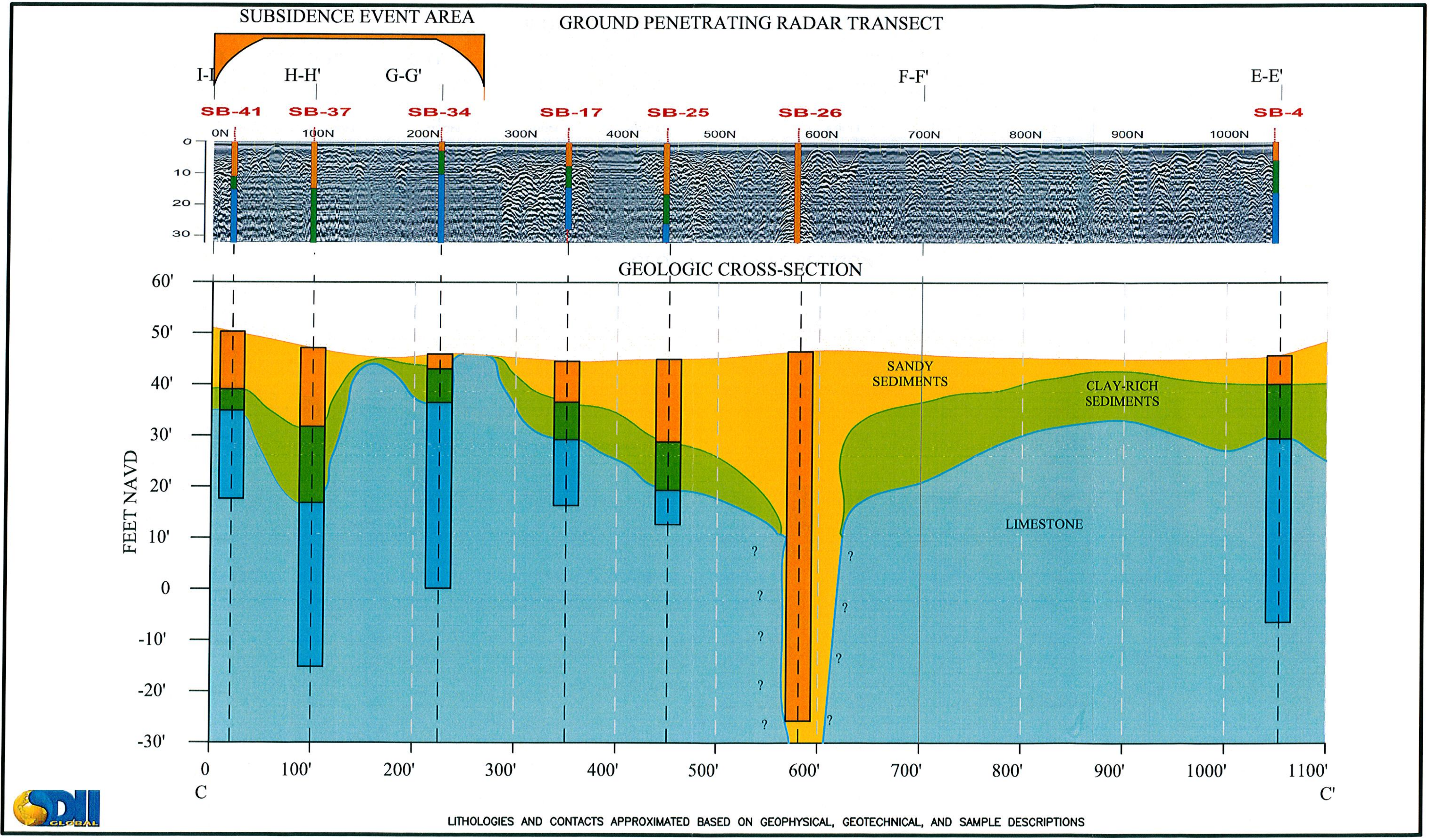
Figure No. 2-6
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section A-A'



LITHOLOGIES AND CONTACTS APPROXIMATED BASED ON GEOPHYSICAL, GEOTECHNICAL, AND SAMPLE DESCRIPTIONS

pw:\\dacpwapp1:PW_XM1\Documents\C104\03034\03 Reports and Studies\11 Draft and Final Reports\CDM Smith Draft\Figures\01 cadd figures\FIG 2-7.dwg

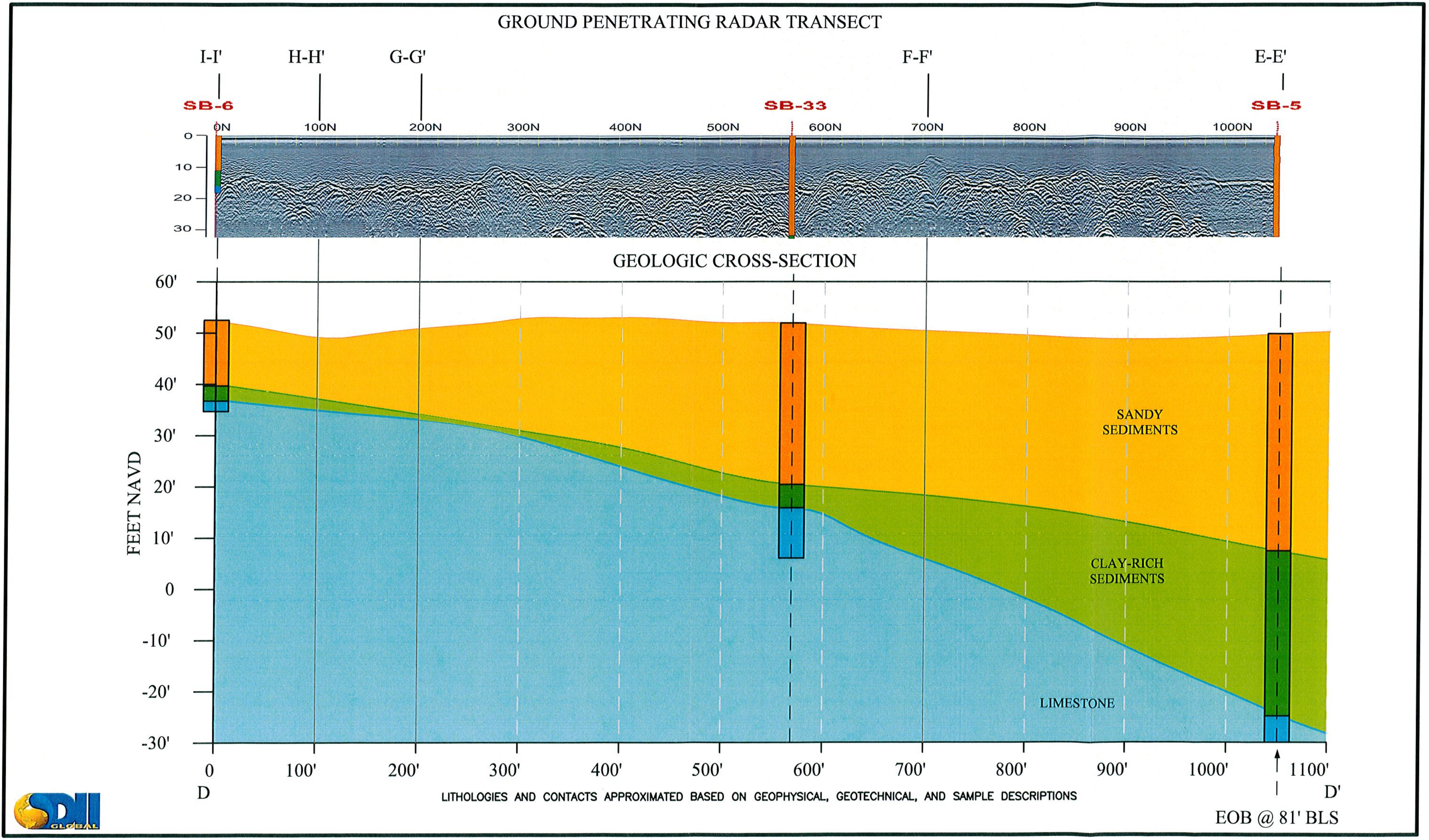
Figure No. 2-7
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section B-B'



LITHOLOGIES AND CONTACTS APPROXIMATED BASED ON GEOPHYSICAL, GEOTECHNICAL, AND SAMPLE DESCRIPTIONS

CDM Smith

Figure No. 2-8
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section C-C'



CDM Smith

Figure No. 2-9
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section D-D'

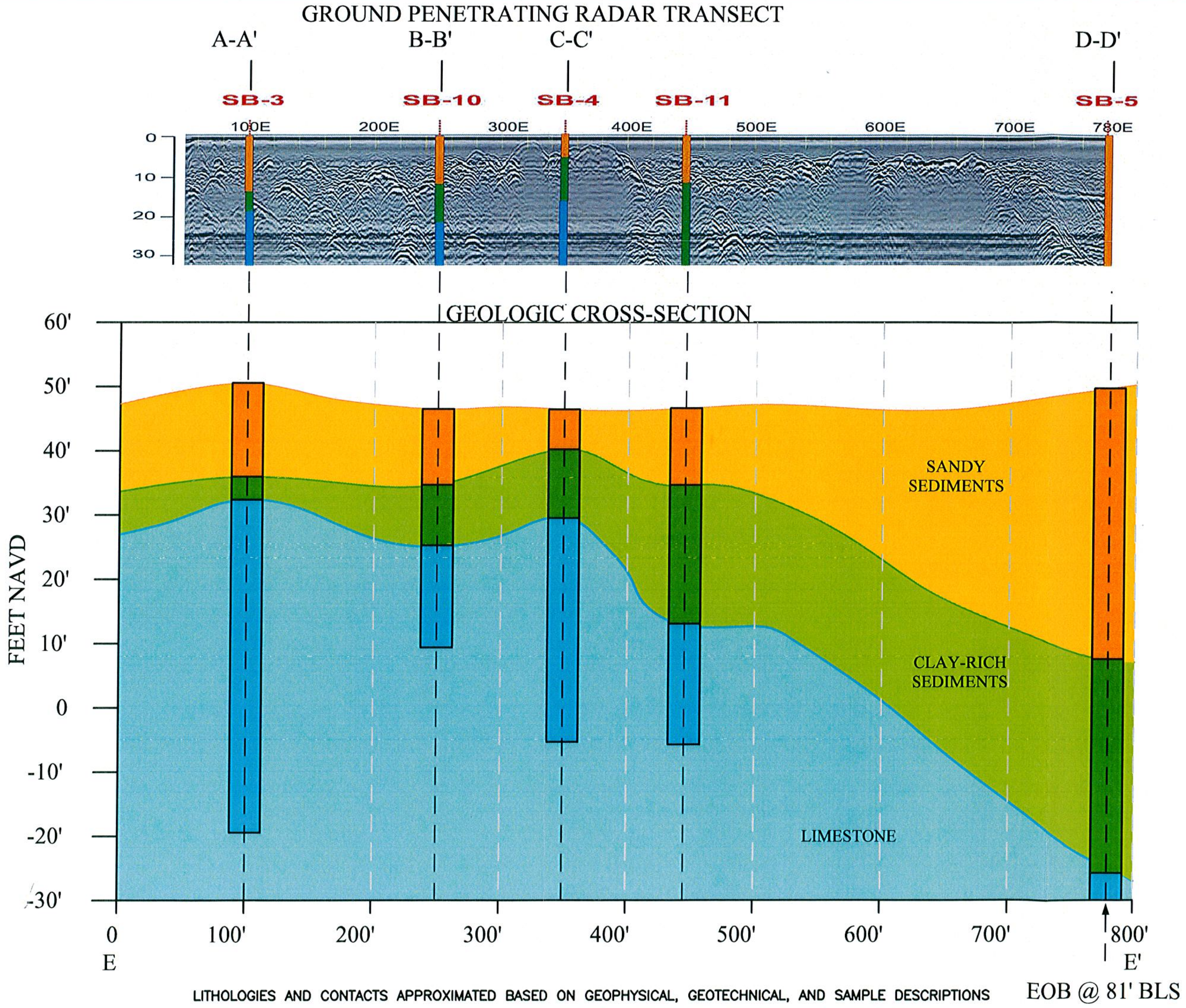


Figure No. 2-10
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section E-E'

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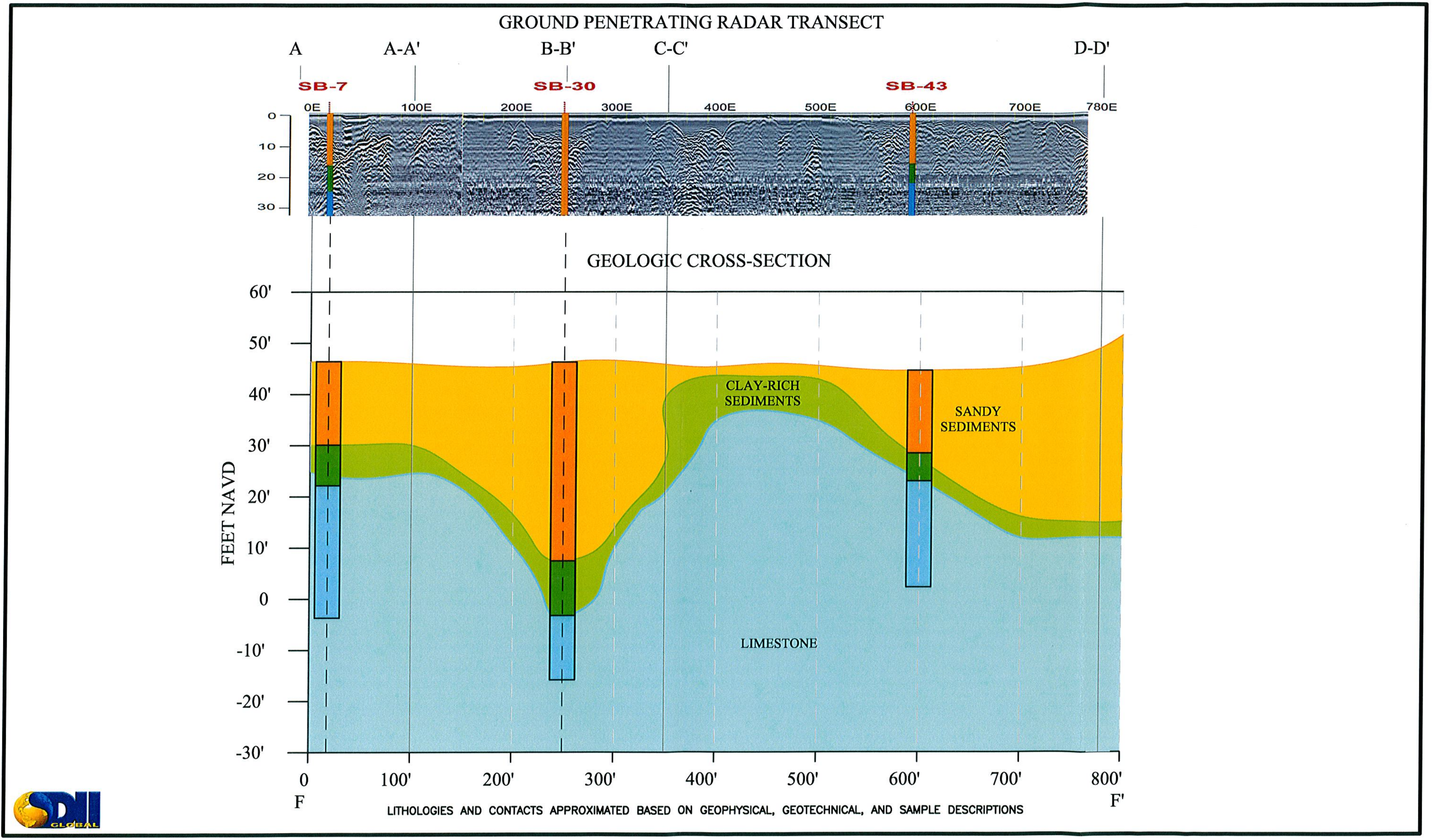
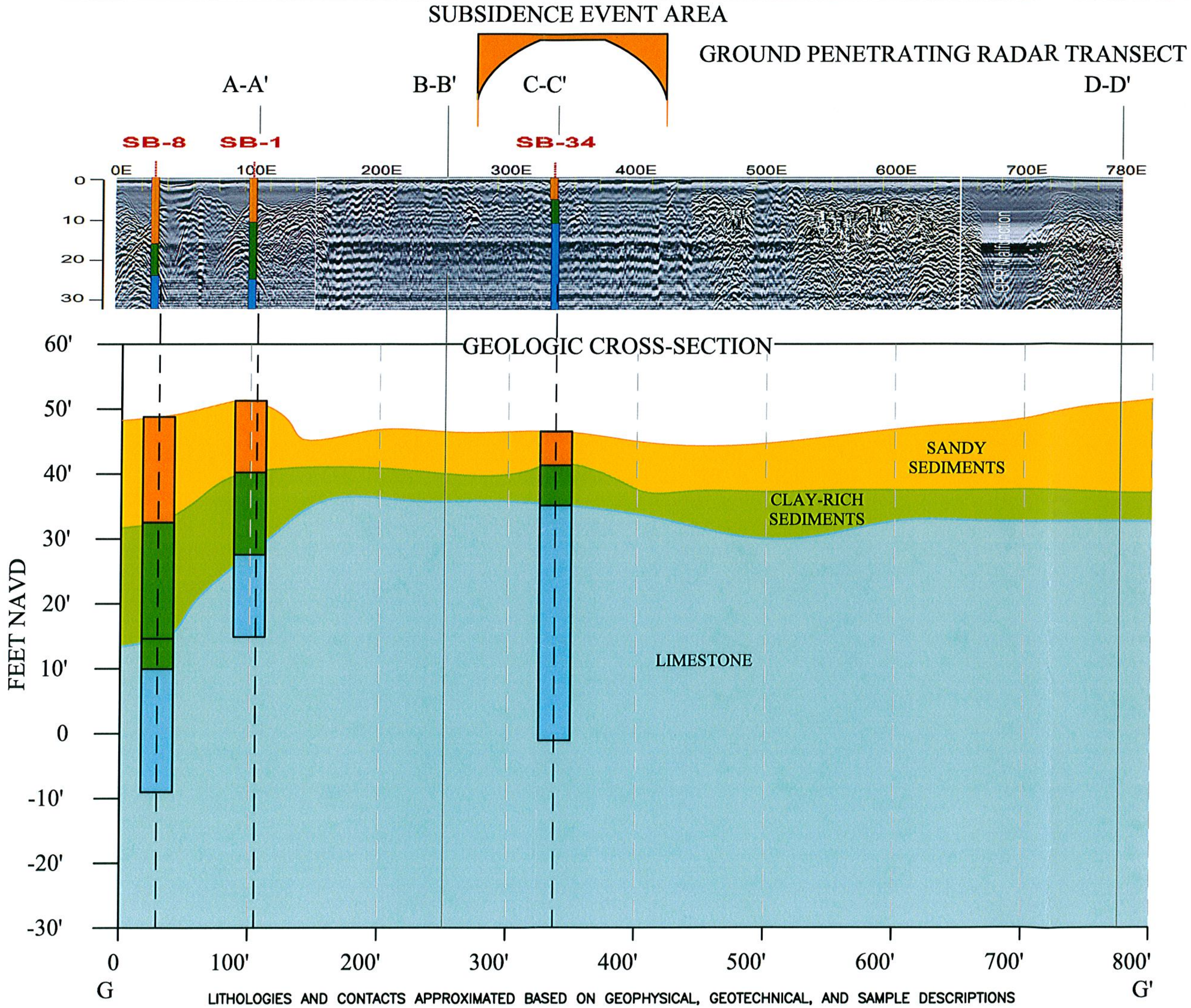


CDM Smith

Figure No. 2-11
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section F-F'



LITHOLOGIES AND CONTACTS APPROXIMATED BASED ON GEOPHYSICAL, GEOTECHNICAL, AND SAMPLE DESCRIPTIONS

Figure No. 2-12
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section G-G'

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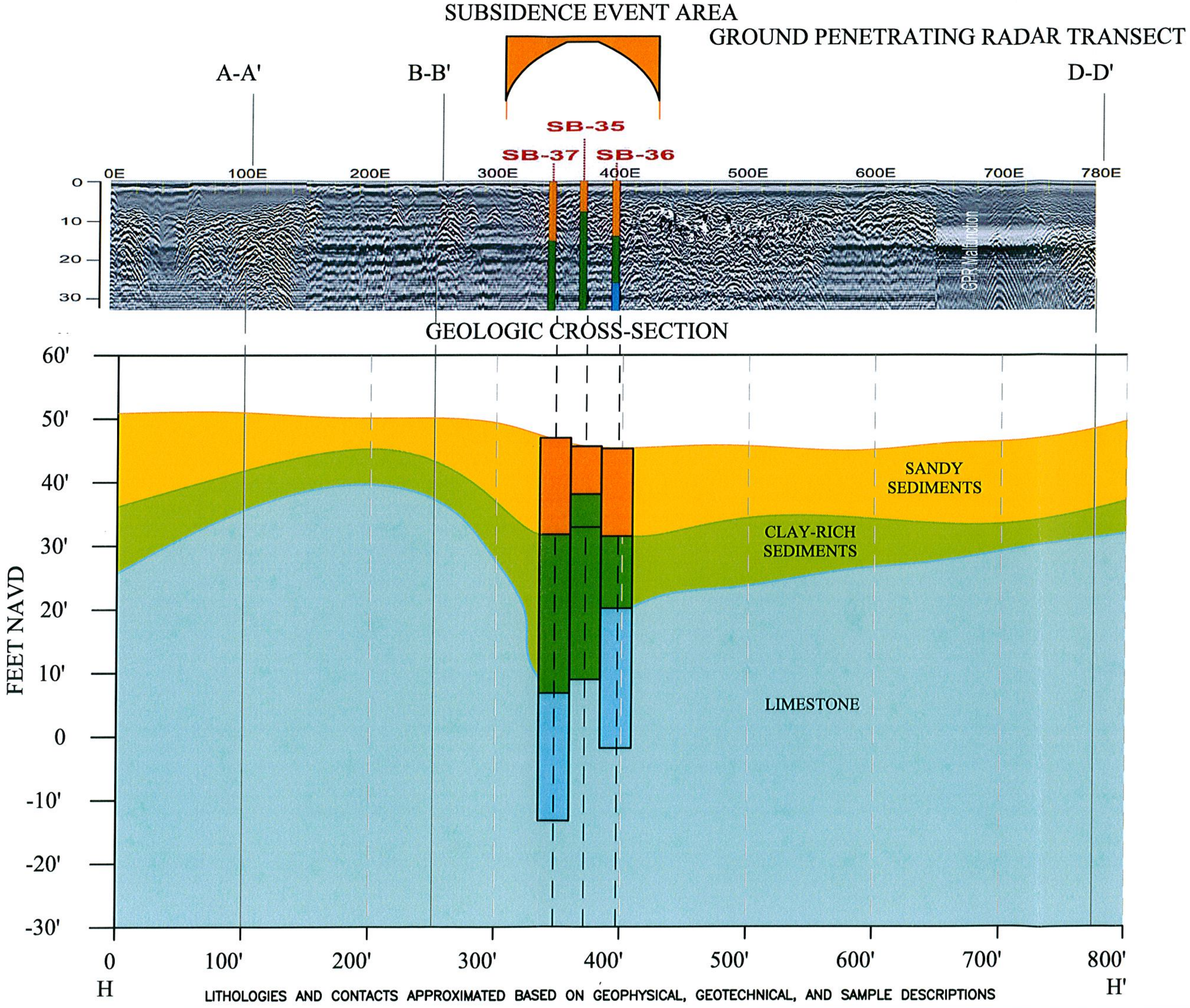
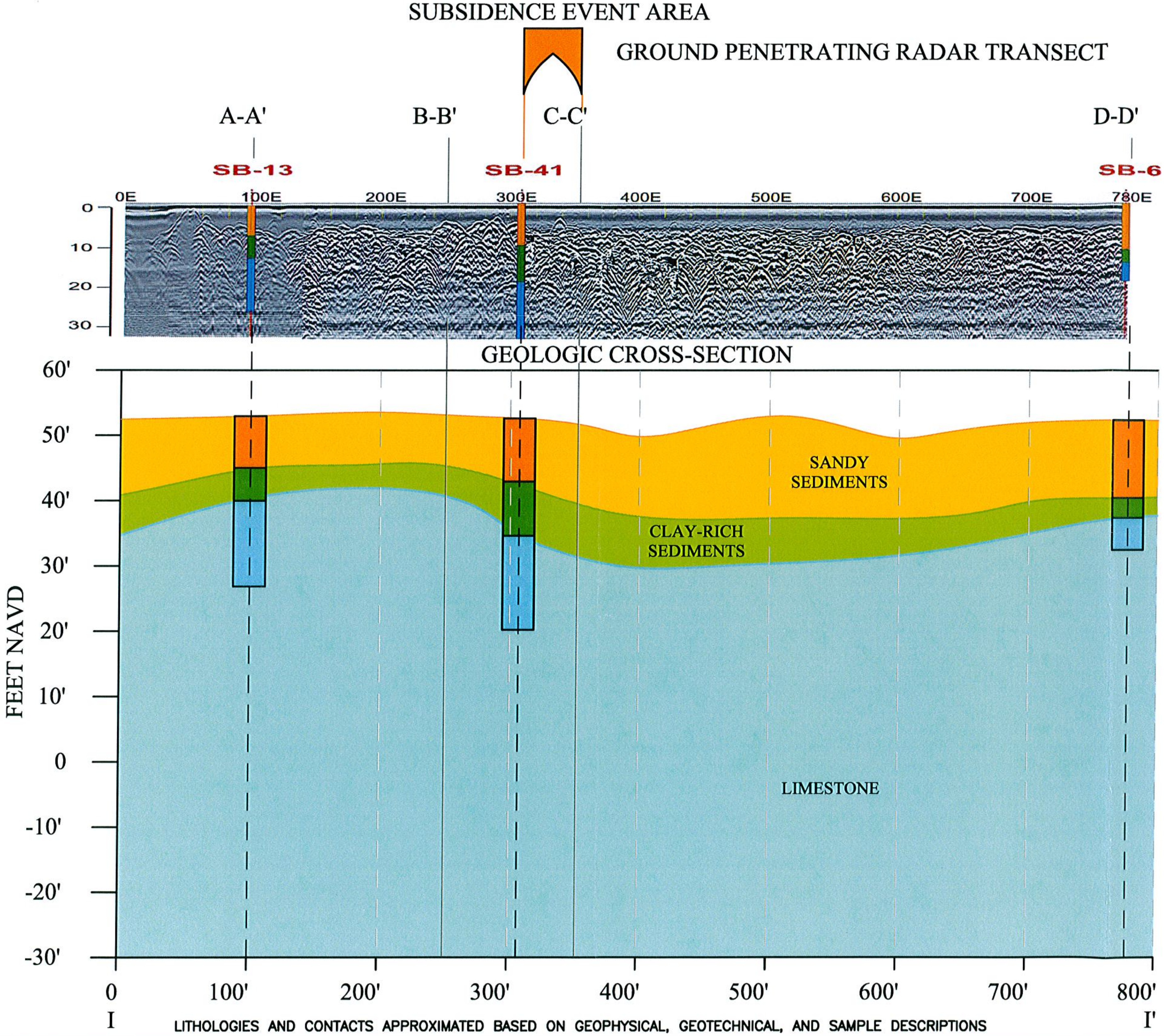


LITHOLOGIES AND CONTACTS APPROXIMATED BASED ON GEOPHYSICAL, GEOTECHNICAL, AND SAMPLE DESCRIPTIONS

CDM Smith

Figure No. 2-13
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section H-H'



LITHOLOGIES AND CONTACTS APPROXIMATED BASED ON GEOPHYSICAL, GEOTECHNICAL, AND SAMPLE DESCRIPTIONS

pw:\\dacpwapp1:PW_XM.1\Documents\C104\93934\03 Reports and Studies\11 Draft and Final Reports\CDM Smith Draft\Figures\01 cadd figures\FIG 2-14.dwg

SDII GLOBAL

CDM Smith

Figure No. 2-14
Pasco County Resource Recovery Facility
Ground Penetrating Radar and Geologic Cross Section I-I'

chimney-like subsurface structures that are predominantly sand-filled as seen in the anomaly borings advanced during the geotechnical phase of this investigation.

In the northeast corner of the south stormwater detention pond, the GPR identified an anomaly that is a large basin-shaped subsurface feature (Figure 2-4). As indicated by SPT boring SB-5, this depression is characterized by deep limestone and a thick volume of sand and clay. Examination of the pre-development survey of the site indicates that this anomaly had a surface expression prior to site development.

Excluding the northeast corner of the investigation area, the northern half of the detention pond exhibits numerous, smaller diameter vertical sand-filled structures indicative of "chimney sinks" (narrow, near circular, open or in-filled shafts in the underlying limestone and cover materials) that have been in-filled by overlying sand- and clay-rich cover sediments. In the southern half of the detention pond, the GPR anomalies have a larger footprint and, on the GPR cross sections, have an appearance characterized by overlapping or coalesced smaller structures.

In the vicinity of the recent surface depressions (features within the "Subsidence Event Area"), there is a small area of decreased electrical conductivity. The decreased electrical conductivity is consistent with the presence of shallow sand fill material and CLSM fill used to backfill the depressions. The GPR data in the Subsidence Event Area showed mixed results.

The subsidence features in the Subsidence Event Area are not all isolated, individual features. They reflect a network of drainage features associated with a smaller number of chimneys in the underlying limestone. Some GPR anomalies in the Subsidence Event Area clearly indicate vertical, sand-filled chimney structures. These tended to be observed in the larger depressions. The other, smaller depressions in the Subsidence Event Area, however, showed only shallow indications ("diffractions" or highly curved reflections) of voids in the cover and very shallow limestone. In these areas, short lateral conduits in the cover at the top of the limestone combined some associated clay content or interbedding have attenuated or interrupted the GPR signal and reduced GPR penetration. With the reduced penetration, the GPR is only imaging discontinuities in the cover and very shallow limestone surface.

The GPR data were combined with the SPT boring data to construct geologic cross sections in both east-west and north-south directions at the site (Figure 2-5). The cross sections (Figures 2-6 through 2-14) include a GPR profile at the top of the figures. Superimposed on the GPR profiles are the results of the SPT borings intersected by the profiles. The SPT data depict the distribution and thickness of the sand, clay, and limestone along each profile for the purpose of ground truthing the GPR data. Below the GPR profiles are geologic cross sections showing the SPT data with land surface profiles and interpolated contacts between the lithologic strata. The interpolations were constructed by first connecting the lithologic contacts from borehole to borehole. The GPR profiles and kriged contour maps show the elevations of the tops of the clay and limestone strata with respect to the North American Vertical Datum of 1988 (NAVD 88). These data were used with geologic descriptions from SPT borings to prepare geologic cross-sections.

2.2.3 Site Geology

The geology of the site and immediate vicinity were evaluated using data from the SPT borings and, to a lesser extent, the geophysical data. Boring logs are included in **Appendix C**. The geologic cross-sections and SPT data were used to develop a conceptual model of the stratigraphy and karst at the site.

The uppermost stratum is a mantle of Pleistocene marine terrace sediment; primarily sand. The thickness of the near-surface sandy sediments, which were predominantly sand, silty sand, and/or clayey sand, ranged from near zero at SPT boring SB-27 to greater than 70 feet at SPT boring SB-26. Based on the standard penetration tests completed at each boring location, "N values" of this stratigraphic unit indicated the sediment exhibited very loose to medium dense relative strengths. Sandy sediments are not cohesive and are easily transported by wind, water, and gravity. As a result, it is this material that ravels or migrates into cavities in the underlying limestone when sinkholes develop.

Below the sandy sediment is a horizon of clay-rich sediment. This material is residuum from the Miocene Hawthorn Group. The clays have been reworked and weathered. As a result, the clay is often mixed with sand or limestone fragments from the underlying limestone. Reworking and development of sinkholes in the geologic past have caused many of the karst features observed at the site to be filled with clay, which renders the chimney sinks to be inoperative.

The top of the sandy clay and clay stratum was present generally between elevations +45 feet and more than -35 feet NAVD88 (**Figure 2-15**). Thickness varied from less than 5 feet to approximately 20 feet (**Figure 2-16**). The clay and sandy clay was relatively soft to very stiff. The clays of the clay-rich stratum are cohesive. As a result, they resist transport including raveling into karst void features. At the site, the clay-rich stratum locally serves to isolate the stormwater pond from subsidence feature development during ponding events.

The clay-rich stratum is thickest and has fewer penetrations in portions of the northern half of the site (Figure 2-16). This is significant because the clay-rich stratum reduces the risk of sinkhole activity in areas where it has fewer penetrations and is thicker.

The uppermost limestone unit consists of the Oligocene Suwannee Limestone. The Suwannee is a poorly to well lithified, relatively pure limestone with both primary (depositional) and secondary (fracture- and karst-related) porosity. The uppermost portion of the limestone has been subjected to weathering during periods of subaerial and subaqueous exposure and groundwater flow. As a result, the limestone surface is highly irregular and has more than 75 feet of relief at the site as shown on **Figure 2-17**.

In addition to the large-scale weathering and erosional features, small pinnacles and depressions with relief of less than one foot to over three feet are locally present on the weathered surface as observed in several of the depressions in the Subsidence Event Area. In addition, weathering has resulted in the karst conduits known as chimney sinks. This upper, highly weathered zone of the limestone, which is called the epikarst, has relatively high permeability unless sand and clay from the overlying sediments fill the pore space. Where voids exist in the epikarst, water can move laterally and vertically into karst conduits, causing sinkhole development. The subsidence features in the Subsidence Event Area reflect this movement, with subsidence features developed over the chimneys and as peripheral features where water moved from the stormwater impoundment laterally into the main subsidence feature.

The top of the epikarst was present between elevation +40 feet and more than -35 feet NAVD88 and ranged in thickness from less than one foot to greater than 50 feet. The sediment of the epikarst was predominantly clay-rich with limestone fragments and was relatively soft to hard. While subsidence feature development was observed in the Subsidence Event Area around SB-35 through SB-39, the epikarst-related features observed within the remainder of the southern detention pond area showed no signs of reactivation.

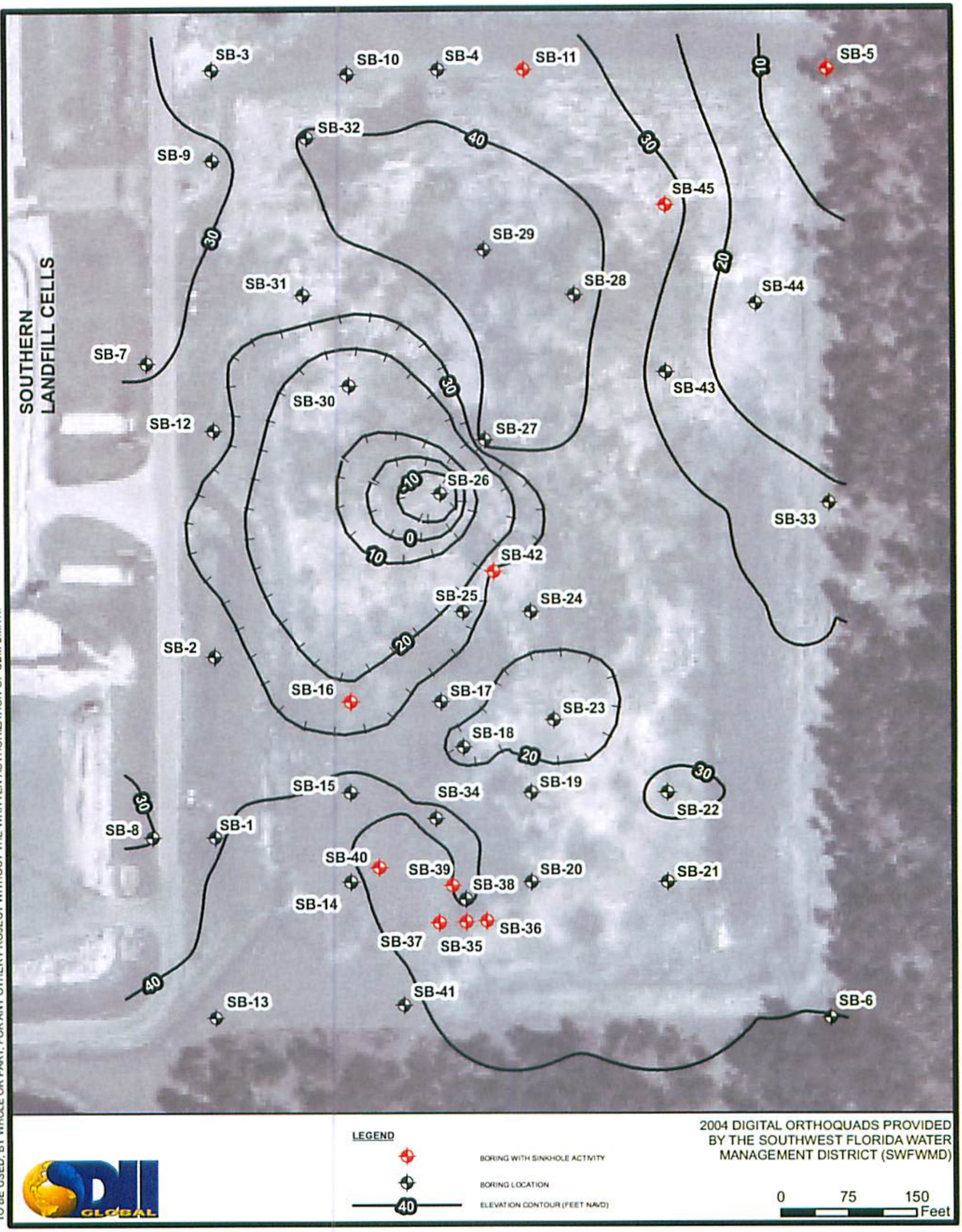


Figure No. 2-15
Pasco County Resource Recovery Facility
Estimated Top of Clay-Rich Sediment
(10-Foot Contour Interval)

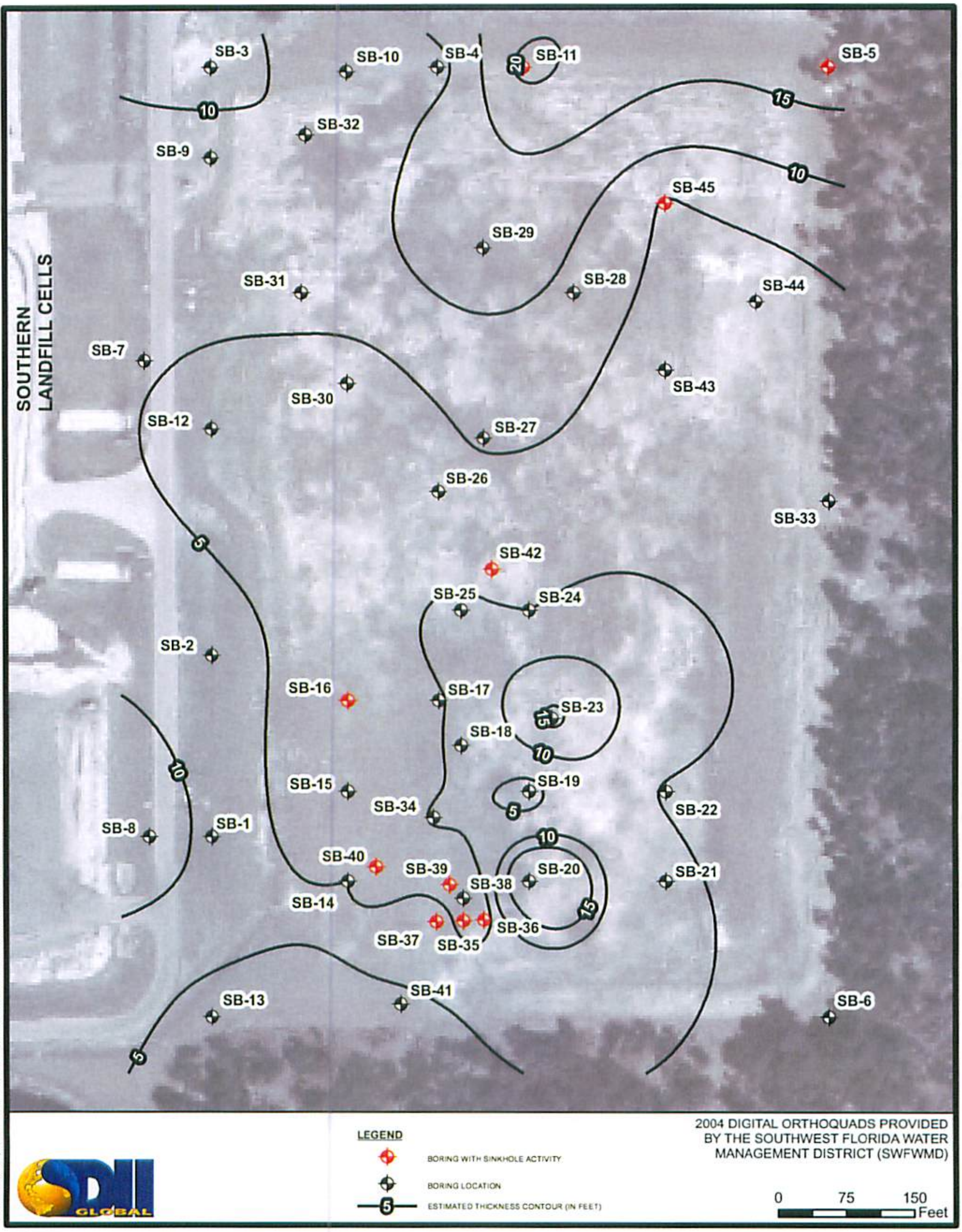
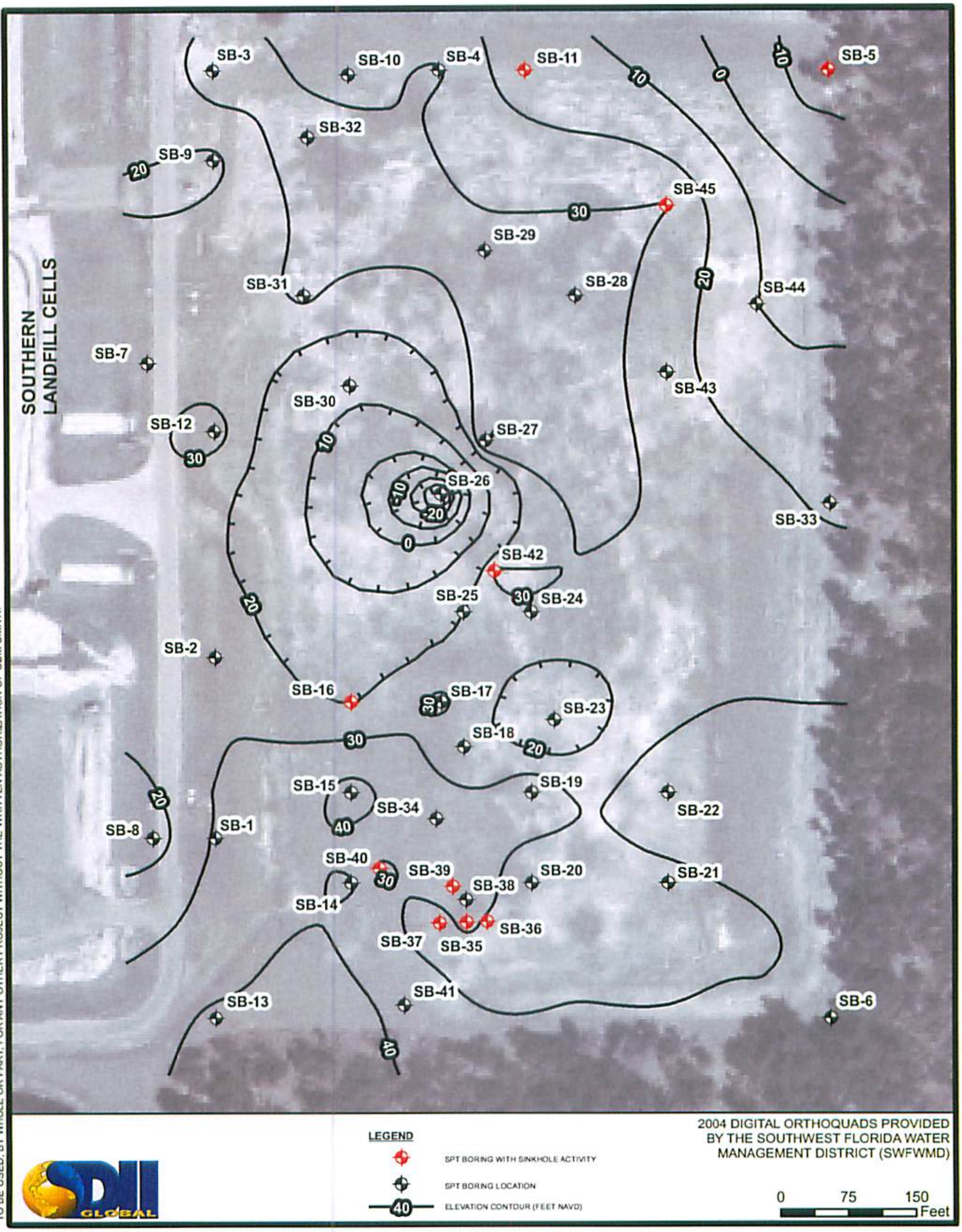


Figure No. 2-16
Pasco County Resource Recovery Facility
Estimated Clay-Rich Sediment Thickness
(5-Foot Contour Interval)



2004 DIGITAL ORTHOQUADS PROVIDED BY THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)

Figure No. 2-17
Pasco County Resource Recovery Facility
Estimated Top of Limestone Including Epikarst
(10-Foot Contour Interval)

The main body of the karstic Suwannee Limestone was encountered between elevations +30 feet and greater than -35 feet NAVD88. This more-massive limestone ranged in relative strength from weak to refusal strength (SPT N values greater than 50).

Sandy horizons within the limestone reflect infilling of paleo-karst features such as karst conduits, relict subsidence features and other solution cavities. There are no known syndepositional sandy beds within the limestone.

As part of the geologic investigation, a photolineament map was prepared to help evaluate potential sinkhole-prone areas near the site. Photolineament maps are commonly prepared as part of a karst investigation because the photolineaments may reflect fractures and karst conduits in the underlying limestone. Note that photolineaments are simply features, such as depressions, linear soil tones, plant communities, and stream segments that are aligned on aerial photographs or topographic maps. One should not conclude that photolineaments depicted on an aerial photograph reflect fractures without ground truthing them.

Figure 2-18 is the photolineament map on a pre-development aerial photograph from 1941. The photolineament map suggests that one northeast-southwest photolineament encroaches on the southern part of the site. However, no major photolineaments are evident in the western part of the detention pond or in the vicinity of the landfill cells.

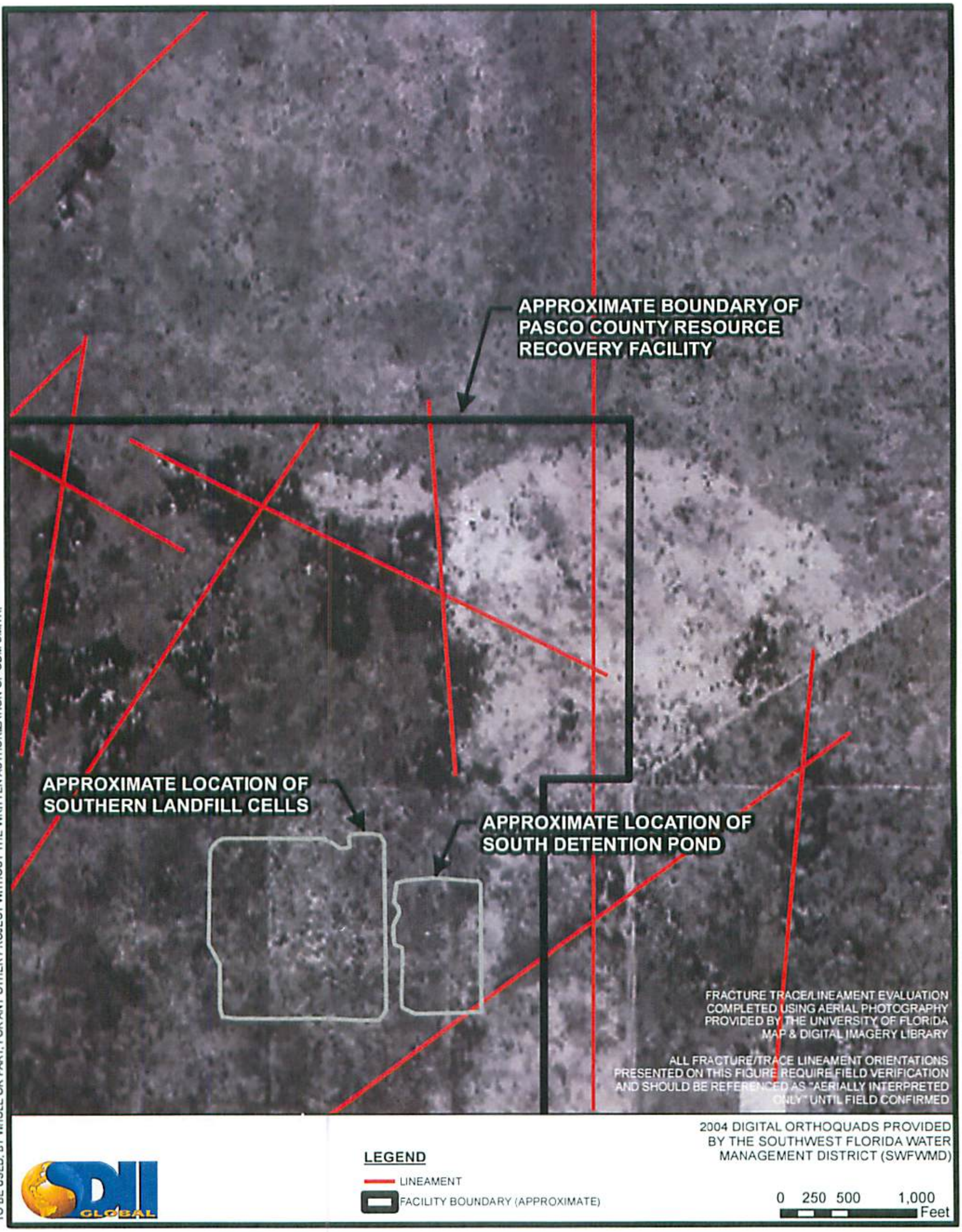
2.3 Geotechnical Investigation

In addition to providing verification for the geophysical data from the GPR and EM surveys and characterizing geological conditions, data from SPT borings were used to characterize the karst and sinkhole conditions. Early in the geotechnical phase of this investigation, both the EM-31 conductivity anomaly map (Figure 2-3) and the positions of the GPR anomalies (Figure 2-4) were reviewed, and SPT boring locations were selected based in large part on the geophysical results, thus satisfying the main objective of the geophysical investigation and providing sufficient data to evaluate sinkhole activity and sinkhole risk.

Split-spoon sampling was conducted continuously within at least the top 10 feet of each boring, and at 5-foot intervals thereafter. Split-spoon samples were collected in accordance with ASTM D1586 (2-inch-diameter sampler driven 24 inches by blows from a 140-pound hammer falling freely for a 30-inch drop). The number of blows required to drive the sampler each 6-inch increment were recorded. The Standard Penetration Resistance (N-value) was calculated as the sum of the blows over the second and third 6-inch increments of penetration.

In Florida, statutory definitions (Chapter 627.706 Florida Statutes) for property insurance have resulted in a dual classification of sinkholes. Sinkholes are landforms or depressions in the land surface. Sinkhole activity is defined by the pattern of systematic weakening of sediments as they migrate into the underlying void. Since the onset of raveling may not be immediately accompanied by development of a depression in the land surface, sinkhole activity is considered as a precursor to actual development of a sinkhole landform.

There is a pattern of systematic weakening of the cover materials with depth even though there is no landform. The depressions in the Subsidence Event Area are sinkholes using this dual classification and are known as cover-collapse and suffosion sinkholes.



FRACTURE TRACE/LINEAMENT EVALUATION COMPLETED USING AERIAL PHOTOGRAPHY PROVIDED BY THE UNIVERSITY OF FLORIDA MAP & DIGITAL IMAGERY LIBRARY

ALL FRACTURE/TRACE LINEAMENT ORIENTATIONS PRESENTED ON THIS FIGURE REQUIRE FIELD VERIFICATION AND SHOULD BE REFERENCED AS "AERIALLY INTERPRETED ONLY" UNTIL FIELD CONFIRMED

2004 DIGITAL ORTHOQUADS PROVIDED BY THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)

Figure No. 2-18
Pasco County Resource Recovery Facility
Fracture Trace/Lineament Evaluation
February 15, 1941 USDA (CTT-9B-28)

Cover-collapse sinkholes, as developed in the south detention pond, are common throughout central and north Florida. They form when there is a void near the top of the limestone that has been bridged over by clay- and sand-rich sediments. As noted above, the cover consists of a layer of clay-rich sediments overlain by a layer of sand. Since the clay is normally cohesive and capable of supporting the load generated by the cover materials, most voids are bridged. When a soil or rock bridge fails or collapses, the overlying, easily transported sandy sediments migrate (ravel) into the void space forming a cover-collapse sinkhole. Raveling is the process of migration of soils into the voids within the underlying limestone. Since sinkhole activity is a "bottom-up" process, raveling is identified by systematic weakening of the soils with depth.

The process of raveling should be expected to result in an organized pattern of weakening of the soils with depth. Individual horizons of weak soil sediment separated by stronger soils do not constitute a pattern reflecting sinkhole development. A pattern of systematic weakening is generally considered to exist when there is a fairly regular decrease in soil strength with depth. However, there are situations where sediment strength systematically decreases with depth as a result of common geological conditions other than sinkhole activity, such as at erosional or weathering surfaces.

In addition to sinkholes developing by failure of the roof of the void, they can form by direct raveling of the non-cohesive cover materials into void space in the limestone without failure of a void-roof. This transport by running water or soil creep creates what is known as a suffosion sinkhole.

Identification of sinkholes is much easier than identifying sinkhole activity. Sinkholes are depressions that can be assumed to have karst origins if there is no man-made void, pipeline, or other feature that could have caused the collapse. The presence of voids in the limestone and isolated artifacts of SPT drilling that do not fit the pattern of cover raveling should not be construed to indicative of sinkhole activity. Patterns in the SPT blow count data that reflect the raveling process must be present to identify sinkhole activity.

Identification of sinkhole activity and/or the potential for development of subsidence features in the immediate vicinity of the south detention pond, was performed by evaluating the following in the proper geologic context and pattern of sinkhole development:

- Pattern of declining N values over more than three sampling intervals in the sandy portion of the cover;
- Loss of drilling fluid circulation that is above the limestone and epikarst; and
- If the SPT is near the throat of the developing sinkhole the pattern of declining N values is likely to culminate in either weight-of-rod or –hammer strength materials (N values of 0).

Where these lines of evidence fit the expected pattern of raveling, one can conclude that sinkhole activity is present. These patterns may not be evident in GPR and EM-31 data. However, disruption of GPR reflectors and sudden decreases in terrain conductivity may reflect locations where the sediments are beginning to ravel.

In order to determine the risk of reoccurrence and/or future subsidence-related issues within the south stormwater detention pond and to evaluate the potential subsidence-related risks associated with the landfill cells to the west of the Subsidence Event Area and to the north, SPT borings were advanced to evaluate the subsurface conditions for raveling associated with sinkhole activity.

Locations for the SPT borings were determined through evaluation of geophysical and topographical data, as well as visual observation.

Within the vicinity of the subsidence event area, the following SPT borings indicated the presence of sinkhole activity: SB-16, SB-35, SB-36, SB-37, SB-39 and SB-40. Evidence of sinkhole activity was also observed in SB-42, which is located due north of the area of sinkhole development, as well as, SB-5, SB-11, and SB-45, within the northeastern corner of the southern detention pond. Figure 2-4 shows the locations of the SPT borings and identifies those borings that were located in the Subsidence Event Area or were located where sinkhole activity may be occurring. Descriptions of these borings follow.

SB-5: At this location, the extent of the cohesive material above the limestone and the total depth to the limestone surface indicate that long term settlement in the immediate vicinity of this boring would be likely, and rapid development of a sinkhole is unlikely. After fluctuating slightly to 15.5 feet bls through poorly graded sand, the N values in SPT boring SB-5 generally declined to 35.5 feet bls through poorly graded sand, including weight-of-hammer strength materials from 31 to 31.5 feet bls and from 34.5 to 35 feet bls. The SPT N values then increased to 45.5 feet bls before declining through interbedded sand and clay, including weight-of-hammer strength material from 51 to 52 feet bls. There were consecutive weight-of-rod events from approximately 54 to 76 feet bls within clay and a thin interbedded layer of sand, which was encountered from 66.5 to 67.5 feet bls. Below 75 feet bls, N values increased through poorly graded sand and limestone, which was encountered at 76.2 feet bls. The boring was terminated at 81 feet bls within limestone. Rapid losses of drilling fluid circulation occurred at 54 and 68 feet bls. Advancing the casing allowed drilling to be completed without borehole collapse. The systematic decline in N values above the clay, accompanied by a total of 23 feet of consecutive sampling intervals with weight of rod/hammer events within the clay and the rapid losses of circulation above the limestone, provide evidence for sinkhole activity in SB-5.

SB-11: At this location, the extent of the cohesive material above the limestone indicates that long term settlement in the direct vicinity of this boring would be likely and that the rapid development of a sinkhole is unlikely. In SPT boring SB-11, the N values increased to 11.5 feet bls within poorly graded sand and then declined systematically within clay culminating in weight-of-hammer from 25 to 27 feet bls and weight-of-rod conditions from 30 to 31.5 feet bls. A weight-of-rod event occurred at 20 feet bls within the seating interval; however, per ASTM D1586, this is not utilized in determining the relative sediment strength of the encountered sample. A rapid loss of circulation occurred at 29 feet bls. The N values increased within limestone, which was encountered at 33.5 feet bls. The boring was terminated in refusal strength limestone at 52 feet bls. The systematic decline in N values within the clay, accompanied by a total of 3.5 feet of weight-of-rod/hammer strength material and a rapid loss of drilling fluid circulation, all above the limestone, provide evidence for sinkhole activity in SB-11. The limited extent of stiff clay is insufficient to prevent sagging of the cohesive materials.

SB-16: Data from this boring does not indicate upward propagation of loosening conditions and may only represent a potential for localized long term settlement rather than the rapid development of a sinkhole in the near-term. However, because of the intervals of weight-of-rod/hammer materials and repetitive rapid losses of drilling fluid circulation, lateral raveling of the sediments cannot be eliminated as a potential cause of the intervals of very loose or very soft sediments. The N values in SPT boring SB-16 generally increased through poorly graded sand and a thin clay layer, which was encountered from 14 to 15.5 feet bls, to approximately 21.5 feet bls. The N values then declined through clay-rich sediment and fluctuated to the top of limestone, which was encountered at 61.5 feet bls. A weight-of-hammer event occurred within the seating interval at 30 feet bls. This weight-of-hammer event is considered to be an artifact of the drilling process and is not considered important. Significant weight-of-hammer conditions were encountered from 40 to 41.5 feet bls, 46 to 46.5 feet bls, and 56 to 57 feet bls. A weight-of-rod event also occurred within the seating interval at 50 feet bls. The N values fluctuated, but generally increased, from 61.5 to 91 feet bls through poorly graded sand and limestone, where the boring was terminated within refusal-strength limestone. Weight-of-hammer strength limestone was encountered from 75.5 to 77 feet bls. Rapid losses of drilling fluid circulation occurred at 27, 35, and 42.5 feet bls. However, advancing casing allowed drilling to be completed without borehole collapse. Based on the location of the boring relative to SB-15 and SB-17, where limestone was encountered at 2.5 and 16 feet bls, respectively, SB-16 is representative of a paleo-sinkhole feature within which materials have not had enough time to settle and consolidate over geologic time.

SB-35: SPT boring SB-35 was advanced in close proximity to the western edge of subsidence feature A. The formation of subsidence feature A is the evidence of sinkhole activity at this location. The N values in SPT boring SB-35 declined through poorly graded sand and clayey sand to approximately 9.5 feet bls, where clay was encountered. The N values then increased to 16.5 feet bls through clay and into limestone, which was encountered from 12.5 to 17 feet bls. A rapid loss of drilling fluid circulation occurred at 13.5 feet bls within limestone. The N values declined within an interbedded clay unit, encountered from 17 to 25 feet bls, before increasing again within a lower limestone unit, which was penetrated at 25 feet bls. A weight-of-hammer event within a seating interval occurred at 20 feet bls. The boring was terminated at 37 feet in strong limestone. SPT boring SB-35 was advanced in close proximity to the lowest point of Feature A, which was approximately 8 to 9 feet deep. The decline in N values in sandy soils is solely within backfilled material. The increase in N values at 11.5 feet in clay and then again at 16.5 feet in limestone indicates that the soils did not move vertically downward at this location, rather they had been transported laterally into the limestone.

SB-36: SPT boring SB-36 was advanced in close proximity to the eastern edge of subsidence feature A. The decline in N values accompanied by a total of 2.5 feet of weight of rod/hammer strength materials and a rapid loss of drilling circulation above the limestone, as well as the proximity to subsidence feature A, provide evidence for the existence of sinkhole activity in the immediate vicinity of SPT boring SB-36. The N values in SPT boring SB-36 fluctuated, but remained relatively consistent within poorly graded sand, silty sand, and clay to approximately 17.5 feet bls. The N values then declined through clay and clayey sand to the top of limestone, which was encountered at 25 feet bls. Weight-of-rod/hammer conditions were encountered from 19.5 to 22 feet bls. A rapid loss of drilling fluid circulation occurred at 20 feet bls. Below 25 feet bls, the N values fluctuated within a sequence of limestone and interbedded clay, including weight-of-rod strength material from 30 to 31.5 feet bls. The boring was terminated within stiff clay at 47 feet bls.

SB-37: SPT boring SB-37 was advanced in close proximity to the southeastern edge of subsidence feature D. The decline in N values accompanied by weight-of-rod/hammer strength materials, rapid losses of drilling circulation above the limestone, and proximity to subsidence features B and D are evidence that sinkhole activity exists in the immediate vicinity of SPT boring SB-37. After initially increasing to 3.5 feet bls, the N values in SPT boring SB-37generally declined and remained soft to very soft or very loose through poorly graded sand, silty sand, clay, and clayey sand to the top of limestone, which was encountered at 40 feet bls. This decline included weight-of-rod events from 20 to 22 feet bls and 25 to 26 feet bls and weight-of-hammer events from 6.5 to 7 feet bls, 16.5 to 17 feet bls, 25 to 25.5 feet bls and 36 to 36.5 feet bls. The N values fluctuated, but generally increased, through limestone and included weight-of-hammer strength material from 46.5 to 47 feet bls and weight-of-rod strength material from 50 to 51 feet bls. The boring was terminated within limestone at 62 feet bls. Rapid losses of drilling fluid circulation occurred at 15.5 and 34 feet bls; however, advancing casing during drilling allowed borehole completion without collapse.

SB-39: SPT boring SB-39 was advanced in close proximity to the southeastern edge of subsidence feature E and approximately five feet to the northwest of the edge of feature F. In SPT boring SB-39, the N values remained low through a stratigraphic sequence comprised of layers of poorly graded sand, silty sand, clay, and limestone to 20.5 feet bls. Limestone was consistently encountered below 20.5 feet bls, where N values fluctuated, but generally increased. Weight-of-hammer events occurred from six to eight feet bls, nine to 9.5 feet bls, 13 to 14 feet bls, 15.5 to 16 feet bls and 17 to 17.5 feet bls. Weight-of-rod events occurred from eight to 8.5 feet bls, within the seating interval, 14 to 15.5 feet bls, and 16 to 17 feet bls. Rapid losses of drilling fluid circulation occurred at 8 and 11 feet bls; however, advancing of casing allowed drilling to be completed without borehole collapse. SPT boring SB-39 was terminated in refusal strength limestone at 32 feet bls. Limestone was observed within two feet of the land surface on the sidewalls of subsidence feature F. The decline in N values accompanied by weight-of-rod/hammer strength materials, rapid losses of drilling circulation above the limestone, proximity to subsidence features E and F, and the difference in depth to limestone from what was observed approximately five to eight feet away; indicate that sinkhole activity exists in the vicinity of the boring. Limestone was identified in nearby SPT boring SB-38 at a depth of six feet bls and just a few inches under the surface on the sidewalls of Features N, Q, and O. These shallow limestone surfaces could represent pinnacles of limestone where sediments could potentially ravel if excessive stormwater loading occurs.

SB-40: SPT boring SB-40 was advanced in close proximity to the eastern edge of subsidence feature I. The systematic decline in N values accompanied by weight-of-rod/hammer strength material, a rapid loss of drilling circulation above the limestone, and proximity to subsidence feature I indicate that sinkhole activity exists in the immediate vicinity of SPT boring SB-40. Systematically declining N values were measured through poorly graded sand and clayey sand in SPT boring SB-40 from land surface to the top of limestone. The N-value decline included weight-of-rod/hammer events from 10 to 11 feet bls, 12.5 to 13 feet bls, and 14 to 17 feet bls. A rapid loss of drilling fluid circulation occurred at 13.5 feet bls. Limestone was encountered at 18 feet bls where the N values increased and then fluctuated through limestone and an infilled clay unit to the termination of the boring at 47 feet bls. A weight-of-rod event occurred within the infilled clay horizon within the seating interval at 35 feet bls.

SB-42: The systematic decline in N values in non-cohesive sandy soils accompanied by weight-of-hammer strength materials above the limestone and proximity to subsidence feature I provide evidence for the existence of sinkhole activity in the immediate vicinity of SPT boring SB-42. Systematically declining N values were measured in SPT boring SB-42. This decline in N values, which were through poorly graded sand to 9.5 feet bls, included weight-of-hammer strength materials from 6.5 to seven feet bls and 8.5 to 9.5 feet bls. Below 9.5 feet bls, the N values fluctuated, but generally increased through clay and limestone, which was penetrated at 17 feet bls. A weight-of-hammer event occurred within the seating interval at 15.5 feet bls within clay. A rapid loss of drilling fluid circulation occurred within limestone at 18 feet bls. The boring was terminated at 37 feet bls in refusal strength limestone.

SB-45: Systematically declining N values were measured in SPT boring SB-45 from approximately two feet bls to the top of limestone, which was encountered at 17 feet bls. This interval, which was through poorly graded sand and clay, included weight-of-rod/hammer events from 10 to 15 feet bls. The N values generally increased within limestone to the termination of the boring at 32 feet bls. Drilling fluid circulation was maintained while advancing the boring.

In summary, the SPT data indicate that both sinkhole development and sinkhole activity or the potential for future subsidence exists within a focused area of the south detention pond area. Sinkhole activity was identified through the presence of weakening of sediments with depth, which is indicative of raveling in SPT borings SB-16, SB-35, SB-36, SB-37, SB-39, SB-40 and SB-42 in the southern part of the southern detention pond in the vicinity of the Subsidence Event Area. SPT borings SB-35, SB-36, SB-37, SB-39, and SB-40 were in close proximity to the Subsidence Event Area. The limestone surface within the Subsidence Event Area is pinnacled and, in some areas, it crops out at the land surface.

Conditions in SPT boring SB-16, just northwest of the Subsidence Event Area, indicate that long-term settlement in the immediate vicinity of this boring would be likely, but slow to occur. This is the nearest location to the landfill cells where the potential for subsidence feature development was identified.

The potential of rapid development of a sinkhole near SB-42, which is north of the Subsidence Event Area, cannot be eliminated. While there was no rapid loss of circulation above the limestone surface and/or evidence of a large subsurface void within the limestone, the decline of N values within the weak material overlying limestone is indicative of sinkhole activity.

Sinkhole activity, or the potential for subsidence feature development, was also identified in SB-5, SB-11, and SB-45 in the northeastern corner of the southern detention pond. The locations of SPT SB-5, SB-11, and SB-45 correspond to the large GPR anomaly in the northeastern part of the site. Conditions in SPT borings SB-5 and SB-11 indicate that long-term settlement in the vicinity of these borings would be likely, but slow to occur, and rapid development of a sinkhole is unlikely. Like SB-42, the potential of rapid development of a sinkhole near SB-45 cannot be eliminated. There was no rapid loss of circulation above the limestone and or evidence of a large subsurface void in the close proximity to SB-45. Also, limestone is not present near land surface.

In addition, results of the investigation demonstrated that the larger sinkholes that developed in the Subsidence Event Area are clearly cover-collapse sinkholes formed by hydraulic loading in the stormwater pond during Tropical Storm Debby. The smaller, satellite sinkholes peripheral to the cover-collapse sinkholes are small suffosion sinks where sand raveled into pipes that lead to the main conduit of the cover-collapse sinks. Such satellite sinkholes are common around larger, cover collapse features.

Geotechnical, geophysical, and visual data collected as part of this investigation demonstrate that cover materials failed (collapsed) and the cover and overlying sediments were rapidly transported (raveled) into void space within the limestone in the southern stormwater detention pond. The cover failure in the south detention pond is most likely the result of the sudden and substantial loading of the stormwater pond as a result of rainfall events associated with Tropical Storm Debby. Once the cover materials failed, the large amount of water within the pond quickly emptied into the aquifer through the breach in the cover, transporting sediments into the void space within the limestone. This surge of sediment and water into the aquifer in turn created a localized, sudden change of the water pressure within the aquifer, which apparently induced additional and proximal cover collapses. The water collecting and migrating toward the cover failure piped through the sand resulting in the small, satellite, suffosion sinks.

Breaching of the cover in the Subsidence Event Area has allowed a substantial amount of sediment into the subsurface within the area of shallow, karstic limestone. As several high rainfall events occurred after the formation of the sinkhole features and progression or enlargement of the features was negligible, it is likely that a significant proportion of the available void space was filled as the features formed. Conduits into the limestone that were visible within the features were filled with CLSM. These filled features are unlikely to re-form as the CLSM and fill material has replaced the failed cover and filled any remaining open void space. There is no increased risk of subsidence under the landfill cells or for adverse impacts to groundwater quality as a result of the development of the subsidence features in the south detention pond.

Section 3

Method of Investigations

3.1 Electromagnetic Survey

The EM survey was performed using an EM31 Terrain Conductivity (Geonics Ltd.) meter. This meter is a non-contact means of determining the bulk ground electrical conductivity (inverse of electrical resistivity). The Trackmaker option was used to display a position grid on the instrument screen to ensure the operator maintained position along the lines at the surveyed transects.

Instrument calibration was checked on a daily basis using internal testing protocols defined by the manufacturer. Prior to use, the operator allowed the system to come to equilibrium by operating and observing stability of readings for a minimum 5-minute period before commencing data acquisition. Data were edited and geo-referenced using the Trackmaker software, and a conductivity contour map was prepared utilizing software program SURFER.

3.2 Ground Penetrating Radar Survey

A GPR survey was performed concurrently with completion of the geotechnical/geological control borings. Additional GPR transects were performed based on interpretations of geophysical and geotechnical data.

A Geophysical Survey Systems Inc. (GSSI) Model SIR2000 digital radar system with a 200 MHz dipole antenna and calibrated survey wheel was used as the data acquisition system. The antenna was towed behind a vehicle except where steep ground slopes of the berms caused safety issues. For such segments, the instrument was hand towed.

The operator established instrument record settings prior to commencing data acquisition by recording test profiles at several different range settings at several different locations across the Site to optimize recording of subsurface reflectors which may vary in depth from one portion of the Site to another. These locations were coordinated with the locations of geotechnical/geological control borings.

The survey wheel was calibrated prior to initial data acquisition. This was accomplished using the internal calibration protocol of the SIR2000 system along a measured distance along a line representative of the terrain over most of the property.

Data were initially acquired on the north-south transects. Data were then acquired on east-west transects. In-fill GPR lines were completed in the Subsidence Event Area to further define the observed anomalies.

3.3 Geotechnical Borings

Geotechnical/geological control soil borings, including standard penetration tests (SPTs), were completed to provide geotechnical and geological control for field interpretation of geophysical data.

Most soil borings were terminated approximately 10 feet below the surface of the limestone. Split spoon samples were collected continuously from most borings at the ends of the grid lines and from selected locations in the bottom of the pond. Where continuous sampling was not performed, split spoon samples were collected continuously from the upper 12 feet of soil and at five-foot intervals thereafter until total boring depth. SPTs/split spoon testing was performed in accordance with ASTM D 1586. Boreholes were advanced using mud rotary drilling. After completion, each boring was grouted to land surface using neat Portland Type II cement.

Section 4

Conclusions and Recommendations

4.1 Conclusions

The following conclusions are based on results of the assessment.

- From published data (Sinclair et al., 1985;Trommer, 1987; Fretwell, 1988; and SWFWMD, 1988) and site-specific data, the Site is located within an area of karst development. The general sediment profile at the Site consists of sand overlying clay-rich sediments with varying amounts of sand. Lateral variations in the nature and thicknesses of the geologic strata that comprise the cover are common.

- One northeast-southwest photolineament visible on the 1941 pre-development aerial photograph encroaches on the southern part of the south detention pond. However, no major photolineaments are evident in the western part of the south detention pond or in the vicinity of the landfill cells.

- The subsidence features in the Event Area are not all isolated, individual features. They reflect a network of drainage features associated with a smaller number of chimneys in the underlying limestone.

- Based on the data collected, it does not appear that the raveling conditions associated with the formation of the sinkhole features in the Subsidence Event Area extend to the west, toward the landfill.

- Sinkhole activity, or the potential for subsidence feature development, was also identified in SB-5, SB-11, and SB-45 in the northeastern corner of the southern detention pond. This area poses no risk to the landfill cells.

- The larger sinkholes that developed in the Subsidence Event Area are clearly cover-collapse sinkholes formed by hydraulic loading in the stormwater pond during Tropical Storm Debby.

- The subsidence features in and adjacent to the south detention pond formed due to hydraulic loading in an isolated part of the detention pond where limestone is present near the land surface.

- The smaller, satellite sinkholes peripheral to the cover-collapse sinkholes are small suffosion sinks where sand raveled into pipes that lead to the main conduiting of the cover-collapse sinks. Such satellite sinkholes are common around larger, cover collapse features.

- Breaching of the cover in the Event Area has allowed a substantial amount of sediment into the subsurface within the area of shallow, karstic limestone. Conduits into the limestone that were visible within the features were filled with CLSM. These filled features are unlikely to re-form as the CLSM has replaced the failed cover and filled any remaining open void space.

- There is no increased risk of subsidence under the landfill cells or for adverse impacts to groundwater quality as a result of the development of the subsidence features in the south detention pond.

4.2 Recommendations

The following recommendations are based on results of the assessment:

- Neither additional investigation nor remedial or preventative measures are warranted. However, securing the area around the event area is recommended to mitigate the potential for injury in the unlikely event of additional subsidence.
- If the areas continue to subside, additional fill should be placed in the depressions to prevent ponding of rain water.

Section 5

References

American Society of Testing and Materials, 2012. *ASTM Designation D 1586 – 99: Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils.* Reprinted from the Annual Book of ASTM Standards.

Arthur, J.D., Fischler, C., Kromhout, C., Clayton, J.M. Kelley, G.M., Lee, R.A., Li, L., O'Sullivan, M., Green, R.C., and Werner, C.L., 2008, Hydrogeologic Framework of the Southwest Florida Water Management District, Florida Geological Survey, Bulletin 68, Tallahassee, Florida

Fretwell, J.D. 1988. *Water Resources and Effects of Ground-Water Development in Pasco County, Florida*, Water-Resources Investigations Report 87-4188, U.S. Geological Survey, Tallahassee, Florida.

Miller, J.A. 1986. *Hydrogeologic Framework of the Floridan Aquifer System in Florida and in Parts of Georgia, Alabama and South Carolina*, U.S. Geological Survey Professional Paper 1403-B.

Ortiz, A.G. 2011. *Potentiometric Surface of the Upper Floridan Aquifer, West-Central, Florida*, September 2010, Scientific Investigations Map 3148, USGS.

Ortiz, A.G. 2009. *Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida*, May 2009, Scientific Investigations Map 3093, USGS.

Ortiz, A.G. 2009. *Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida*, September 2008, Scientific Investigations Map 3071, USGS.

Ortiz, A.G. 2008. *Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida,* May 2008, Scientific Investigations Map 3057, USGS.

Ortiz, A.G. 2007. *Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida,* September 2007, Scientific Investigations Map, USGS, Open-File Report 2008-1105.

Ortiz, A.G. 2007. *Potentiometric Surface of the Upper Floridan Aquifer, West-Central, Florida*, May 2007, Scientific Investigations Map, USGS, Open-File Report 2007-1380.

Scott, T.M. 2001. Geologic Map of Florida, Open-File Report 80, Florida Geological Survey, Tallahassee, Florida, ISSN 1058-1391.

Sinclair, W.C., Stewart, J.W., Knutilla, R.L., Gilboy, A.E., and R.L. Miller, 1985. *Types, Features and Occurrence of Sinkholes in the Karst Area of West-Central Florida.* U.S. Geological Survey Water Resources Investigations Report 85-4126.

Southwest Florida Water Management District, 1988. *Groundwater Resource Availability Inventory: Pasco County, Florida.*

Trommer, J., 1987. *Potential for Pollution of the Upper Floridan Aquifer from Five Sinkholes and an Internally Drained Basin in West-Central Florida.* U.S. Geological Survey Water Resources Investigations Report 87-4013.

Vecchioli, J., and the Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition. 1986. *Hydrogeological Units of Florida.* Florida Geological Survey, Special Publication No. 28, Tallahassee, Florida.

White, W.A. 1970. *The Geomorphology of the Florida Peninsula: Florida Department of Natural Resources.* Bureau of Geology Geological Bulletin, No. 51

Appendix A

Approved Work Plan

Pasco County Utilities

West Pasco Resource Recovery Facility South Stormwater Detention Pond Subsidence Feature Assessment Work Plan

October 2012

10/9/12

William T. Beeson, P.G.
Florida Professional Geologist No. 1214

CDM Smith

1715 North Westshore Blvd., Suite 875

Tampa, FL 33607

West Pasco

Assessment Work Plan

Introduction

As a result of heavy rain associated with Tropical Storm Debby, subsidence features formed in and around the southwestern part south stormwater detention pond east of Cell A-3 at the West Pasco Class I Landfill on June 26, 2012. The Florida Department of Environmental Protection (FDEP) was notified of the occurrence of the subsidence features and inspected the facility on June 27, 2012. Representatives of Pasco County and CDM Smith met with FDEP at the site on June 27, 2012. In addition to requiring Pasco County to take immediate actions to mitigate the potential for future subsidence, FDEP requested that Pasco County develop a work plan for geological, geotechnical and geophysical investigations of the stormwater detention ponds.

The following plan for assessment of the south stormwater detention pond is submitted in accordance with the FDEP request and subsequent conversations with representatives of FDEP. A plan for assessing the potential for the occurrence of subsidence features in and around the north stormwater detention pond will be provided if results of the south detention pond assessment indicate that the potential for subsidence to the north exists.

The objectives of the assessment are to evaluate the potential for additional geologic activity to occur in and around the south detention pond and to obtain sufficient information to develop plans to remediate the existing subsidence features in the south detention pond and to mitigate potential risks to the landfill. The assessment will include five tasks. These are:

- Task 1 – Establish the site grid and coordinate system,
- Task 2 – Electromagnetic (EM) survey,
- Task 3 – Geotechnical/geological control borings,
- Task 4 – Ground penetrating radar (GPR) survey, and,
- Task 5 – Geotechnical/geological investigations of existing subsidence features.

Results of the assessment will be presented in a brief report. The report will include a discussion of the results with respect to available information regarding the local and regional hydrogeology, an evaluation of potential risks for future subsidence that may adversely impact adjacent landfill cells, a focused feasibility analysis of potential remedial action strategies, remedial action plans for implementing the most cost-effective remedial action strategy, and a schedule for implementing the remedial action plans.

The assessment will be initiated upon receipt of approval of the work plan by FDEP and after the subsidence features have been filled and the security fence has been removed. Completion of the assessment and submittal of the report and remedial action plans is expected to take approximately three months.

Task 1 – Establish Site Grid and Coordinate System

A grid with 50-foot centers will be established in and adjacent to the south stormwater detention pond. The grid lines will have a true (State Plane Coordinate System) orientation of due North-South and due East-West. All data generated during the geophysical and geotechnical testing will be geo-referenced to the site and/or State Plane geographic coordinate system.

Grid nodes will be staked every 200 feet around the perimeter of the grid system and at 100-foot intervals along the northern and southern boundaries of the pond at the base of the berm. In the northern part of the pond, nodes will be staked at 200-foot intervals from north to south and at 100-foot intervals from east to west. Grid nodes will be staked at 100-foot intervals in the southern part of the pond. The nodes that are staked may be revised pending field conditions. Each stake will be marked with the appropriate site coordinates. Selected stakes will also be marked with the land surface elevation. Approximate locations of the grid and staked nodes are shown on **Figure 1**.

Task 2 – Electromagnetic Survey

The EM survey will be performed using an EM31 Terrain Conductivity (Geonics Ltd.) meter. This meter is a non-contact means of determining the bulk ground electrical conductivity (inverse of electrical resistivity). The instrument is a man-portable device with an integrated GPS location system (Trackmaker Option) that will determine the bulk conductivity to a depth of approximately 16 feet below land surface with readings (conductivity and latitude/longitude) being taken on one-second intervals as the operator walks along the grid of transect lines. The Trackmaker option displays a position grid on the instrument screen to ensure the operator maintains position along the lines at the (approximate) desired line spacing. Recording conductivity and positioning data in one file enables production of conductivity contour maps for detection of anomalous areas that may be associated with subsidence features.

The operator will check instrument calibration on a daily basis using internal testing protocols defined by the manufacturer. The operator will allow the system to come to equilibrium by operating and observing stability of readings for a minimum 5-minute period before commencing data acquisition.

Data will be acquired on a series of parallel north-south transects having maximum length of 950 feet and an inter-line spacing (optimal) of 50 feet. Acquisition will proceed by starting in the SW corner of the grid and proceeding north along the westernmost line. Acquisition will be paused at the northern end of the line, and the operator will move to the northern end of the second line and begin acquisition of the second line proceeding to the south. This zig-zag acquisition pattern will be continued until all north-south grid lines have been acquired. Additional in-fill EM survey lines of appropriate length to further define the observed anomalies

Data will be edited and geo-referenced using the Trackmaker software, and a conductivity contour map will be prepared utilizing the SURFER software program. It may be necessary to convert the internal GPS positioning format to Florida State Plane coordinates prior to final map generation.

Task 3 – Geotechnical/Geological Control Borings

Prior to the performance of the ground penetrating radar (GPR) survey, geotechnical/geological control soil borings, including standard penetration tests (SPTs), will be completed to provide geotechnical and geological control for field interpretation of geophysical data. Figure 1 shows the proposed locations of 24 control borings. As shown on Figure 1, the control borings are more tightly spaced in the southern part of the pond in the vicinity of the subsidence features. Locations of the geotechnical/geological control borings may be modified based on results of the EM survey or other site conditions.

Each soil boring will be terminated approximately 10 feet below the surface of competent rock. Split spoon samples will be collected continuously from borings at the ends of the grid lines and from selected locations in the bottom of the pond. Where continuous sampling is not performed, split spoon samples will be collected continuously from the upper 10 feet of soil and at five-foot intervals thereafter until refusal. SPTs/split spoon testing will be performed in accordance with ASTM D 1586. If split-spoon samples cannot be collected, then drill cuttings will be described. Boreholes will be advanced using hollow stem augers or, if necessary, rotary drilling methods.

If results of SPTs indicate that soft or incompetent materials are present in the subsurface, then additional testing using a flat dilatometer may be performed. Flat Dilatometer testing (ASTM D6635) may be utilized to investigate the strength and compressibility of selected zones that exhibit negligible Standard Penetration Resistance. The Flat Dilatometer test is a refined tool that enables better characterization of such zones and to distinguish between strata that may simply be weak or less consolidated versus cavity or raveling zones that would have an elevated potential for subsidence.

After completion, each boring will be grouted to land surface using neat Portland Type II cement. All drilling and sampling will be supervised by a qualified geologist or engineer.

Task 4 – Ground Penetrating Radar Survey

A GPR survey will be performed after most of the geotechnical/geological control borings have been completed. A Geophysical Survey Systems Inc. (GSSI) Model SIR2000 digital radar system with a 200 MHz dipole antenna and calibrated survey wheel as the data acquisition system will be used. The antenna will be towed behind a vehicle except where steep ground slopes of the berms cause safety issues. For such segments, the instrument will be hand towed.

The operator will establish instrument record settings prior to commencing data acquisition by recording test profiles at several different range settings (e.g. 100 ns, 150 ns, and 200 ns) at several different locations across the property to optimize recording of subsurface reflectors which may vary in depth from one portion of the site to another. These locations will be coordinated with the locations of geotechnical/geological control borings.

The survey wheel will be calibrated prior to initial data acquisition. This will be accomplished using the internal calibration protocol of the SIR2000 system along a measured distance along a line representative of the terrain over most of the property. Calibration line length must be at least 700 feet in length.

Data will be initially acquired on the north-south transects (see Figure 1). Data will then be acquired on east-west transects. Acquisition will proceed by starting in the SW corner of the grid and proceeding north along the westernmost line. Acquisition will be closed at the northern end of the line, and the operator will move to the northern end of the second line and begin acquisition of the second line proceeding to the south. This zig-zag acquisition pattern will be continued until all north-south grid lines have been acquired. The GPR crew will then start on a similar acquisition scheme for the staked east-west lines. Note that at any time during data acquisition anomalous subsurface conditions may be observed on the gridded GPR profiles. The crew chief will mark (as possible) the approximate locations of such anomalies and add in-fill GPR lines of appropriate length to further define the observed anomalies. SPT borings, and if appropriate, flat dilatometer testing, will be performed at the locations of anomalies to confirm GPR data.

GPR profiles will be in final form for analysis without further data processing steps. Data will be analyzed and georeferenced using the surveyed grid and stake coordinates as measured by others. A final GPR anomaly map will be prepared based on analysis of the GPR profiles.

Task 5 – Geotechnical/Geological Investigations of Existing Subsidence Features

SPT borings will be performed in and in the immediate vicinity of the existing subsidence features in the south detention pond. In addition to the approximate centers of the largest subsidence features that are accessible for the drilling rig, other locations in the immediate vicinities of the subsidence features will be selected based on results of the GPR and EM surveys. Borings and testing will be performed as described in described in Task 2. If possible, continuous split-spoon sampling will be performed. If split-spoon samples cannot be collected, then drill cuttings will be described. A light, track-mounted drill unit (Diedrich D-25) will be used in and in the vicinity of the subsidence features. This rig is capable of drilling at least 100 ft.

DATE: Oct 17, 2012 3:23pm

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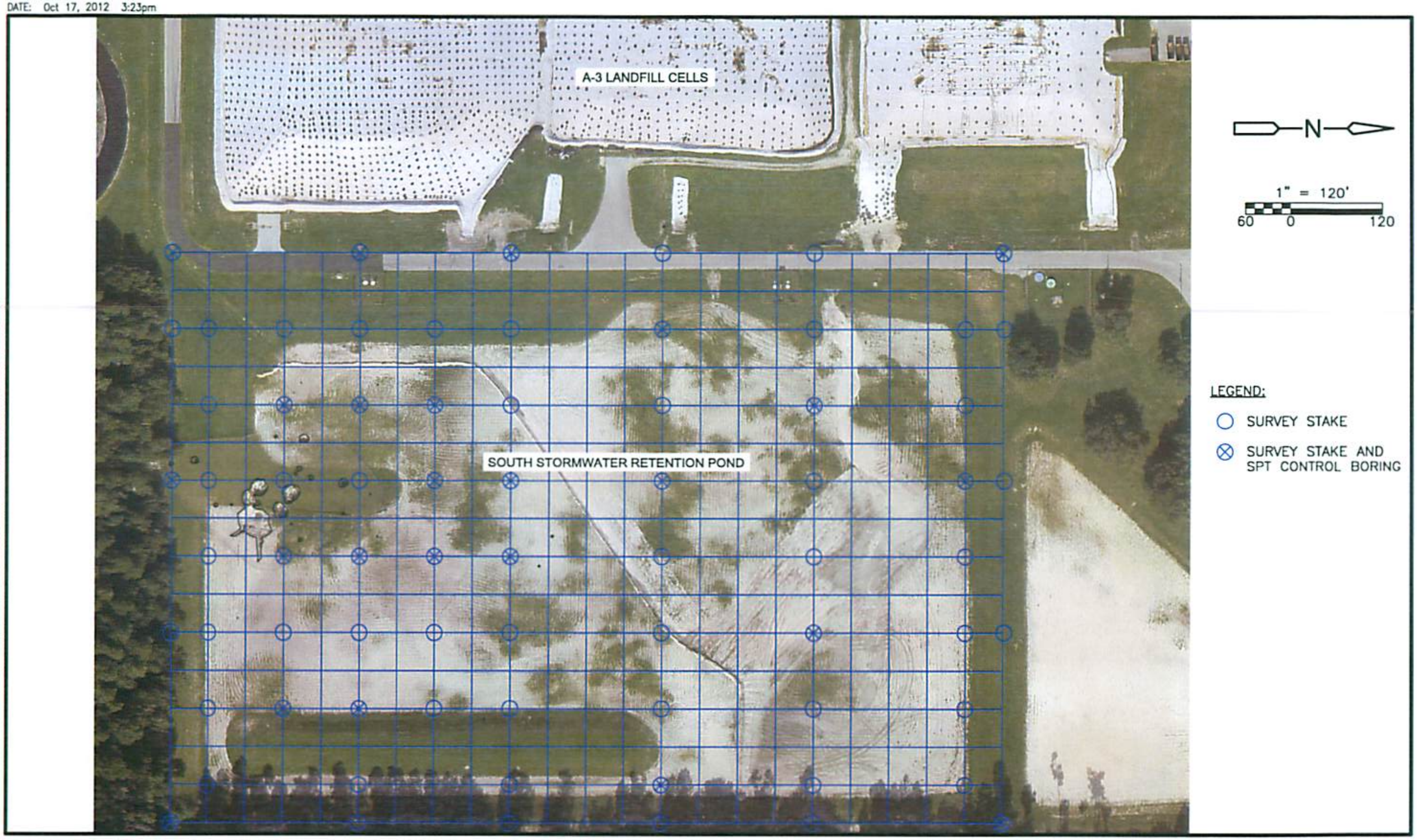
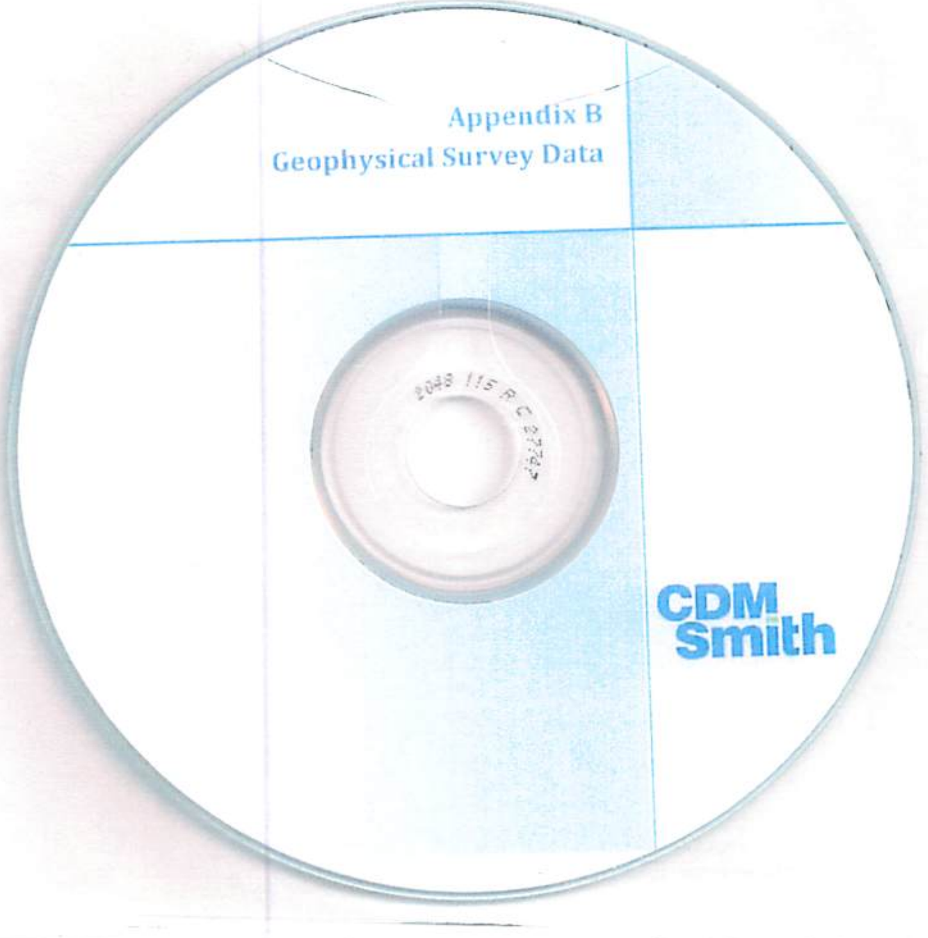


CDM Smith

Figure No. 1
West Pasco Resource Recovery Facility
South Detention Pond Grid and Control Locations

Appendix B

Geophysical Survey Data



Appendix B
Geophysical Survey Data

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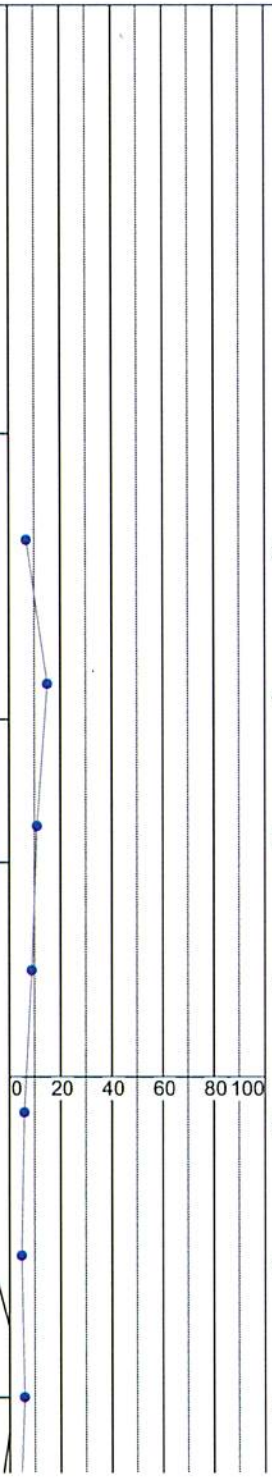
Appendix C

Boring Logs



DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Light-brownish-gray (10YR 6/2) fine to medium quartz sand Hand augered from 0-6 ft.				Hand auger boring from 0-6 ft.
5					
	POORLY GRADED SAND (SP): Loose to medium dense Light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 6-10 ft.				NoEV from 6 ft. to end of boring
		2/3/4/5	7		EFR @ 6 ft. @ 12 gpm
		4/6/9/12	15		
10	CLAY (CL/CH): Stiff Sandy clay Spooned from 10-12 ft.				Casing set to 10 ft. when at 12 ft.
		5/5/6/7	11		
	CLAY (CL/CH): Soft to stiff Mottled greenish-gray (5G 5/1) and yellow (10YR 7/6) clay Spooned from 12-18.5 ft.				
		2/4/5/7	9		
15					Casing set to 15 ft. when at 18 ft.
		3/3/3/5	6		
		2/2/3/5	5		
	CLAY (CL/CH): Medium stiff Light-yellowish-brown (10YR 6/4) calcareous clay Spooned from 18.5-19 ft.				
		3/4/2/4	6		
20	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay				

CDM Smith
Tampa, Florida

SPT BORING LOG

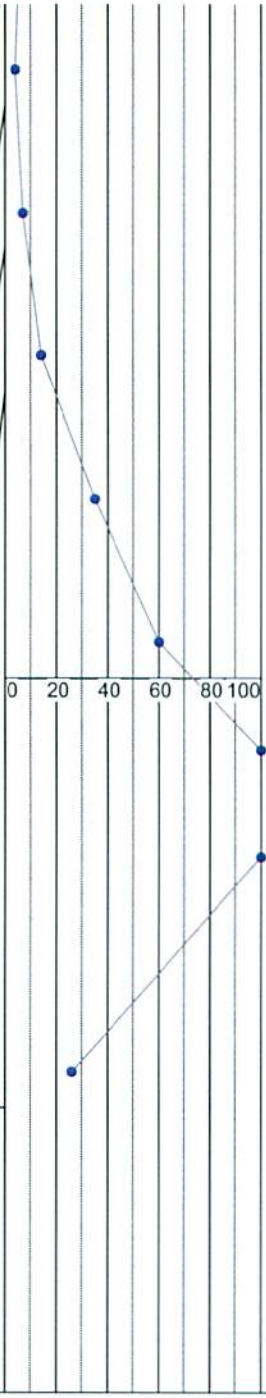
SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

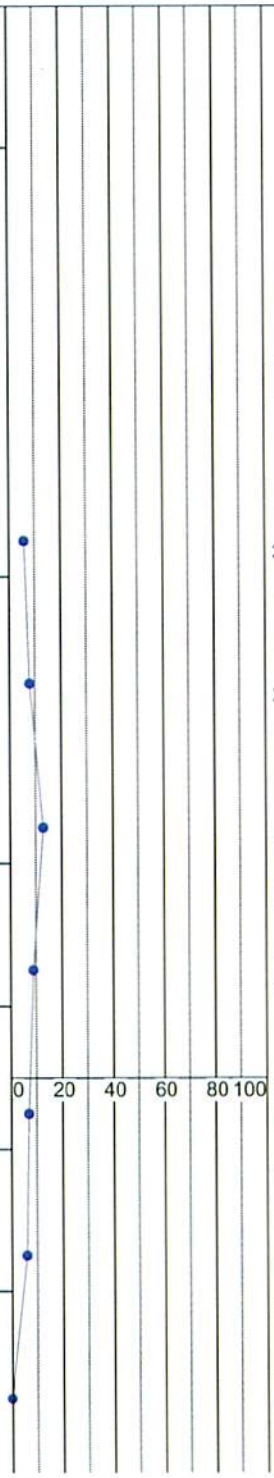
PROJECT NO: 8053622
BORING DATE: 11/07/12
PAGE NO: 1 of 2

BORING
SB-1

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Spooned from 19.5-20 ft.					
	CLAY (CL/CH): Soft Mottled brownish-yellow (10YR 6/6) and yellow (10YR 7/6) calcareous clay with limestone fragments Spooned from 20-22 ft.		2/2/2/5	4		
	CLAY (CL/CH): Medium stiff Mottled very-pale-brown (10YR 8/2) and light-greenish-gray (5G 7/1) sandy clay Spooned from 22-24 ft.		3/4/3/6	7		RLOC @ 23 ft. DB from 23 ft. to end of boring
25	CLAY (CL/CH): Stiff Mottled very-pale-brown (10YR 8/2) and brownish-yellow (10YR 6/6) calcareous clay with limestone fragments Spooned from 24-26 ft.		3/6/8/18	14		
	LIMESTONE: Strong to extremely strong Very-pale-brown (10YR 8/2) limestone; mottled with Brownish-yellow (10YR 6/6) from 26-31 ft. and 33-36 ft. Spooned from 26-36 ft.		17/18/17/11	35		
			3/12/48/50+	60		50 blows for 5 inches of penetration @ 29.5 ft.
30						Casing set to 30 ft. when at 30 ft.
			26/50+	100+		50 blows for 5 inches of penetration @ 30.5 ft.
			50+	100+		Drilled hard from 31-33 ft. 50 blows for 4 inches of penetration @ 32 ft.
35			4/14/12/8	26		TOB @ 36 ft. bls. Grouted borehole
40						



CDM Smith Tampa, Florida		SPT BORING LOG		
		SITE NAME: PCRRF - South Stormwater Pond SITE LOCATION: Spring Hill, Florida		
		DESIGNED BY: DR CHECKED BY: JMW DRAWN BY: MVK	PROJECT NO: 8053622 BORING DATE: 11/07/12 PAGE NO: 2 of 2	BORING SB-1



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Brown (10YR 5/3) fine to medium quartz sand with limestone gravel Hand augered from 0-2 ft.					Hand auger boring from 0-6 ft.
5	POORLY GRADED SAND (SP): Loose Light-gray (10YR 7/2) fine to medium quartz sand; mottled with grayish-brown (10YR 5/2) from 3.75-4 ft. Hand augered from 0-6 ft., spooned from 6-8 ft.		3/3/3/4	6		NoEV from 6-18 ft. EFR @ 6 ft. @ 12 gpm
10	SILTY SAND (SM): Loose to medium dense Light-brownish-gray (10YR 6/2) silty fine to medium quartz sand Spooned from 8-12 ft.		2/3/5/7 5/6/7/9	8 13		
	CLAYEY SAND (SC): Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 12-14 ft.		4/4/5/6	9		
15	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and light-gray (10YR 7/2) sandy clay Spooned from 14-16 ft.		3/3/4/5	7		Casing set to 15 ft. when at 16 ft.
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) clay and brownish-yellow (10YR 6/6) Spooned from 16-18 ft.		2/3/3/2	6		RLOC @ 18 ft.
20	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and brown (10YR 5/3) sandy clay with limestone gravel from 21.5-22 ft. Spooned from 18-22 ft.		WOH/WOH/WOH/ WOH	WOH		FAS/WOH from 18-20 ft. FAS/WOR from 20-21 ft., then SLO/WOH from 21-21.5 ft.

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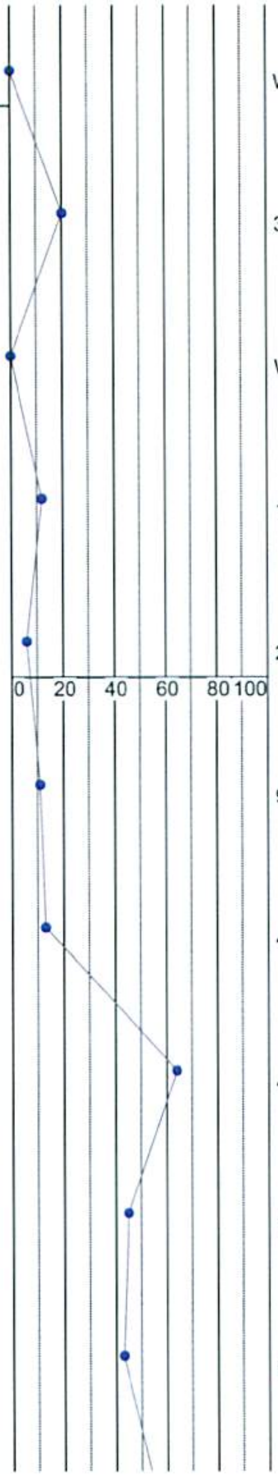
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/06/12	SB-2
DRAWN BY:	MVK	PAGE NO:	1 of 3	

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
		WOR/WOR/WOH/4	WOH	Casing set to 20 ft. when at 22 ft.
	LIMESTONE: Weak to extremely strong Very-pale-brown (10YR 8/2) limestone Spooned from 22-43.5 ft.			NoEV @ 22 ft.
		38/11/9/6	20	Drilled hard from 22-24 ft.
				FAS/WOH from 24-25.5 ft.
25		WOH/WOH/WOH/4	WOH	DB from 26 ft. to end of boring
				Drilled hard from 26-30 ft.
		1/8/4/5	12	NoEV from 26 ft. to end of boring
		2/2/4/9	6	
30		9/5/6/4	11	
		4/6/7/5	13	Drilled hard from 34 ft. to end of boring
35		4/20/44/34	64	
		16/22/23/19	45	
		9/19/24/32	43	
40				

PENETRATION
blows per foot



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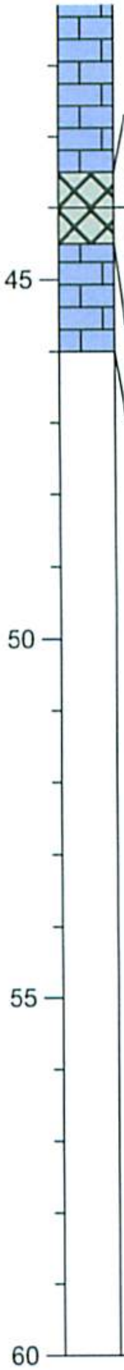
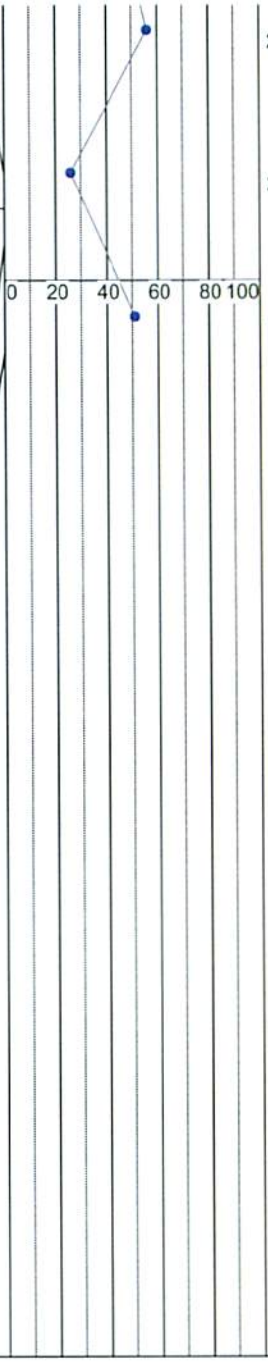
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/06/12	SB-2
DRAWN BY:	MVK	PAGE NO:	2 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			24/26/30/32	56		
	CLAY (CL/CH): Light-greenish-gray (5G 7/1) clay Spooned from 43.5-44 ft.		21/18/8/7	26		
45	CLAY (CL/CH): White (10YR 8/1) calcareous clay with limestone granules Spooned from 44-44.5 ft.					
	LIMESTONE: Extremely strong White (10YR 8/1) limestone Spooned from 44.5-46 ft.		16/17/34/44	51		TOB @ 46 ft. bls. Grouted borehole
50						
55						
60						



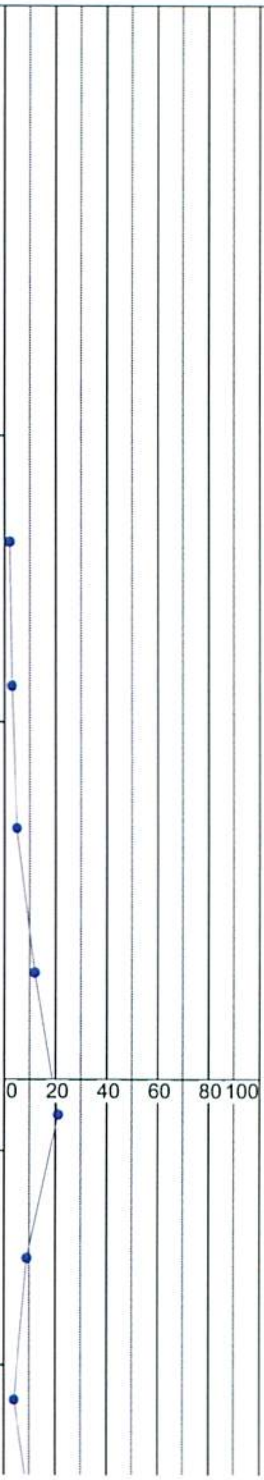


CDM Smith **Tampa, Florida**		**SPT BORING LOG**

SITE NAME: **PCRRF - South Stormwater Pond**
SITE LOCATION: **Spring Hill, Florida**

DESIGNED BY:	**DR**	**PROJECT NO:**	**8053622**	**BORING**
CHECKED BY:	**JMW**	**BORING DATE:**	**11/06/12**	**SB-2**
DRAWN BY:	**MVK**	**PAGE NO:**	**3 of 3**	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Light-brownish-gray (10YR 6/2) fine to medium quartz sand Hand augered from 0-6 ft.					Hand auger boring from 0-6 ft.
5						NoEV from 4 ft. to end of boring
	SILTY SAND (SM): Very loose Light-brownish-gray (10YR 6/2) silty fine to medium quartz sand, mottled with grayish-brown (10YR 5/2) from 8-10 ft. Spooned from 6-10 ft.					EFR @ 6 ft. @ 12 gpm
			1/1/1/1	2		
			1/1/2/2	3		
10	POORLY GRADED SAND (SP): Loose to medium dense Gray (10YR 6/1) fine to medium quartz sand, mottled with brown (10YR 5/3) from 10-12 ft. Spooned from 10-16 ft.					
			2/2/3/6	5		
			3/6/6/10	12		
15			5/8/13/15	21		Casing set to 15 ft. when at 16 ft.
	CLAY (CL/CH): Stiff Mottled gray (10YR 6/1) and brownish-yellow (10YR 6/6) clay Spooned from 16-19 ft.					
			5/5/4/5	9		MRR from 18-19 ft.
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and light-gray (10YR 7/1) clay with limestone gravel					RLOC @ 19 ft.
20			2/2/2/5	4		Casing set to 20 ft. when at 20 ft.



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/07/12	SB-3
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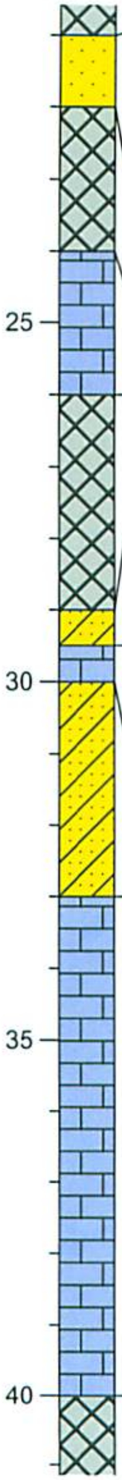

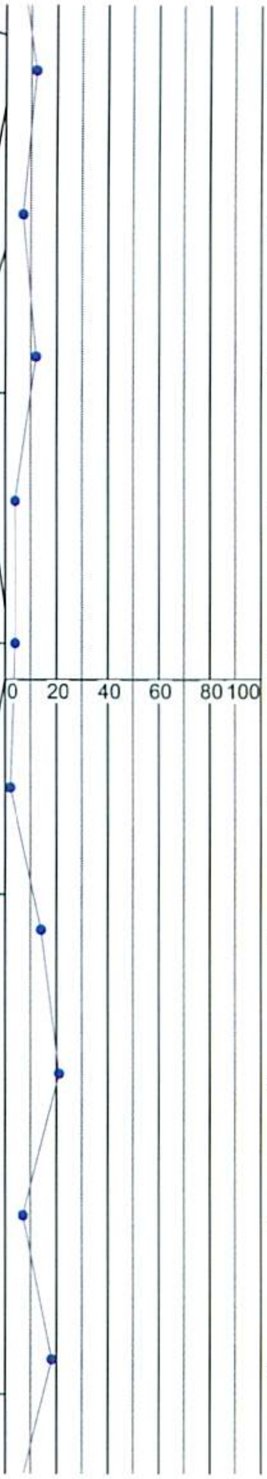

DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
Spooned from 19-21 ft.				
POORLY GRADED SAND (SP): Mottled gray (10YR 6/1) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 21-22 ft.	5/7/5/7	12		EFR @ 20 ft. @ 12 gpm
CLAY (CL/CH): Medium stiff Light-greenish-gray (5G 7/1) clay with limestone gravel Spooned from 22-24 ft.	2/4/3/2	7		
LIMESTONE: Moderately strong White (10YR 8/1) limestone Spooned from 24-26 ft.	5/8/4/5	12		
CLAY (CL/CH): Soft Mottled light-greenish-gray (5G 7/1) and brownish-yellow (10YR 6/6) clay Spooned from 26-29 ft.	2/2/2/1	4		RLOC @ 26 ft.
CLAYEY SAND (SC): Pale-brown (10YR 6/3) clayey fine to medium quartz sand Spooned from 29-29.5 ft.				DB from 29-42 ft.
LIMESTONE: White (10YR 8/1) limestone Spooned from 29.5-30 ft.	2/2/2/3	4		
CLAYEY SAND (SC): Very loose Light-brownish-gray (10YR 6/2) Spooned from 30-33 ft.	2/1/1/1	2		
LIMESTONE: Moderately strong to strong White (10YR 8/1) limestone Spooned from 33-40 ft.	2/4/10/18	14		
	5/9/12/6	21		
	6/4/3/5	7		
	5/6/12/6	18		
CLAY (CL/CH): Medium stiff to very stiff Mottled light-greenish-gray (5G 7/1)				

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SDII GLOBAL

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/07/12	SB-3
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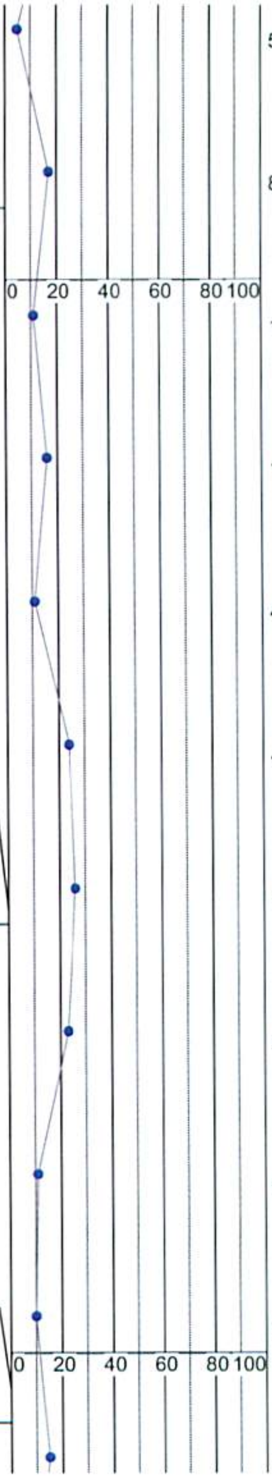

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	and yellow (10YR 7/6) clay with limestone gravel from 42.5-43 ft. Spooned from 40-44 ft.		5/2/3/7	5		EFR @ 42 ft. @ 12 gpm RLOC @ 42 ft.
			8/11/6/12	17		DB from 42 ft. to end of boring
45	LIMESTONE: Moderately strong to strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 45-52 ft. Spooned from 44-53.8 ft.		13/8/3/10	11		
			13/9/7/7	16		
50			4/7/4/5	11		
			4/8/16/18	24		
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 53.8-54 ft.		12/13/13/5	26		
55	LIMESTONE: Moderately strong to strong White (10YR 8/1) limestone Spooned from 54-60-5 ft.		9/12/11/7	23		
			8/5/6/15	11		
60	POORLY GRADED SAND (SP): Light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 60.5-61 ft.		4/3/7/9	10		
	LIMESTONE: Moderately strong to strong		1/5/10/13	15		

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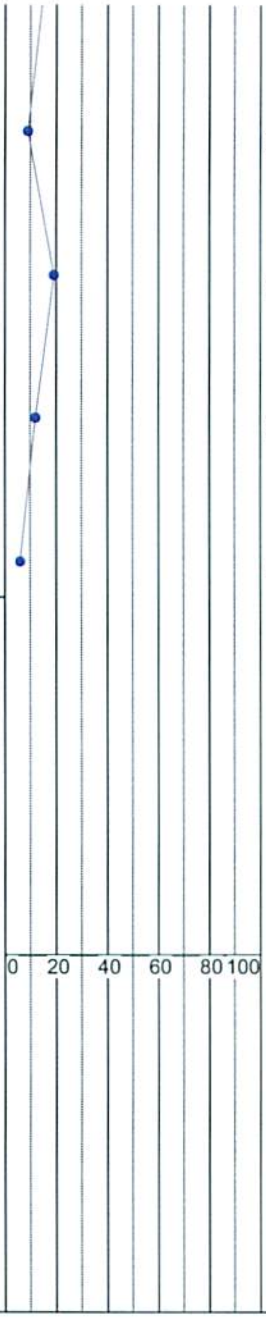
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/07/12	SB-3
DRAWN BY:	MVK	PAGE NO:	3 of 4	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	White (10YR 8/1) limestone Spooned from 61-70 ft.					
			6/5/4/7	9		
						Casing set to 50 ft. when at 64 ft.
65						
			2/10/9/6	19		
			3/6/6/5	12		
			4/3/3/7	6		
70						
						TOB @ 70 ft. bls.
						Grouted borehole
75						
80						

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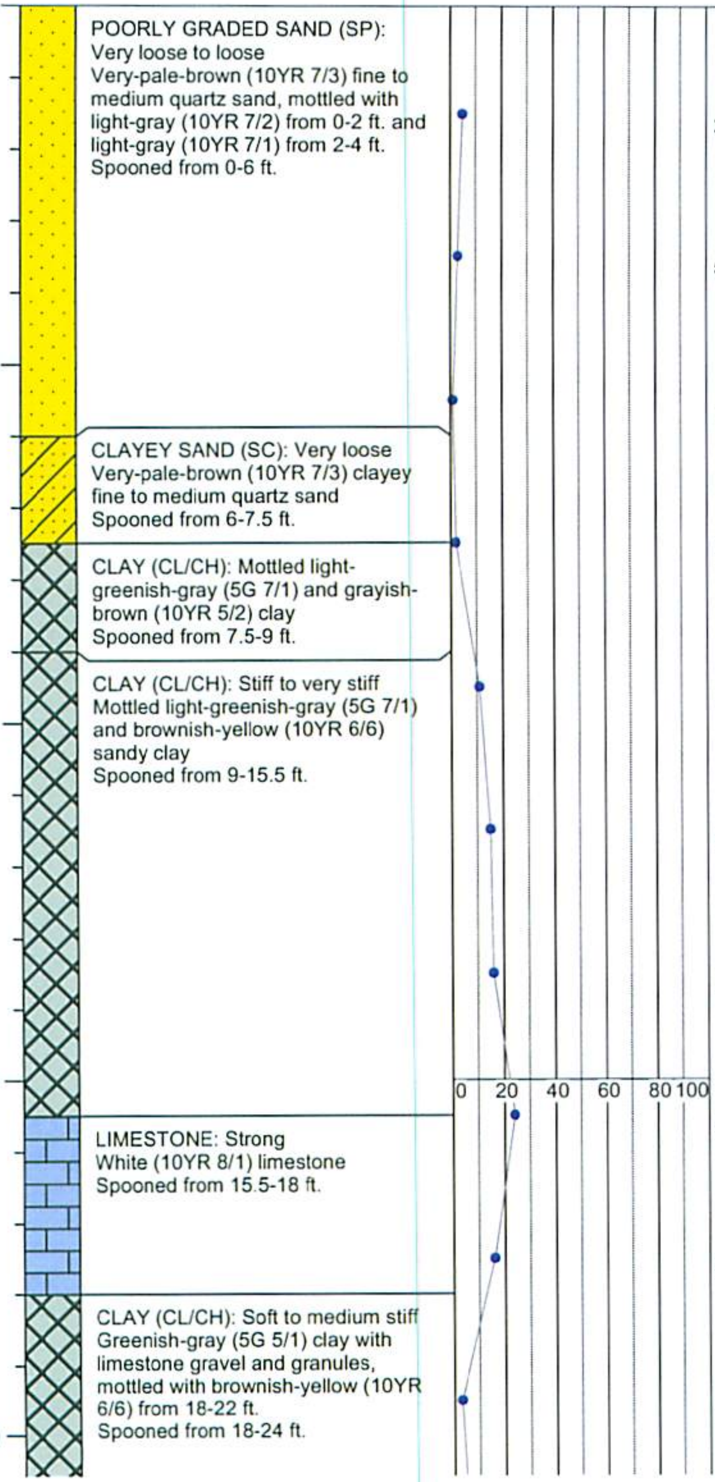
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/07/12	SB-3
DRAWN BY:	MVK	PAGE NO:	4 of 4	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Very loose to loose Very-pale-brown (10YR 7/3) fine to medium quartz sand, mottled with light-gray (10YR 7/2) from 0-2 ft. and light-gray (10YR 7/1) from 2-4 ft. Spooned from 0-6 ft.					NoEV from 0-4 ft.
			2/2/3/4	5		EFR @ 2 ft. @ 12 gpm
			5/1/2/2	3		FAS/WOH from 4.5-5 ft.
5			1/WOH/1/1	1		
	CLAYEY SAND (SC): Very loose Very-pale-brown (10YR 7/3) clayey fine to medium quartz sand Spooned from 6-7.5 ft.					NoEV from 6-26 ft.
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and grayish-brown (10YR 5/2) clay Spooned from 7.5-9 ft.		1/1/1/2	2		
	CLAY (CL/CH): Stiff to very stiff Mottled light-greenish-gray (5G 7/1) and brownish-yellow (10YR 6/6) sandy clay Spooned from 9-15.5 ft.		1/2/9/16	11		
10						Casing set to 10 ft. when at 12 ft.
			4/6/9/7	15		
			2/6/10/5	16		
15						Drilled hard from 15-16 ft.
	LIMESTONE: Strong White (10YR 8/1) limestone Spooned from 15.5-18 ft.		2/3/21/50+	24		
						RLOC @ 16 ft.
			23/11/5/4	16		DB from 16 ft. to end of boring
	CLAY (CL/CH): Soft to medium stiff Greenish-gray (5G 5/1) clay with limestone gravel and granules, mottled with brownish-yellow (10YR 6/6) from 18-22 ft. Spooned from 18-24 ft.					
20			2/1/2/4	3		

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/07/12	SB-4
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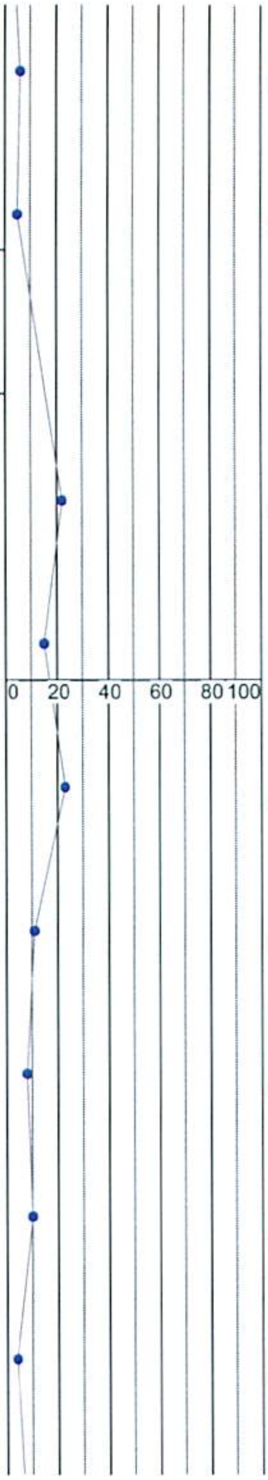
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			1/3/3/1	6		
			3/3/2/6	5		
25	NO RECOVERY: Drilled without sampling from 24-26 ft.					Drilled without SPT sampling from 24-26 ft.
	LIMESTONE: Weak to extremely strong Very-pale-brown (10YR 8/2) limestone, mottled with yellow (10YR 7/6) from 32-40 ft. Spooned from 26-52 ft.					FAS/WOH from 26-26.5 ft.
			WOH/3/19/14	22		NoEV from 28 ft. to end of boring
			10/9/6/12	15		
30						
			8/12/11/16	23		
			3/4/7/5	11		
35			3/1/7/6	8		
			5/4/6/4	10		
			3/2/2/3	4		
40						



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/07/12	SB-4
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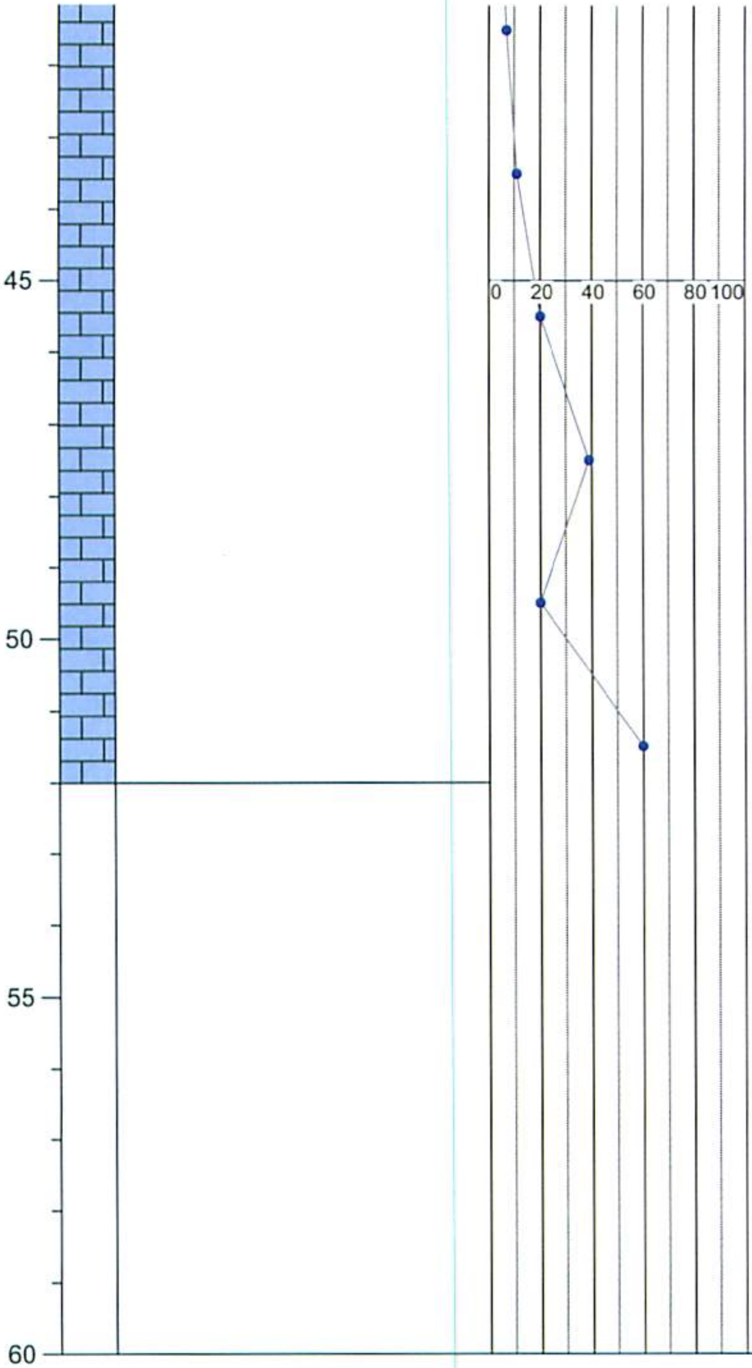

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			4/1/6/8	7		
			9/6/5/7	11		
			7/6/14/12	20		
			13/15/24/10	39		Drilled hard from 47 ft. to end of boring
			11/13/7/17	20		
			16/33/27/47	60		
						TOB @ 52 ft. bls.
						Grouted borehole

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING	
CHECKED BY:	JMW	BORING DATE:	11/07/12	SB-4	
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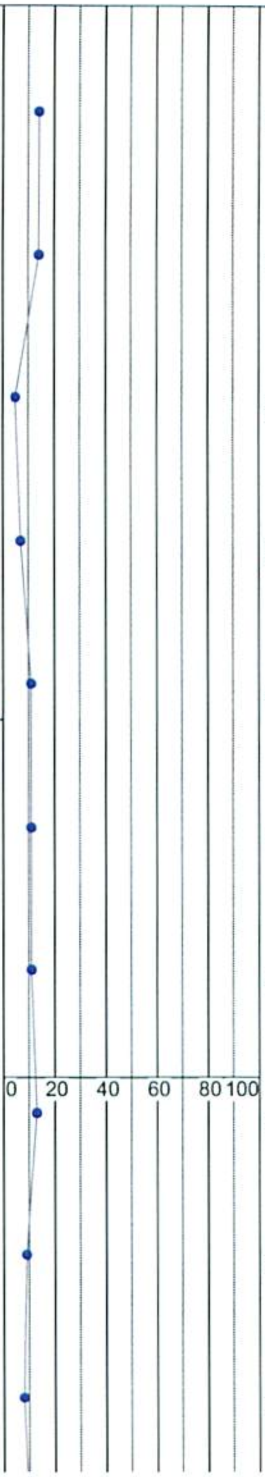
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Mottled grayish-brown (10YR 5/2) and light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 0-10 ft.					NoEV from 0-30 ft. Drilled soft from 0-78 ft. EFR @ 2 ft. @ 12 gpm
			2/5/9/12	14		
			7/7/7/6	14		
5			3/2/3/3	5		
			3/3/4/5	7		
			4/5/6/6	11		
10	POORLY GRADED SAND (SP): Very loose to medium dense Light-gray (10YR 7/2) fine to medium quartz sand, mottled with light-yellowish-brown (10YR 6/4) from 10-16 ft. Spooned from 10-34 ft.		4/5/6/6	11		
			4/6/5/8	11		
15			5/5/8/8	13		
			3/4/5/5	9		
			3/3/5/6	8		
20						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/08/12	SB-5
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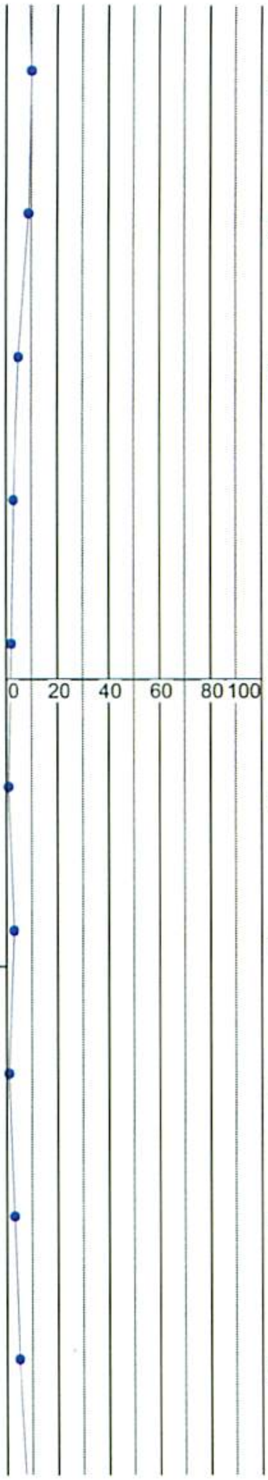

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			3/4/6/6	10		
			3/5/4/4	9		
25			2/3/2/2	5		Casing set to 25 ft. when at 28 ft.
			1/2/1/1	3		
30			1/1/1/2	2		
			1/1/WOH/1	1		FAS/WOH from 31-31.5 ft. Casing set to 30 ft. when at 32 ft.
			1/2/1/1	3		NoEV from 32-34 ft. FAS/WOH from 34.5-35 ft.
35	POORLY GRADED SAND (SP): Very loose to loose Mottled very-pale-brown (10YR 8/2) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 34-42 ft.		1/WOH/1/1	1		NoEV from 36-50 ft.
			1/2/1/3	3		Casing set to 35 ft. when at 38 ft.
40			3/2/3/3	5		

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/08/12	SB-5
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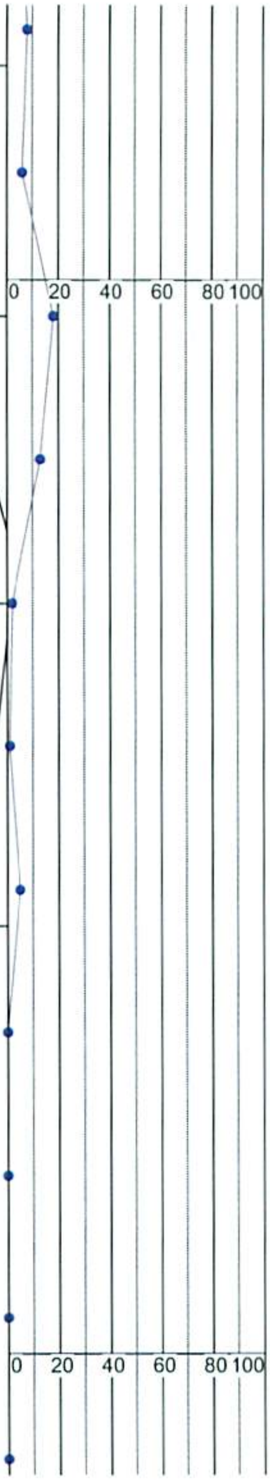


DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			2/3/5/7	8		
	CLAY (CL/CH): Medium stiff to very stiff Mottled light-gray (10YR 7/1) and brownish-yellow (10YR 6/6) clay Spooned from 42-45.5 ft.					Casing set to 40 ft. when at 42 ft.
			3/2/4/4	6		
45						
	POORLY GRADED SAND (SP): Medium dense Light-gray (10YR 7/1) fine to medium quartz sand Spooned from 45.5-48.5 ft.		3/6/12/11	18		
			3/5/8/8	13		
	CLAY (CL/CH): Very soft Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) sandy clay Spooned from 48.5-49.5 ft.					Casing set to 45 ft. when at 48 ft.
	CLAYEY SAND (SC): Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 49.5-50 ft.		8/1/1/3	2		
50						
						FAS/WOH from 51-52 ft.
	CLAY (CL/CH): Very soft to medium stiff Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) sandy clay Spooned from 50-54 ft.		1/1/WOH/WOH	1		Casing set to 50 ft. when at 52 ft.
						NoEV from 52-54 ft.
			2/2/3/3	5		RLOC @ 54 ft.
	CLAY (CL/CH): Very soft Light-gray (10YR 7/1) clay Spooned from 54-62 ft.					
55						DB from 54-58 ft.
			WOR/WOR/WOR/ WOR	WOR		FAS/WOR from 54-56 ft.
						FAS/WOR from 56-58 ft.
			WOR/WOR/WOR/ WOR	WOR		Casing set to 55 ft. when at 58 ft.
						EFR @ 58 ft. @ 12 gpm
			WOR/WOR/WOR/ WOR	WOR		
60						FAS/WOR from 58-60 ft.
						FAS/WOR from 60-62 ft.
			WOR/WOR/WOR/	WOR		

CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	**PROJECT NO:**	8053622	**BORING**
CHECKED BY:	JMW	**BORING DATE:**	11/08/12	**SB-5**
DRAWN BY:	MVK	**PAGE NO:**	3 of 4	

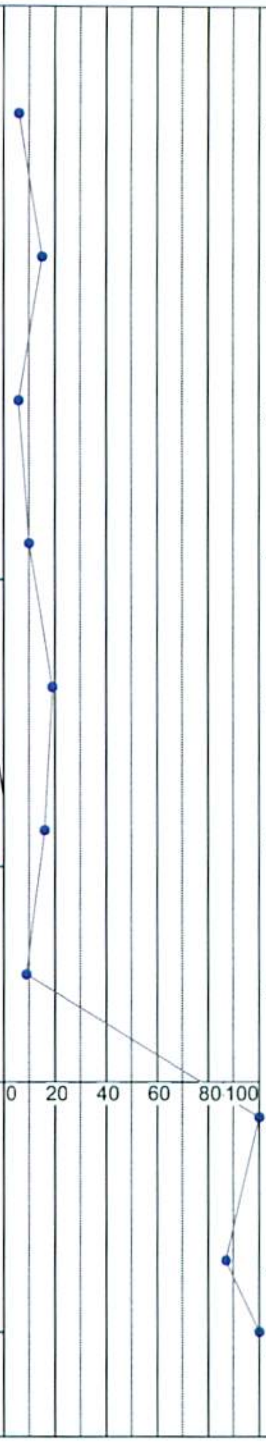
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	CLAY (CL/CH): Very soft Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) sandy clay Spooned from 62-64 ft.		WOR/WOR/WOR/WOR	WOR		Casing set to 60 ft. when at 62 ft. FAS/WOR from 62-64 ft.
65	CLAY (CL/CH): Very soft Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) clay Spooned from 64-66.5 ft.		WOR/WOR/WOR/WOR	WOR		FAS/WOR from 64-66 ft.
	POORLY GRADED SAND (SP): Very loose Light-gray (10YR 7/2) fine to medium quartz sand Spooned from 66.5-67.5 ft.		WOR/WOR/WOR/WOR	WOR		FAS/WOR from 66-68 ft.
	CLAY (CL/CH): Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) clay Spooned from 67.5-68 ft.					RLOC @ 68 ft. DB from 68-78 ft.
70	CLAY (CL/CH): Very soft Light-gray (10YR 7/2) sandy clay Spooned from 68-75 ft.		WOR/WOR/WOR/WOR	WOR		FAS/WOR from 68-70 ft. FAS/WOR from 70-75 ft.
			WOR/WOR/WOR/WOR	WOR		
75	POORLY GRADED SAND (SP): Mottled light-gray (10YR 7/2) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 75-76.2 ft.					FAS/WOR from 75-76 ft.
	LIMESTONE: Moderately strong to strong Light-gray (10YR 7/2) limestone Spooned from 76.2-81 ft.		WOR/WOR/7/6	7		NoEV from 77 ft. to end of boring
			2/3/3/3	6		EFR @ 78 ft. @ 12 gpm
80			4/6/13/10	19		TOB @ 81 ft. bls.
						Grouted borehole

CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/08/12	SB-5
DRAWN BY:	MVK	PAGE NO:	4 of 4	



DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Very-pale-brown (10YR 7/4) fine to medium quartz sand, mottled with grayish-brown (10YR 5/2) from 0-3 ft. Spooned from 0-8 ft.				NoEV throughout boring
		2/2/4/6	6		EFR @ 2 ft. @ 12 gpm
		7/8/7/6	15		
5		3/3/3/4	6		
		4/4/6/8	10		
	POORLY GRADED SAND (SP): Medium dense White (10YR 8/1) fine to medium quartz sand Spooned from 8-11 ft.	7/8/11/16	19		
10	SILTY SAND (SM): Mottled grayish-brown (10YR 5/2), yellow (10YR 7/6) and light-brownish-gray (10YR 6/2) silty fine to medium quartz sand Spooned from 11-12 ft.	8/9/7/9	16		
	CLAY (CL/CH): Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) sandy clay Spooned from 12-15 ft.	3/3/6/7	9		
15	LIMESTONE: Extremely strong Mottled white (10YR 8/1) and light-yellowish-brown (10YR 6/4) limestone Spooned from 15-18.5 ft.	4/17/50+	100+		50 blows for 5 inches of penetration @ 15 ft. Casing set to 15 ft. when at 16 ft.
		41/47/40/50	87		TOB @ 18.5 ft. bls.
		50	100		Grouted borehole
20					

CDM Smith
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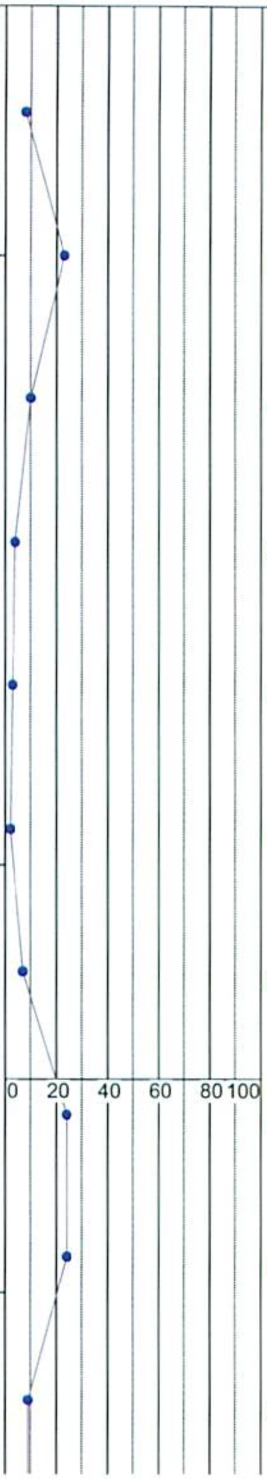
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/09/12	SB-6
DRAWN BY:	MVK	PAGE NO:	1 of 1	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	**POORLY GRADED SAND (SP):** Loose to medium dense Mottled grayish-brown (10YR 5/2) and light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 0-3.5 ft.		1/3/5/7	8		NoEV from 0-42 ft. EFR @ 2 ft. @ 12 gpm
	POORLY GRADED SAND (SP): Very loose to loose Mottled pale-brown (10YR 6/3) and grayish-brown (10YR 5/2) fine to medium quartz sand Spooned from 3.5-12 ft.		4/10/13/13	23		
5			4/5/5/4	10		
			2/2/2/2	4		
10			2/2/1/2	3		
			1/1/1/2	2		
	POORLY GRADED SAND (SP): Loose to medium dense Mottled very-pale-brown (10YR 8/2), very-pale-brown (10YR 7/4), and light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 12-18 ft.		2/2/5/6	7		
15			6/8/16/20	24		
			12/14/10/11	24		
	CLAY (CL/CH): Stiff Mottled light-gray (10YR 7/2) and yellow (10YR 7/6) clay Spooned from 18.5-23.5 ft.		5/4/5/6	9		
20						



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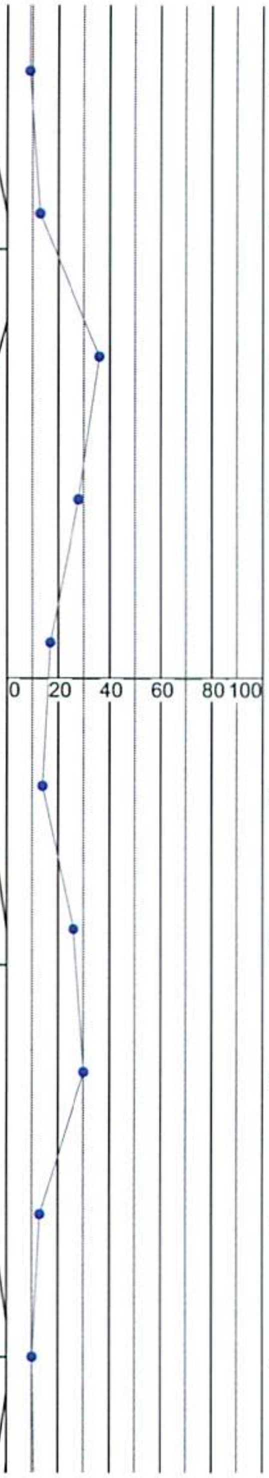
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/09/12	SB-7
DRAWN BY:	MVK	PAGE NO:	1 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			3/5/4/4	9		Casing set to 20 ft. when at 22 ft.
	LIMESTONE: Mottled white (10YR 8/1) and yellow (10YR 7/6) limestone Spooned from 23.5-24 ft.		5/3/10/46	13		
25	CLAY (CL/CH): Mottled light-gray (10YR 7/2) and yellow (10YR 7/6) clay Spooned from 24-25 ft.					
	LIMESTONE: Moderately strong to strong Mottled white (10YR 8/1) and yellow (10YR 7/6) limestone Spooned from 25-33.5 ft.		10/8/28/40	36		
			20/14/14/17	28		
			18/14/3/4	17		
30						SLOC from 30-31 ft.
						EFR @ 31 ft. @ 12 gpm
			5/6/8/10	14		
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 33.5-34 ft.		6/13/13/8	26		
	LIMESTONE: White (10YR 8/1) limestone Spooned from 34-39 ft.					RLOC @ 34 ft.
35						DB from 34 ft. to end of boring
			7/18/12/19	30		
			11/10/3/15	13		
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 39-39.5 ft.					
40	CLAYEY SAND (SC): Light-greenish-gray (5G 7/1) clayey fine to medium quartz sand Spooned from 39.5-40 ft.		11/6/4/8	10		

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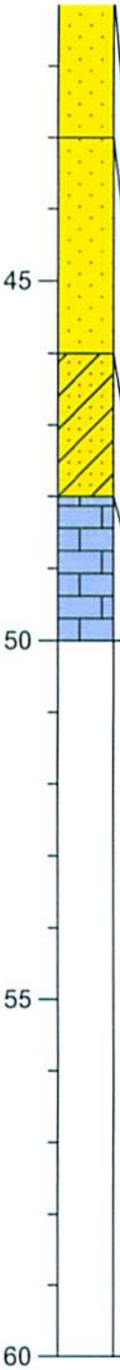
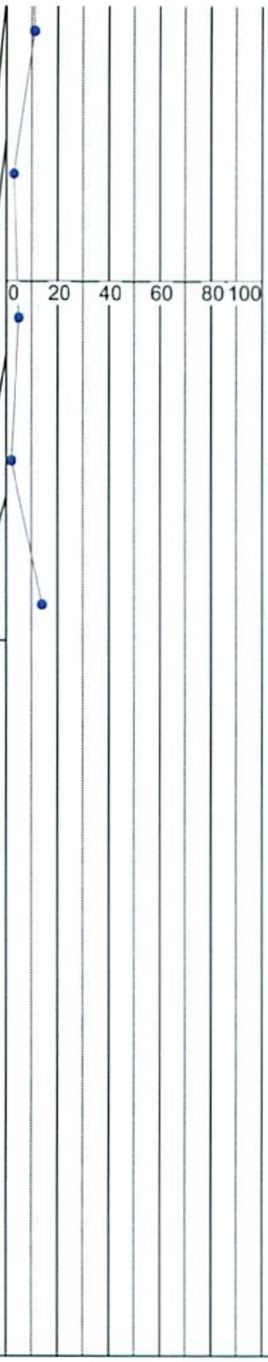
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

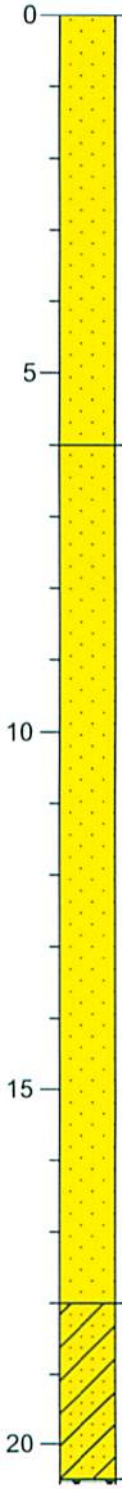
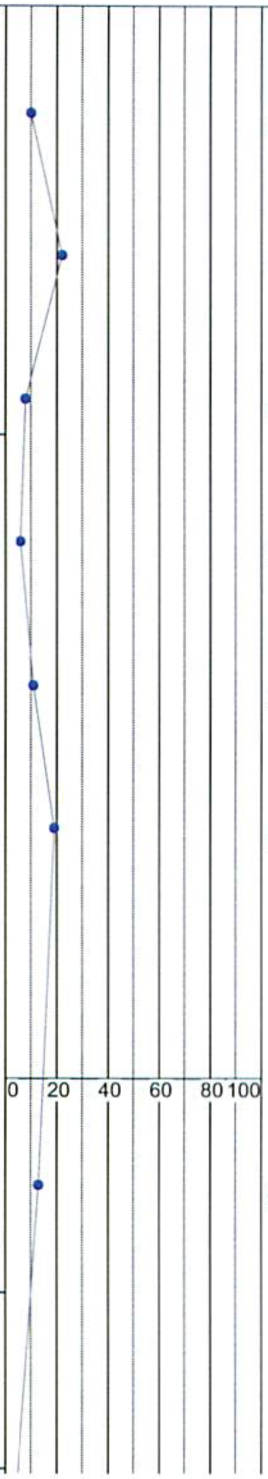
DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/09/12	SB-7
DRAWN BY:	MVK	PAGE NO:	2 of 3	





DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 40-41 ft.	3/5/6/7	11		MOD/WOH from 42.5-43 ft.
POORLY GRADED SAND (SP): Light-gray (10YR 7/2) fine to medium quartz sand Spooned from 41-43 ft.	1/WOH/3/4	3		NoEV from 44-46 ft.
POORLY GRADED SAND (SP): Loose Mottled light-brownish-gray (10YR 6/2), yellow (10YR 7/6) and light-greenish-gray (5G 7/1) fine to medium quartz sand Spooned from 43-46 ft.	2/2/3/5	5		FAS/WOH from 46-46.5 ft.
CLAYEY SAND (SC): Very loose Light-gray (10YR 7/2) clayey fine to medium quartz sand Spooned from 46-48 ft.	WOH/1/1/3	2		NoEV @ 48 ft.
LIMESTONE: Moderately strong White (10YR 8/1) limestone Spooned from 48-50 ft.	4/8/6/6	14		TOB @ 50 ft. bls. Grouted borehole

CDM Smith **Tampa, Florida**	**SPT BORING LOG**	
	SITE NAME: PCRRF - South Stormwater Pond **SITE LOCATION: Spring Hill, Florida**	
	DESIGNED BY: DR CHECKED BY: JMW DRAWN BY: MVK	PROJECT NO: 8053622 BORING DATE: 11/09/12 PAGE NO: 3 of 3
		BORING **SB-7**

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	POORLY GRADED SAND (SP): Loose to medium dense Very-pale-brown (10YR 7/3) fine to medium quartz sand, mottled with dark-brown (10YR 3/3) from 0-2 ft. and light-brownish-gray (10YR 6/2) from 2-6 ft. Spooned from 0-6 ft.		2/3/7/9	10		NoEV throughout boring EFR @ 2 ft. @ 12 gpm
			7/11/11/12	22		
			4/4/4/5	8		
	POORLY GRADED SAND (SP): Loose to medium dense Mottled pale-brown (10YR 6/3) and very-pale-brown (10YR 7/4) fine to medium quartz sand Spooned from 6-12 ft. and 15-17 ft.		3/3/3/4	6		
			3/4/7/10	11		
			5/9/10/13	19		
			5/6/7/7	13		
	CLAYEY SAND (SC): Mottled gray (10YR 6/1) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 20-20.5 ft.					

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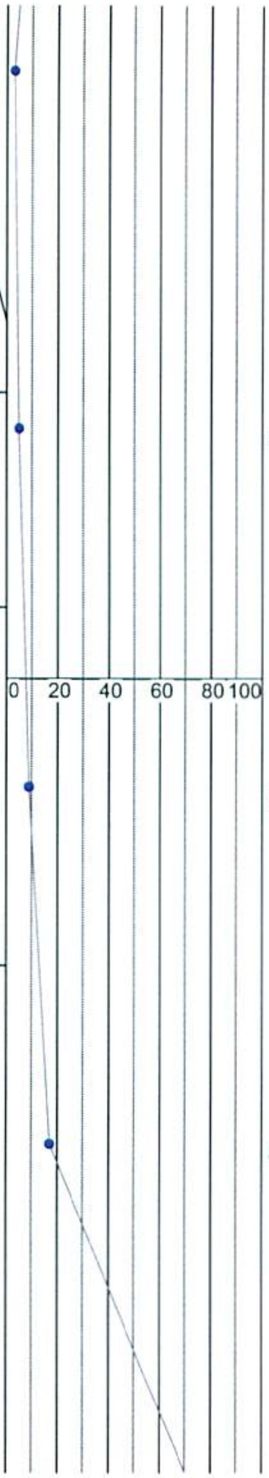
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/09/12	SB-8
DRAWN BY:	MVK	PAGE NO:	1 of 3	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	CLAY (CL/CH): Soft Mottled gray (10YR 6/1) and yellow (10YR 7/6) clay Spooned from 20.5-22 ft.		2/1/2/2	3		Casing set to 20 ft. when at 22 ft.
25	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6) and pale-brown (10YR 6/3) clay Spooned from 25-26 ft.					
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 26-27 ft.		2/3/2/2	5		
30	CLAYEY SAND (SC): Loose Mottled light-gray (10YR 7/2) and light-brownish-gray (10YR 6/2) clayey fine to medium quartz sand Spooned from 30-32 ft.		3/4/5/7	9		
35	LIMESTONE: Strong to extremely strong White (10YR 8/1) limestone Spooned from 35-37 ft. and 40-42 ft.		6/10/7/6	17		Casing set to 35 ft. when at 37 ft. RLOC @ 37 ft. DB from 37 ft. to end of boring
40						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 11/09/12
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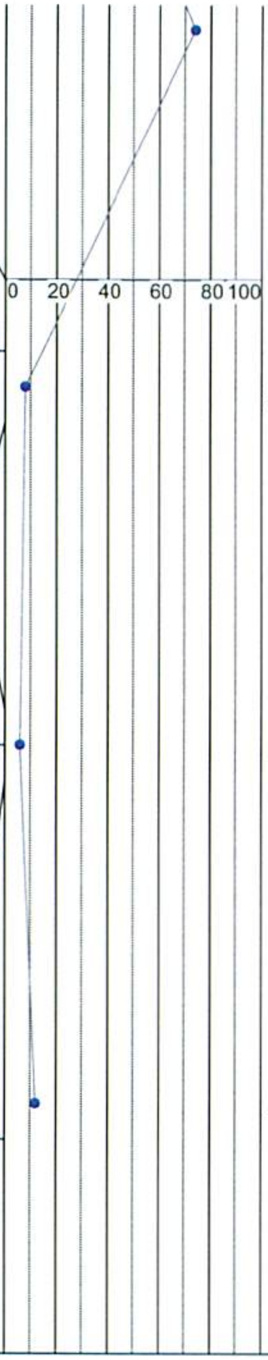
BORING **SB-8**



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			23/35/39/40	74		Casing set to 40 ft. when at 42 ft.
						Drilled hard from 42-45 ft.
45	CLAY (CL/CH): Mottled white (10YR 8/1) and yellow (10YR 7/6) clay Spooned from 45-46 ft.					
	POORLY GRADED SAND (SP): Pale-brown (10YR 6/3) fine to medium quartz sand Spooned from 46-47 ft.		3/6/2/1	8		
	LIMESTONE: White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 50-51 ft. Spooned from 50-51 ft.					
50						
	CLAY (CL/CH): Light-greenish-gray (5G 7/1) clay Spooned from 51-51.5 ft.					
	POORLY GRADED SAND (SP): Light-gray (10YR 7/1) fine to medium quartz sand Spooned from 51.5-52 ft.		12/4/2/1	6		
	LIMESTONE: Moderately strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 55-57 ft. Spooned from 55-57 ft.					Drilled hard from 54 ft. to end of boring
55						
			15/7/5/6	12		TOB @ 57 ft. bls.
						Grouted borehole
60						

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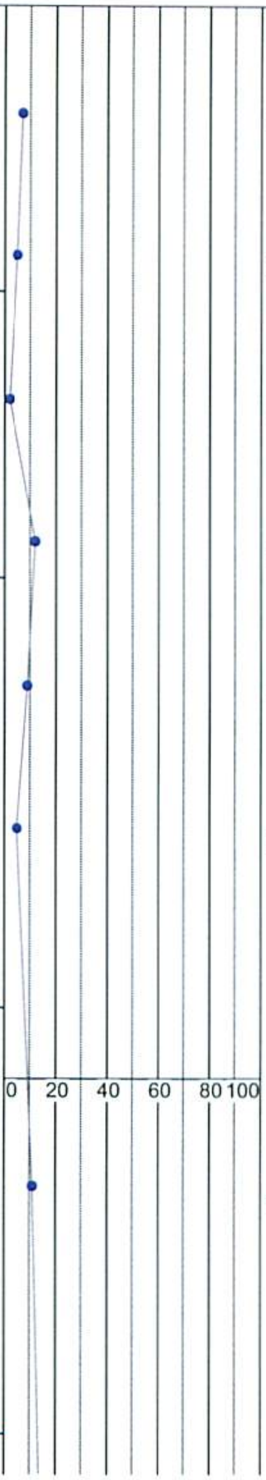
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

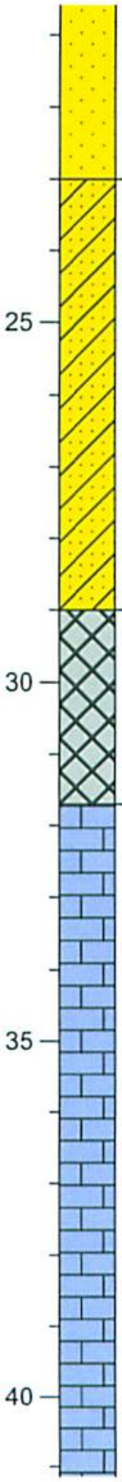
PROJECT NO: 8053622
BORING DATE: 11/09/12
PAGE NO: 3 of 3

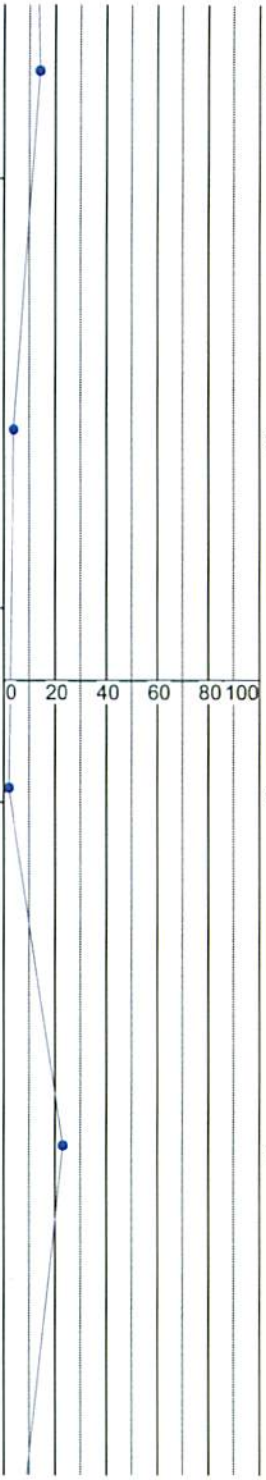
BORING **SB-8**

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Pale-brown (10YR 6/3) fine to medium quartz sand, mottled with brown (10YR 5/3) from 2-4 ft. Spooned from 0-4 ft.		2/2/5/4	7		NoEV from 0-30 ft. EFR @ 2 ft. @ 12 gpm
			2/2/3/3	5		
5	POORLY GRADED SAND (SP): Very loose to medium dense Grayish-brown (10YR 5/2) fine to medium quartz sand Spooned from 4-8 ft.		2/1/1/2	2		
			2/3/9/9	12		
10	POORLY GRADED SAND (SP): Loose Mottled light-brownish-gray (10YR 6/2) and light-gray (10YR 7/2) fine to medium quartz sand Spooned from 8-12 ft.		4/5/4/5	9		
			3/3/2/3	5		
15	SILTY SAND (SM): Medium dense Pale-brown (10YR 6/3) silty fine to medium quartz sand Spooned from 15-17 ft.		4/4/7/8	11		
20	POORLY GRADED SAND (SP):					

CDM Smith **Tampa, Florida**		**SPT BORING LOG** **SITE NAME: PCRRF - South Stormwater Pond** **SITE LOCATION: Spring Hill, Florida**

DESIGNED BY: DR CHECKED BY: JMW DRAWN BY: MVK	PROJECT NO: 8053622 BORING DATE: 11/12/12 PAGE NO: 1 of 3	BORING **SB-9**





DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Medium dense Light-gray (10YR 7/1) fine to medium quartz sand Spooned from 20-22 ft.		7/8/6/6	14		
25	CLAYEY SAND (SC): Very loose Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 25-27 ft.		3/2/2/2	4		Casing set to 25 ft. when at 27 ft.
30	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 30-31.7 ft.		2/1/1/WOH	2		Casing set to 30 ft. when at 30 ft. MOD/WOH from 31.5-32 ft.
35 40	LIMESTONE: Moderately strong to strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 31.7-44 ft., and 50-52 ft. Spooned from 31.7-32 ft., 35-37 ft., 40-42 ft., 45-47 ft., and 50-52 ft.		6/10/13/19	23		SLOC from 32-33 ft. RLOC @ 33 ft. DB from 33 ft. to end of boring NoEV from 35 ft. to end of boring

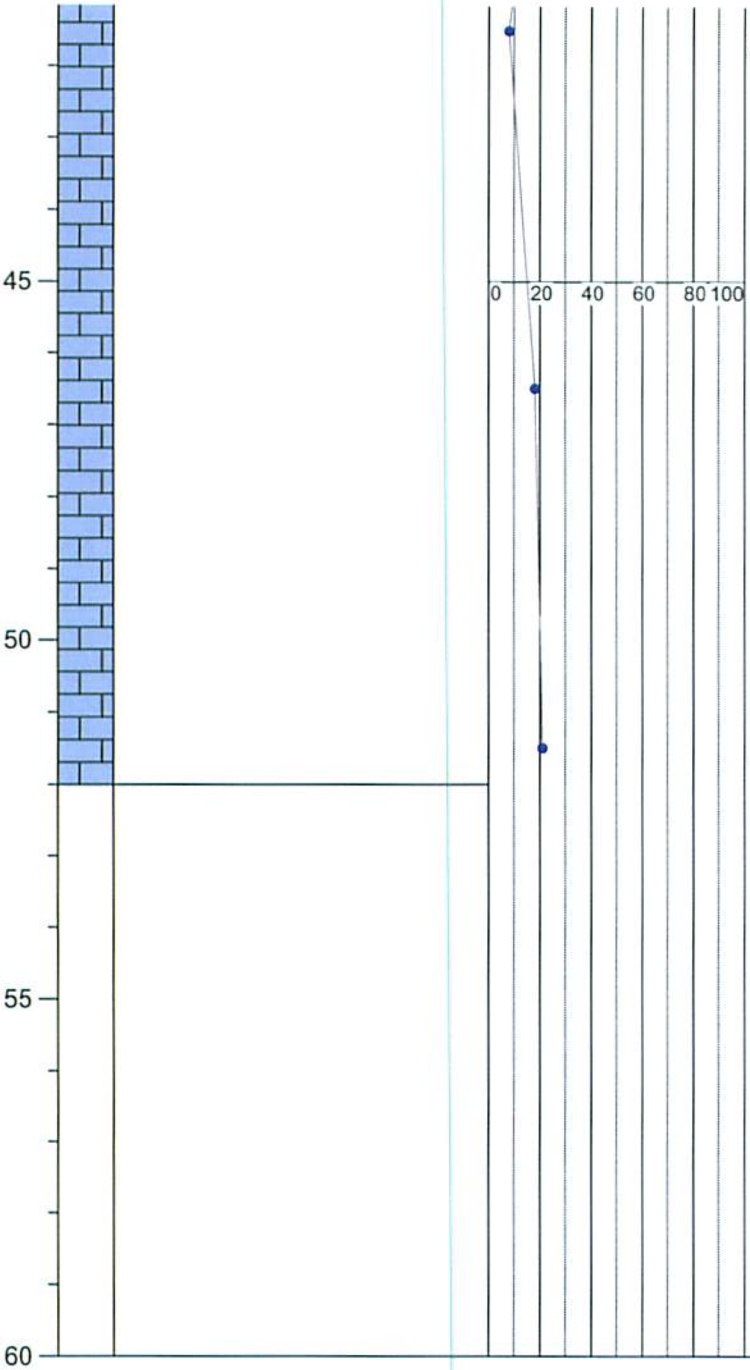
CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/12/12	SB-9
DRAWN BY:	MVK	PAGE NO:	2 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			8/4/4/4	8		
			19/13/5/9	18		
			4/7/14/14	21		TOB @ 52 ft. bls. Grouted borehole



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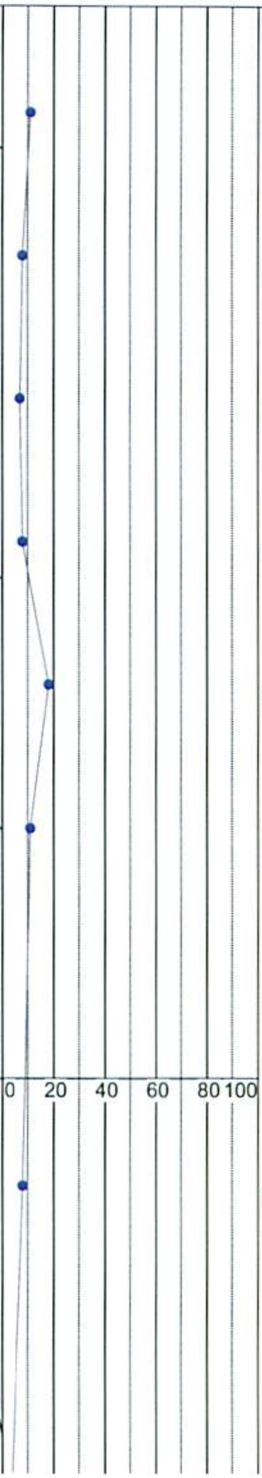
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/12/12	SB-9
DRAWN BY:	MVK	PAGE NO:	3 of 3	



DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Medium dense Very-pale-brown (10YR 7/3) fine to medium quartz sand Spooned from 0-2 ft.	2/5/6/7	11		NoEV from 0-22 ft. EFR @ 0 ft. @ 12 gpm
5	POORLY GRADED SAND (SP): Loose Light-brownish-gray (10YR 6/2) fine to medium quartz sand, mottled with yellow (10YR 7/6) from 2-4 ft. and very-pale-brown (10YR 7/3) from 4-8 ft. Spooned from 2-8 ft.	4/4/4/6 3/3/4/4 3/4/4/6	8 7 8		
10	POORLY GRADED SAND (SP): Medium dense Mottled light-gray (10YR 7/2) and light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 8-11.5 ft.	6/8/10/14	18		
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and light-yellowish-brown (10YR 6/4) clay Spooned from 11.5-12 ft.	7/6/5/7	11		Casing set to 10 ft. when at 12 ft. Drilled hard from 12-22 ft.
15	CLAY (CL/CH): Medium stiff Mottled very-pale-brown (10YR 7/3) and yellow (10YR 7/6) sandy clay Spooned from 15-17 ft.	5/4/4/4	8		Casing set to 15 ft. when at 17 ft.
20	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay				

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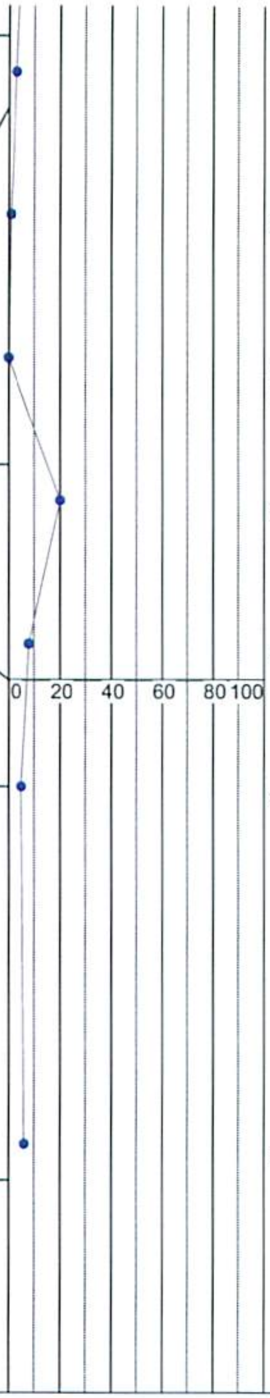
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 12/05/12
PAGE NO: 1 of 2

BORING
SB-10



DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Spooned from 20-21 ft.				
	LIMESTONE: White (10YR 8/1) limestone Spooned from 21-22 ft.	1/1/2/4	3		Casing set to 20 ft. when at 22 ft.
	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 22-27 ft.	2/WOH/1/2	1		Drilled soft from 22-24 ft. SLO/WOH from 22.5-23 ft.
25		WOH/WOH/WOH/ WOH	WOH		SLO/WOH from 24-26 ft. Casing set to 25 ft. when at 26 ft.
	LIMESTONE: Moderately strong White (10YR 8/1) limestone Spooned from 27-30 ft.	6/9/11/7	20		Drilled hard from 26 ft. to end of boring NoEV from 26 ft. to end of boring
		4/4/4/7	8		
30	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 30-31.5 ft.				
	LIMESTONE: Moderately strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 31.5-35 ft. Spooned from 31.5-32 ft. and 35-37 ft.	3/3/2/8	5		RLOC @ 33 ft. DB from 33 ft. to end of boring
35		3/3/3/3	6		TOB @ 37 ft. bls. Grouted borehole
40					

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Tampa, Florida

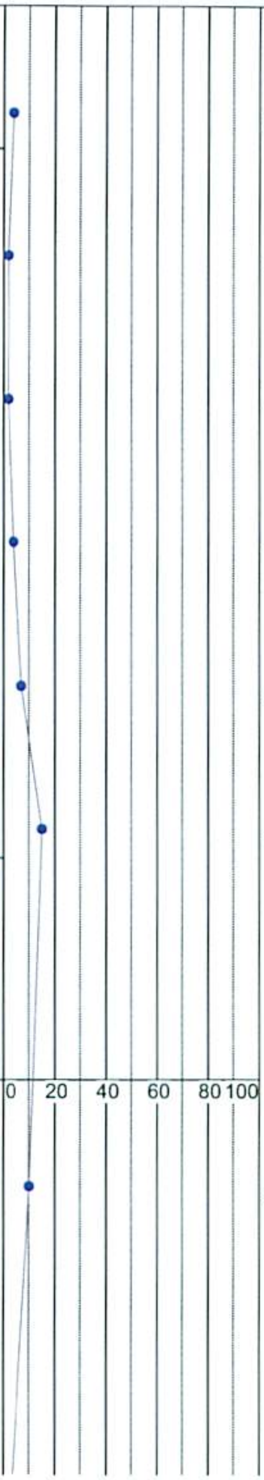
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 12/05/12
PAGE NO: 2 of 2

BORING
SB-10



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Very loose Light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 0-2 ft.		2/2/2/2	4		NoEV from 0-20 ft.
	POORLY GRADED SAND (SP): Very loose to medium dense Mottled very-pale-brown (10YR 7/3) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 2-11.9 ft.		2/1/1/1	2		EFR @ 2 ft. @ 12 gpm
5			1/1/1/WOH	2		
			1/2/2/2	4		
10			2/3/4/7	7		
			7/9/6/6	15		
	CLAY (CL/CH): Light-greenish-gray (5G 7/1) sandy clay Spooned from 11.9-12 ft.					
15	CLAY (CL/CH): Very soft to stiff Mottled ight-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 15-17 ft., and 20-22 ft.		6/5/5/5	10		Casing set to 15 ft. when at 17 ft.
						SLOC from 19-22 ft.
20						MOD/WOH from 20-20.5 ft.

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 11/12/12
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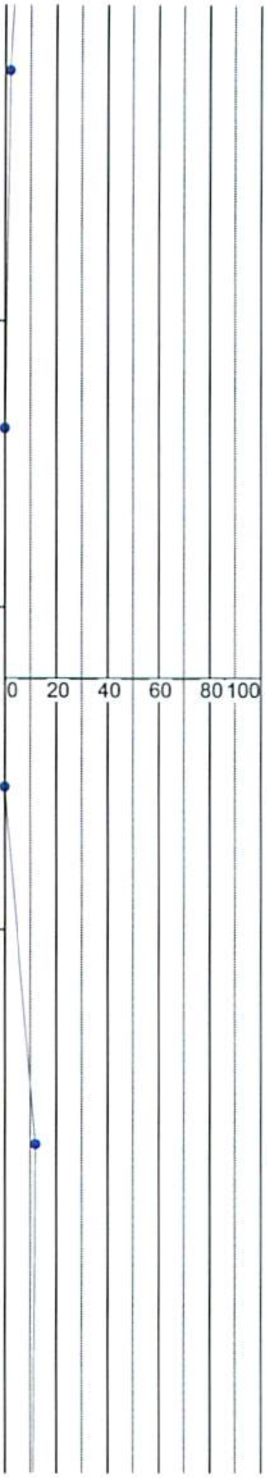
BORING
SB-11



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			WOH/1/1/2	2		Casing set to 20 ft. when at 22 ft. EFR @ 22 ft. @ 12 gpm
25	CLAY (CL/CH): Very soft Mottled very-pale-brown (10YR 7/4) and light-greenish-gray (5G 7/1) clay Spooned from 25-27 ft.		WOH/WOH/WOH/ WOH	WOH		SLO/WOH from 25-27 ft.
30	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 30-32 ft.		WOR/WOR/WOR/1	WOR		RLOC @ 29 ft. DB from 29 ft. to end of boring MOD/WOR from 30-31.5 ft.
35	LIMESTONE: Moderately strong to extremely strong White (10YR 8/1) limestone Spooned from 35-37 ft., 40-42 ft., 45-47 ft., and 50-52 ft.		3/6/6/5	12		NoEV from 35 ft. to end of boring Casing set to 35 ft. when at 37 ft.
40						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING	
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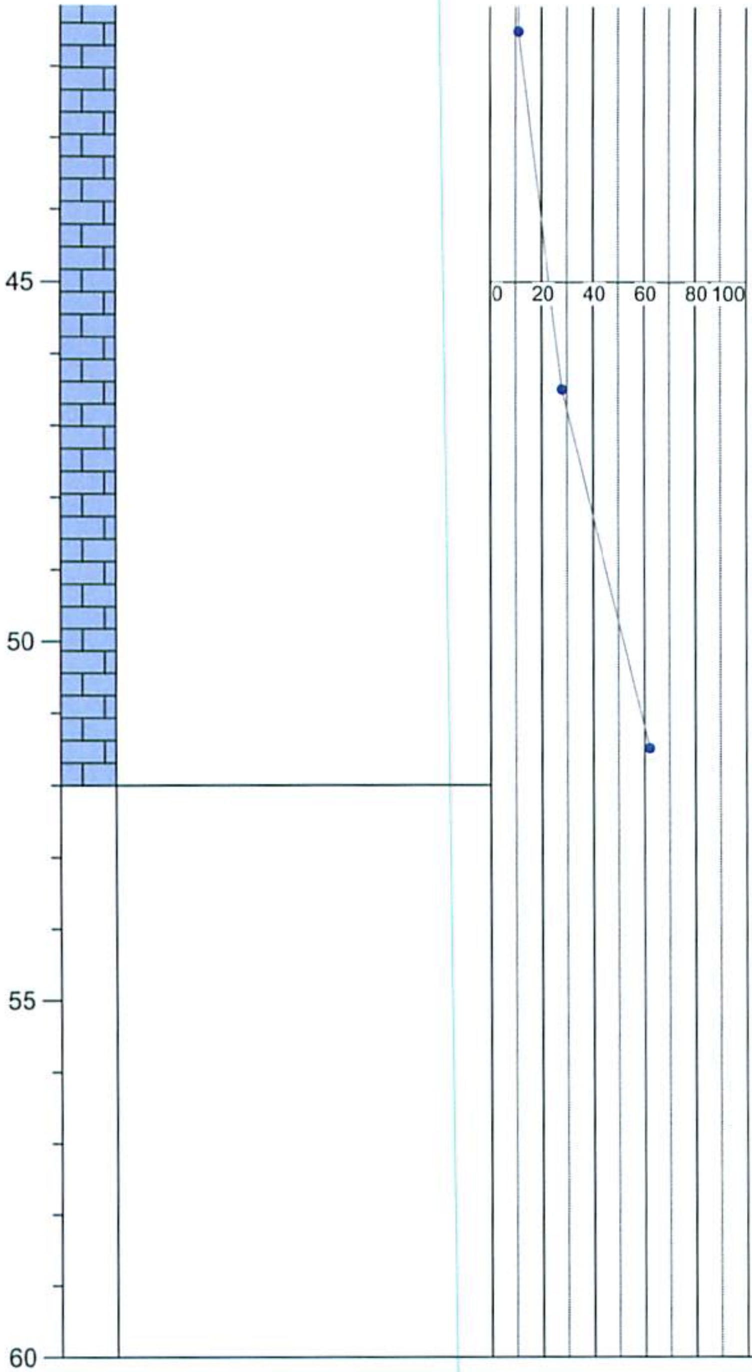

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			5/3/8/3	11		
			21/12/16/12	28		
			28/30/32/30	62		TOB @ 52 ft. bls.
						Grouted borehole

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
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DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	SILTY SAND (SM): Loose Mottled light-brownish-gray (10YR 6/2), brown (10YR 5/3), brown (10YR 4/3) and yellow (10YR 7/6) silty fine to medium quartz sand Spooned from 0-2 ft.		3/5/4/5	9		NoEV from 0-20 ft.
	CLAYEY SAND (SC): Medium dense Mottled light-brownish-gray (10YR 6/2) and light-gray (10YR 7/1) clayey fine to medium quartz sand Spooned from 2-4 ft.		4/7/11/9	18		EFR @ 2 ft. @ 12 gpm
5	POORLY GRADED SAND (SP): Medium dense Mottled very-pale-brown (10YR 7/3) and light-gray (10YR 7/1) fine to medium quartz sand Spooned from 4-6 ft.		4/6/7/7	13		
	CLAY (CL/CH): Stiff Mottled very-pale-brown (10YR 7/3) and yellow (10YR 7/6) sandy clay Spooned from 6-7.5 ft.		4/6/6/8	12		
10	POORLY GRADED SAND (SP): Mottled very-pale-brown (10YR 7/3), light-gray (10YR 7/1) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 7.5-8 ft.		3/4/4/4	8		
	SILTY SAND (SM): Loose Mottled light-gray (10YR 7/2), brown (10YR 5/3) and dark-grayish-brown (10YR 4/2) silty fine to medium quartz sand Spooned from 8-10 ft.		3/3/3/4	6		
	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6) and dark-brown (10YR 3/3) clay Spooned from 10-12 ft.					RLOC @ 14 ft.
15	CLAY (CL/CH): Soft Light-gray (10YR 7/2) clay with limestone gravel Spooned from 15-17 ft.		3/1/2/2	3		DB from 14-15 ft. EFR @ 15 ft. @ 12 gpm RLOC @ 16 ft. DB from 16-20 ft.
20	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel					Casing set to 15 ft. when at 17 ft. Casing set to 20 ft. when at 20 ft.

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
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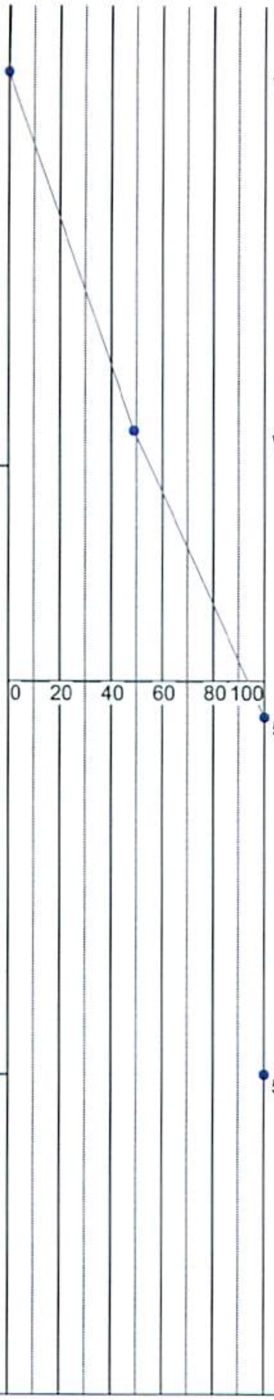

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Spooned from 20-22 ft. and 25-27 ft.					EFR @ 20 ft. @ 12 gpm
			WOH/WOH/WOH/2	WOH		FAS/WOH from 20-21.5 ft.
25						MOD/WOH from 25-25.5 ft.
			WOH/7/42/35	49		
	LIMESTONE: Extremely strong Mottled white (10YR 8/1) and yellow (10YR 7/6) limestone Spooned from 30-30.5 ft. and 35-35.5 ft.					Drilled hard from 27 ft. to end of boring
30			50	100		NoEV from 30 ft. to end of boring
35			50	100		TOB @ 35.5 ft. bls. Grouted borehole
40						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
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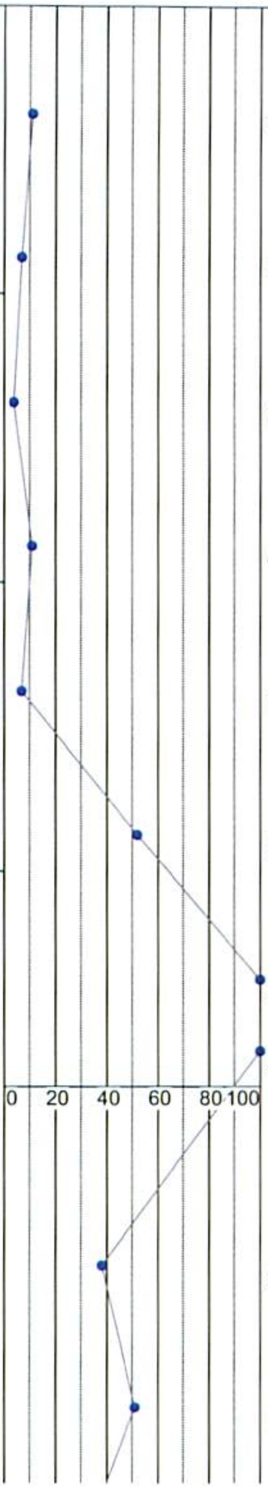
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Light-yellowish-brown (10YR 6/4) fine to medium quartz sand, mottled with yellow (10YR 7/6) and gray (10YR 5/1) from 0-2 ft., and with brown (10YR 5/3) from 2-4 ft. Spooned from 0-4 ft.		3/6/5/6	11		NoEV throughout boring EFR @ 2 ft. @ 12 gpm
			3/4/3/3	7		
5	POORLY GRADED SAND (SP): Very loose to medium dense White (10YR 8/1) fine to medium quartz sand, mottled with light-gray (10YR 7/1) from 6-8 ft. Spooned from 4-8 ft.		2/2/2/3	4		
			4/5/6/7	11		
10	CLAY (CL/CH): Medium stiff to hard Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6) and reddish-brown (5YR 5/3) clay with limestone gravel from 11-12 ft. Spooned from 8-12 ft.		3/3/4/6	7		
			5/11/41/50+	52		50 blows for 4 inches of penetration @ 11.5 ft.
	LIMESTONE: Strong to extremely strong Very-pale-brown (10YR 8/2) limestone, mottled with Very-pale-brown (10YR 7/3) from 12-26 ft. Spooned from 12-13.5 ft., 14-14.5 ft., 16-23.5 ft., 24-25 ft. and 26-26.5 ft.					Casing set to 10 ft. when at 12 ft.
			21/32/50+	100+		Drilled hard from 12-16 ft.
15			50+	100+		50 blows for 5 inches of penetration @ 13 ft. 50 blows for 5 inches of penetration @ 14 ft.
			9/20/18/11	38		
20			10/23/28/50	51		



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR	PROJECT NO: 8053622	BORING
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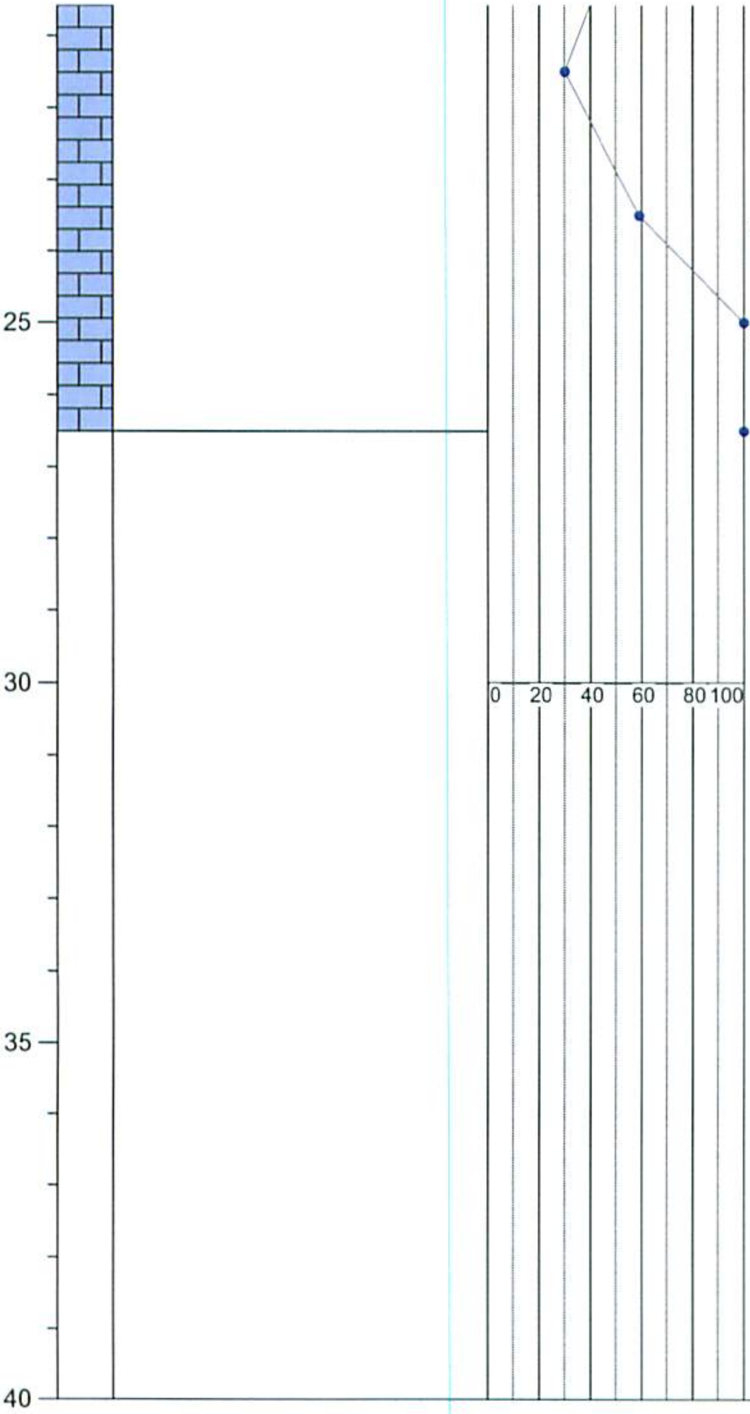

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			15/7/23/50+	30		RLOC @ 21 ft. DB from 21 ft. to end of boring
			27/9/50	59		50 blows for 5 inches of penetration @ 21.5 ft. Drilled hard from 23-24 ft.
			23/50+	100+		50 blows for 5 inches of penetration @ 24.5 ft. Drilled hard from 25-26 ft.
			16/50+	100+		50 blows for 1 inch of penetration @ 26.5 ft. TOB @ 26.5 ft. bls. Grouted borehole

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/13/12	SB-13
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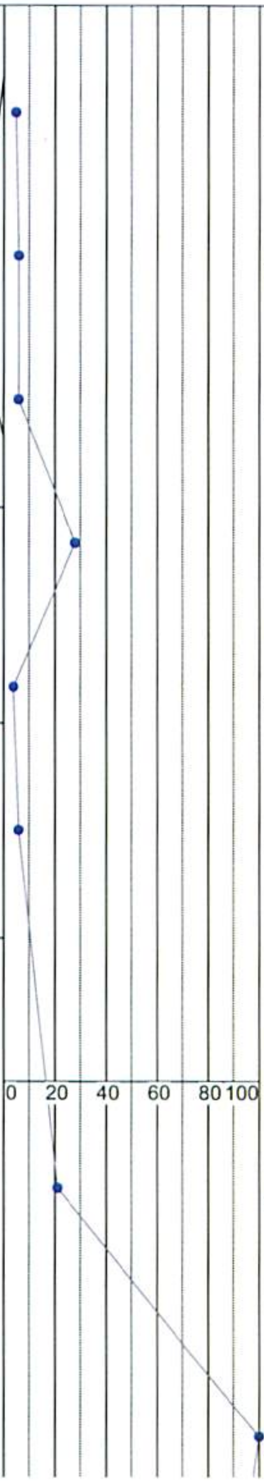

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Mottled brownish-yellow (10YR 6/6), yellow (10YR 7/6) and grayish-brown (10YR 5/2) fine to medium quartz sand Spooned from 0-1 ft.				NoEV throughout boring
		2/2/3/4	5		
					EFR @ 2 ft. @ 12 gpm
	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 1-6 ft.	3/3/3/6	6		
5					
	CLAY (CL/CH): Mottled light-gray (10YR 7/2), yellow (10YR 7/6) and light-greenish-gray (5G 7/1) clay Spooned from 6-7 ft.	2/2/4/7	6		
					RLOC @ 6 ft.
					DB from 6-12 ft.
	LIMESTONE: Weak Very-pale-brown (10YR 8/2) limestone Spooned from 7-10 ft.	1/4/24/7	28		
		3/3/1/1	4		
10	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 10-12 ft.				
		2/3/3/4	6		
					Casing set to 10 ft. when at 12 ft.
	LIMESTONE: Very strong to extremely strong Mottled very-pale-brown (10YR 8/2) and yellow (10YR 7/6) limestone Spooned from 15-17 ft., @ 20 ft. and from 25-27 ft.				EFR @ 12 ft. @ 12 gpm
					Drilled hard from 13-15 ft.
15					SLOC from 14.5-17 ft.
					50 blows for 5 inches of penetration @ 16.5 ft.
		9/5/16/50+	21		
					Casing set to to 15 ft. when at 17 ft.
					EFR @ 17 ft. @ 12 gpm
					Drilled hard from 17-19.5 ft.
20		50+	100+		RLOC @ 17.5 ft.

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
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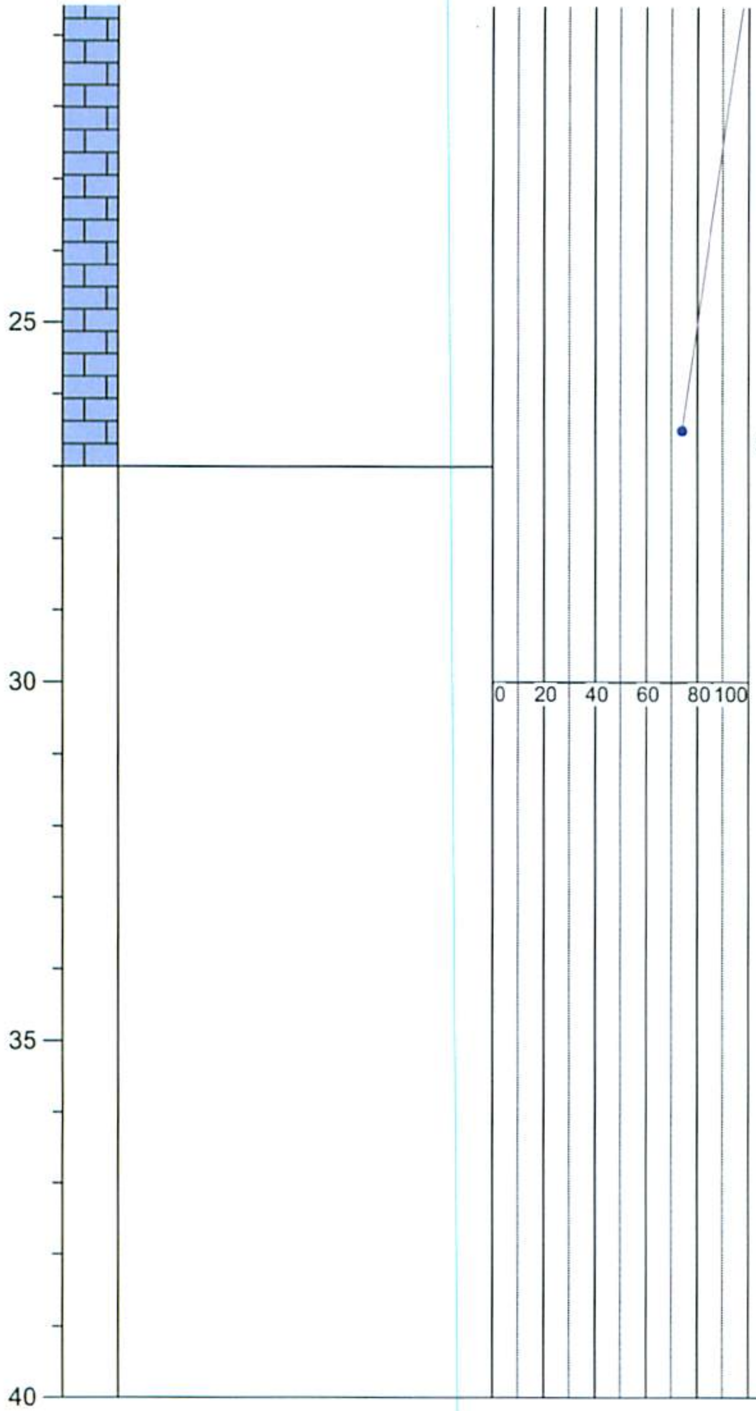

DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
				DB from 17.5 ft. to end of boring
				50 blows for 2 inches of penetration @ 20 ft.
	21/28/46/50	74		
				TOB @ 27 ft. bls.
				Grouted borehole

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
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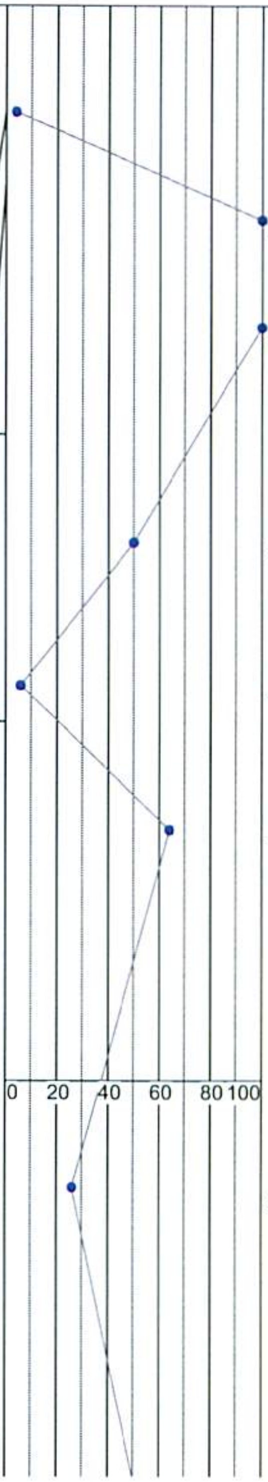

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Very loose Mottled light-yellowish-brown (10YR 6/4), light-gray (10YR 7/1) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 0-1.5 ft.					NoEV throughout boring
			1/2/2/2	4		
						EFR @ 2 ft. @ 12 gpm
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and brownish-yellow (10YR 6/6) clay with phosphorite Spooned from 1.5-2.5 ft.		4/50+	100+		50 blows for 5 inches of penetration @ 2.5 ft.
						Drilled hard from 2.5-6 ft.
5	LIMESTONE: Extremely strong White (10YR 8/1) limestone Spooned from 2.5-3 ft. and 4-4.5 ft.		50+	100+		50 blows for 5 inches of penetration @ 4 ft.
	CLAY (CL/CH): Medium stiff to hard Mottled light-gray (10YR 7/1), light-greenish-gray (5G 7/1) and yellow (10YR 7/6) calcareous clay Spooned from 6-10 ft.		25/25/25/16	50		
			4/3/3/5	6		
10	LIMESTONE: Strong to extremely strong Mottled very-pale-brown (10YR 8/2) and pale-brown (10YR 6/3) limestone Spooned from 10-12 ft., 15-17 ft., 20-22 ft., and 25-26.5 ft.		15/42/22/27	64		
						Drilled hard from 13-13.5 ft.
						SLOC from 14-19 ft.
15						Casing set to 15 ft. when at 15 ft.
			5/11/15/6	26		
						RLOC @ 19 ft.
20						DB from 19-22 ft.

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SPT BORING LOG

SITE NAME: **PCRRF - South Stormwater Pond**
SITE LOCATION: **Spring Hill, Florida**

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-15
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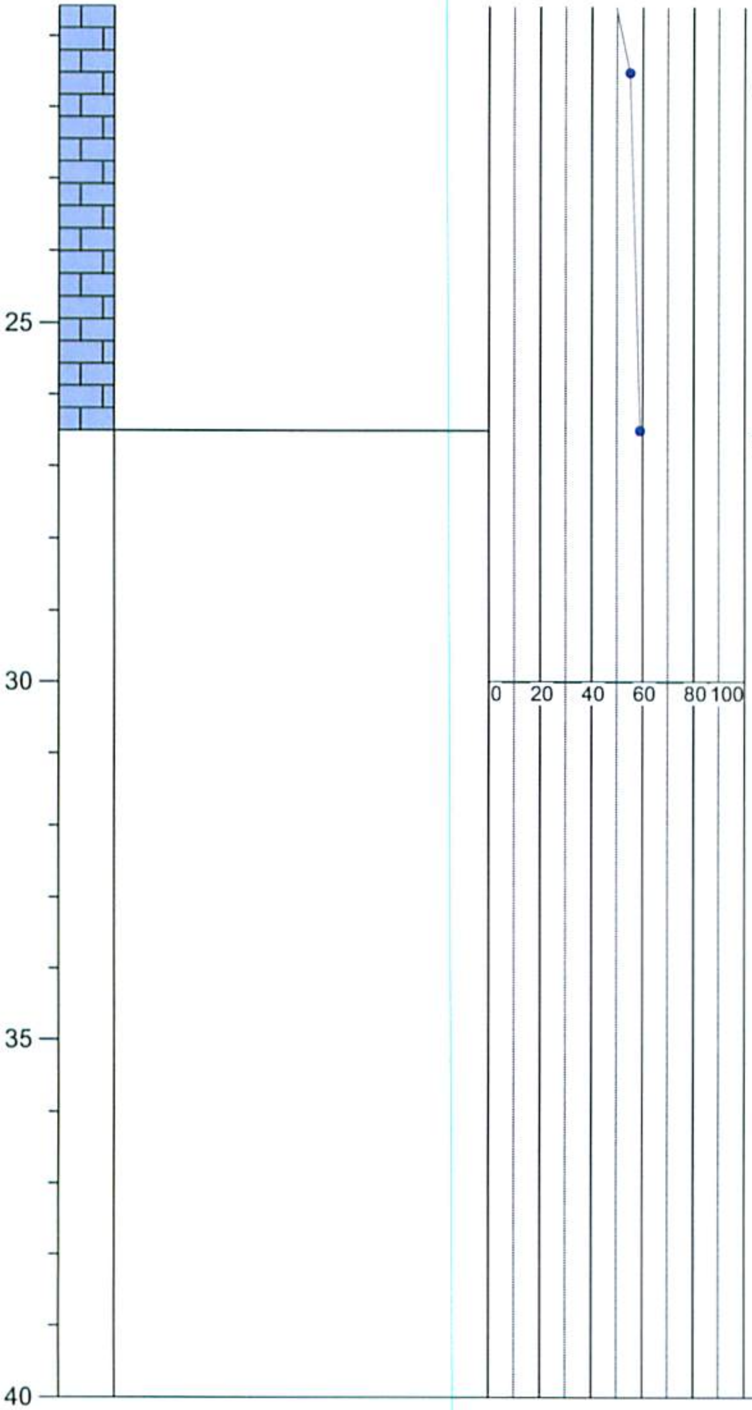

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			7/7/48/44	55		Drilled hard from 20 ft. to end of boring
						Casing set to 20 ft. when at 22 ft.
						EFR @ 22 ft. @ 12 gpm
25						Casing set to 25 ft. when at 25 ft.
			7/9/50	59		TOB @ 26.5 ft. bls.
						Grouted borehole
30						
35						
40						

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SDII GLOBAL

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
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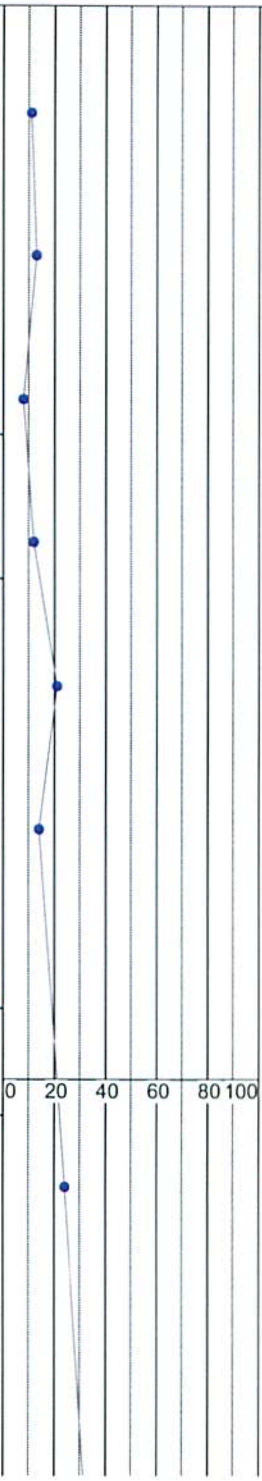

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Mottled very-pale-brown (10YR 7/4) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 0-6 ft.				NoEV from 0-30 ft.
		2/4/7/7	11		EFR @ 2 ft. @ 12gpm
		6/6/7/7	13		
5		3/4/4/6	8		
	SILTY SAND (SM): Medium dense Mottled yellowish-brown (10YR 5/4) and dark-brown (10YR 3/3)) silty fine to medium quartz sand Spooned from 6-8 ft.	5/5/7/10	12		
	POORLY GRADED SAND (SP): Medium dense Mottled very-pale-brown (10YR 7/4) and grayish-brown (10YR 5/2) fine to medium quartz sand Spooned from 8-12 ft.	6/10/11/14	21		
10		6/6/8/10	14		
15	CLAY (CL/CH): Light-gray (10YR 7/2) sandy clay Spooned from 15-15.5 ft.				
	POORLY GRADED SAND (SP): Medium dense White (10YR 8/1) fine to medium quartz sand Spooned from 15.5-17 and 20-22 ft.	7/9/15/18	24		
20					

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

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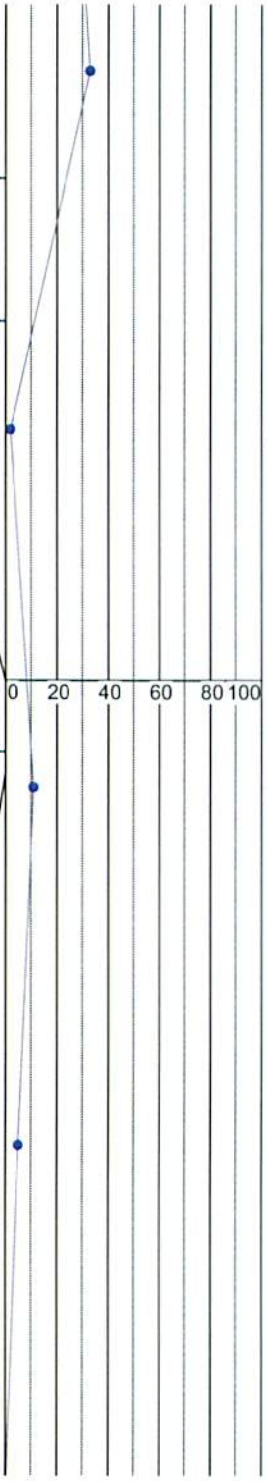

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			12/16/17/17	33		
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and light-gray (10YR 7/2) sandy clay Interval not spooned; litholgy based on drilling returns					
25	CLAYEY SAND (SC): Very loose Light-gray (10YR 7/2) clayey fine to medium quartz sand Spooned from 25-27 ft.					SLOC from 25-27 ft.
			2/1/1/1	2		RLOC @ 27 ft. DB from 27-32 ft.
30	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 30-31 ft.					SLO/WOH from 30-30.5 ft.
	LIMESTONE: Very-pale-brown (10YR 7/3) limestone Spooned from 31-31.3 ft.		WOH/3/8/4	11		Casing set to 30 ft. when at 32 ft.
	CLAY (CL/CH): Very soft to very stiff Very-pale-brown (10YR 7/3) clay with limestone gravel, mottled with yellow (10YR 7/6) from 31.3-40 ft. Spooned from 31.3-32 ft., 35-37 ft. and 40-42 ft.					SLOC from 30-35 ft.
35						RLOC @ 35 ft. DB from 35-37 ft.
			1/2/3/13	5		NoEV @ 35 ft. Casing set to 35 ft. when at 37 ft. EFR @ 37 ft. @ 12 gpm
40						Drilled soft from 40-69 ft.

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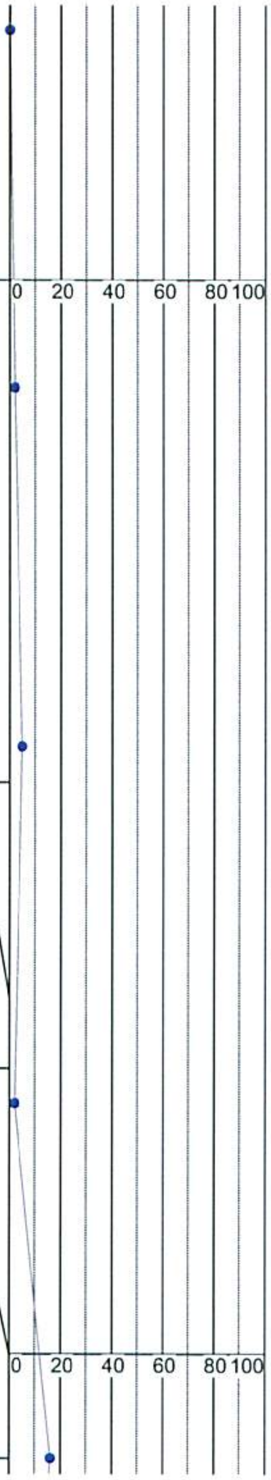
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-16
DRAWN BY:	MVK	PAGE NO:	2 of 5	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			WOH/WOH/WOH/9	WOH		FAS/WOH from 40-41.5 ft. RLOC @ 42.5 ft. DB from 42.5 ft. to end of boring
45	NO RECOVERY: Spooned from 45-47 ft. and 50-52 ft. without recovery		3/2/WOH/2	2		SLO/WOH from 46-46.5 ft.
50			WOR/3/2/2	5		FAS/WOR from 50-50.5 ft. Casing set to 50 ft. when at 52 ft.
	CLAY (CL/CH): Very-pale-brown (10YR 7/3) clay with limestone gravel Interval not spooned; litholgy based on drilling returns					
55	CLAYEY SAND (SC): Mottled light-gray (10YR 7/2) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 55-56 ft.					
	POORLY GRADED SAND (SP): Light-gray (10YR 7/2) fine to medium quartz sand Spooned from 56-57 ft.		1/2/WOH/WOH	2		FAS/WOH from 56-57 ft. Casing set to 55 ft. when at 57 ft.
60	POORLY GRADED SAND (SP): Medium dense Mottled very-pale-brown (10YR 7/3) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 60-61.5 ft.		10/15/1/2	16		Casing set to 60 ft. when at 60 ft. NoEV from 60-75 ft.



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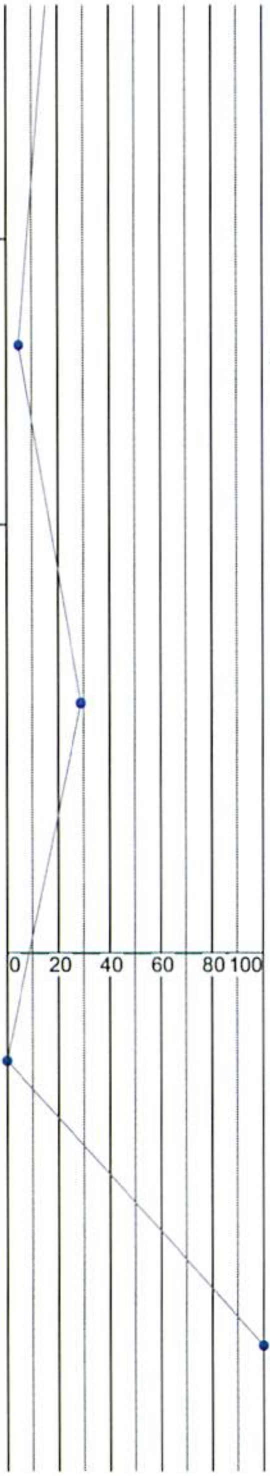
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-16
DRAWN BY:	MVK	PAGE NO:	3 of 5	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	LIMESTONE: Mottled white (10YR 8/1) and yellow (10YR 7/6) limestone Spooned from 61.5-62 ft.					
65	POORLY GRADED SAND (SP): Loose Fine to medium quartz sand with limestone gravel and clay Spooned from 65-67 ft.		2/2/3/4	5		Casing set to 65 ft. when at 67 ft.
70	LIMESTONE: Weak to extremely strong Very-pale-brown (10YR 8/2) limestone, mottled with yellow (10YR 7/6) from 75-77 and 78-80 ft. Spooned from 70-72 ft., 75-77 ft., 80-80.5 ft., 85-85.5 ft. and 90-91 ft.		20/15/14/18	29		Casing set to 70 ft. when at 72 ft. Drilled hard from 72-74 ft.
75			1/WOH/WOH/WOH	WOH		FAS/WOH from 75.5-77 ft. Casing set to 75 ft. when at 77 ft. EFR @ 77 ft. @ 12 gpm Drilled hard from 79-82 ft.
80			50+	100+		NoEV from 80 ft. to end of boring 50 blows for 4 inches of penetration @ 80 ft.

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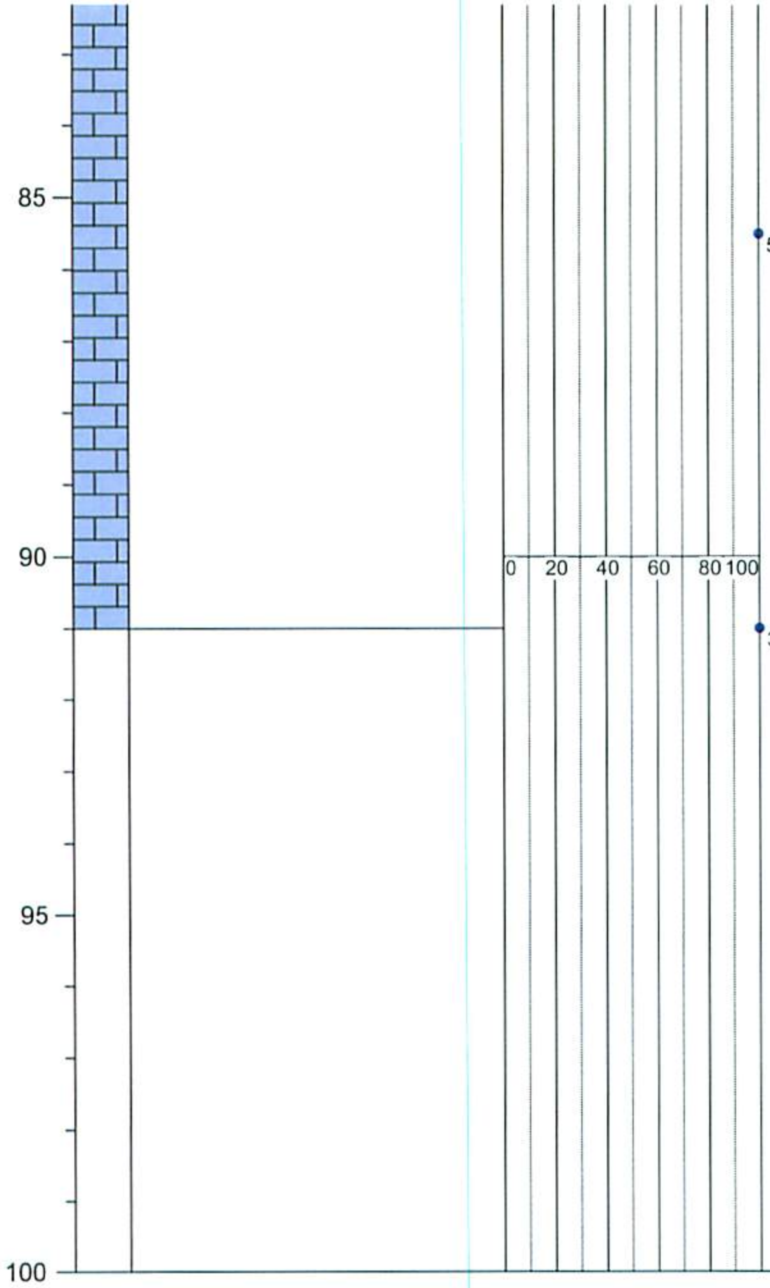
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-16
DRAWN BY:	MVK	PAGE NO:	4 of 5	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
						Drilled hard from 85-86 ft.
			50+	100+		50 blows for 3 inches of penetration @ 85 ft. Drilled hard from 87-88 ft.
			37/50	100		TOB @ 91 ft. bls. Grouted borehole



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SPT BORING LOG

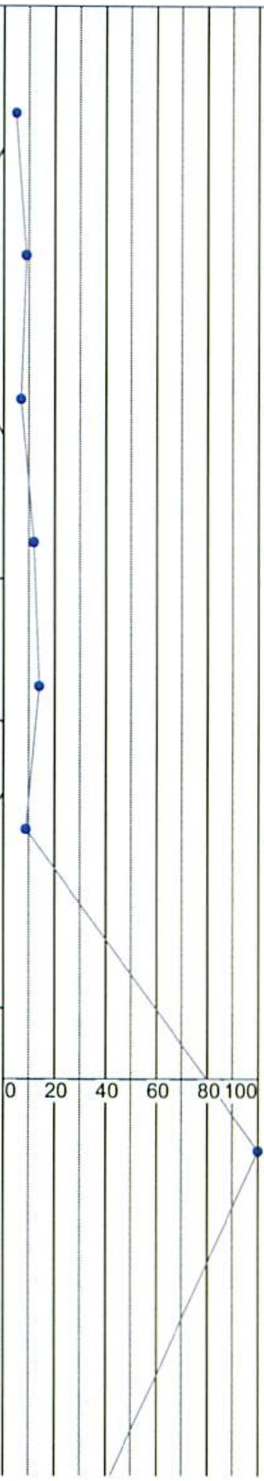
SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-16
DRAWN BY:	MVK	PAGE NO:	5 of 5	

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Mottled light-brownish-gray (10YR 6/2) and brown (10YR 5/3) fine to medium quartz sand Spooned from 0-2 ft.	2/2/3/5	5		NoEV throughout boring
	SILTY SAND (SM): Loose Dark-grayish-brown (10YR 4/2) silty fine to medium quartz sand Spooned from 2-6 ft.	4/4/5/5	9		EFR @ 2 ft. @ 12 gpm
5		3/3/4/5	7		
	POORLY GRADED SAND (SP): Medium dense Mottled grayish-brown (10YR 5/2) and very-pale-brown (10YR 7/4) fine to medium quartz sand Spooned from 6-8 ft.	4/4/8/10	12		
	CLAY (CL/CH): Stiff Mottled light-greenish-gray (5G 7/1) and light-gray (10YR 7/1) clay with sand Spooned from 8-10 ft.	4/7/7/8	14		
10	CLAY (CL/CH): Light-gray (10YR 7/1) sand clay Spooned from 10-11 ft.				
	CLAY (CL/CH): Mottled yellow (10YR 7/6) and greenish-gray (5G 5/1) clay Spooned from 11-12 ft.	6/4/5/11	9		Casing set to 10 ft. when at 12 ft.
15	LIMESTONE: Strong to extremely strong Very-pale-brown (10YR 8/2) limestone, mottled with light-brownish-gray (10YR 6/2) from 15-15.9 ft. Spooned from 15-16 ft., 20-22 ft. and 25-27 ft.	27/50+	100+		Drilled hard from 14 ft. to end of boring 50 blows for 5 inches of penetration @ 15.5 ft. Casing set to 15 ft. when at 16 ft.
20					SLOC from 20-24 ft.

PENETRATION

blows per foot



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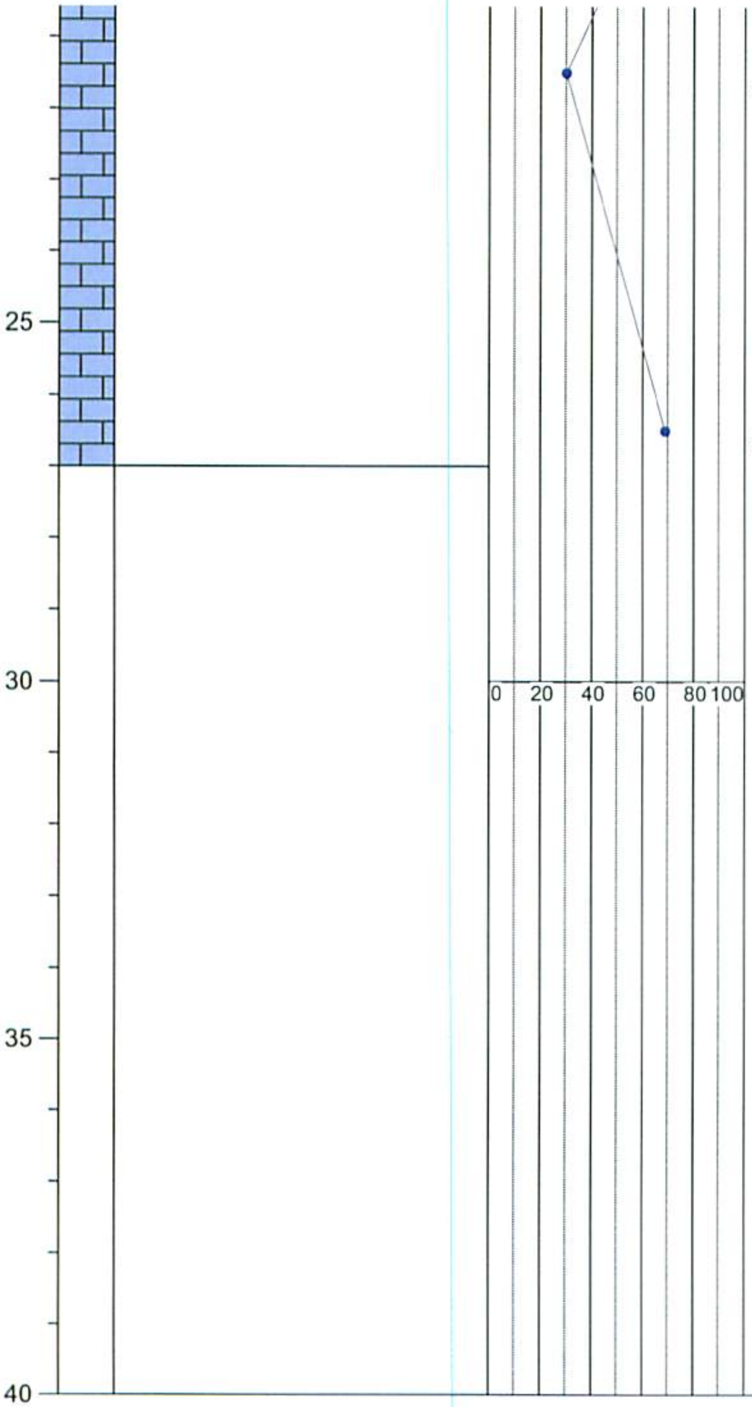
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/30/12	SB-17
DRAWN BY:	MVK	PAGE NO:	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			8/13/17/26	30		
						RLOC @ 24 ft.
25						DB from 24 ft. to end of boring
			6/28/41/18	69		
						TOB @ 27 ft. bls.
						Grouted borehole
30						
35						
40						

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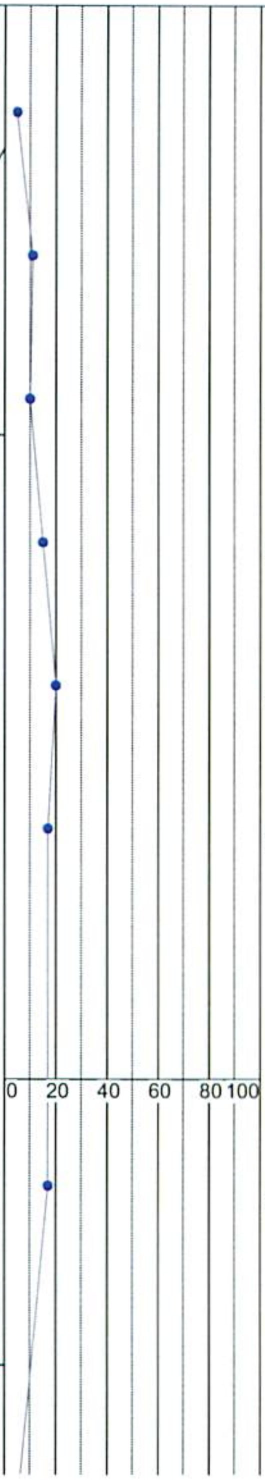
SDII GLOBAL

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/30/12	SB-17
DRAWN BY:	MVK	PAGE NO:	2 of 2	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Mottled very-pale-brown (10YR 7/4) and brown (10YR 5/3) fine to medium quartz sand Spooned from 0-2 ft.		1/2/3/5	5		NoEV throughout boring EFR @ 2 ft. @ 12 gpm
5	SILTY SAND (SM): Loose to medium dense Yellowish-brown (10YR 5/4) silty fine to medium quartz sand Spooned from 2-6 ft.		4/5/6/6 3/4/6/6	11 10		
10 15	POORLY GRADED SAND (SP): Medium dense Pale-brown (10YR 6/3) fine to medium quartz sand Spooned from 6-12 ft. and 15-17 ft.		6/6/9/12 4/9/11/11 6/9/8/11 6/9/8/11	15 20 17 17		
20	CLAY (CL/CH): Soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 20-22 ft.					



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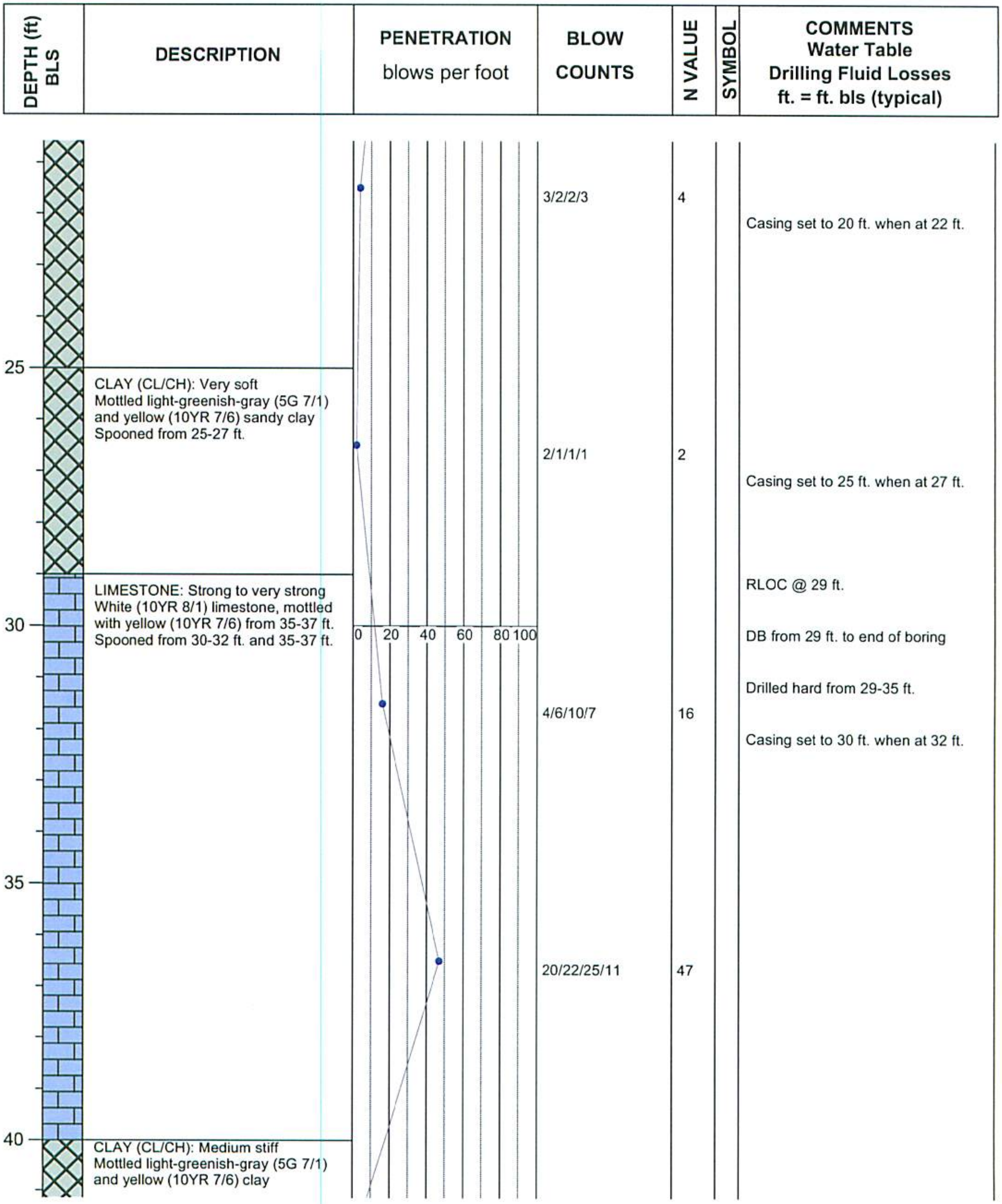
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/26/12	SB-18
DRAWN BY:	MVK	PAGE NO:	1 of 3	



DESCRIPTION	BLOW COUNTS	N VALUE	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	3/2/2/3	4	Casing set to 20 ft. when at 22 ft.
CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 25-27 ft.	2/1/1/1	2	Casing set to 25 ft. when at 27 ft.
LIMESTONE: Strong to very strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 35-37 ft. Spooned from 30-32 ft. and 35-37 ft.			RLOC @ 29 ft. DB from 29 ft. to end of boring Drilled hard from 29-35 ft.
	4/6/10/7	16	Casing set to 30 ft. when at 32 ft.
	20/22/25/11	47	
CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay			

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
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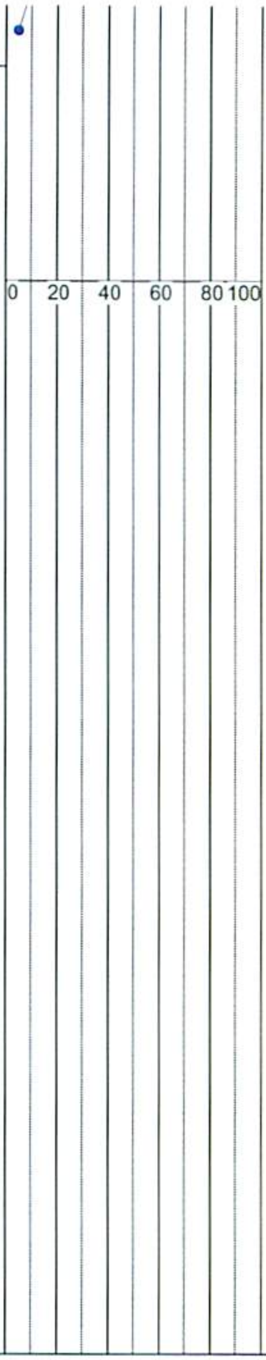
PROJECT NO: 8053622
BORING DATE: 11/26/12
PAGE NO: 2 of 3

BORING **SB-18**

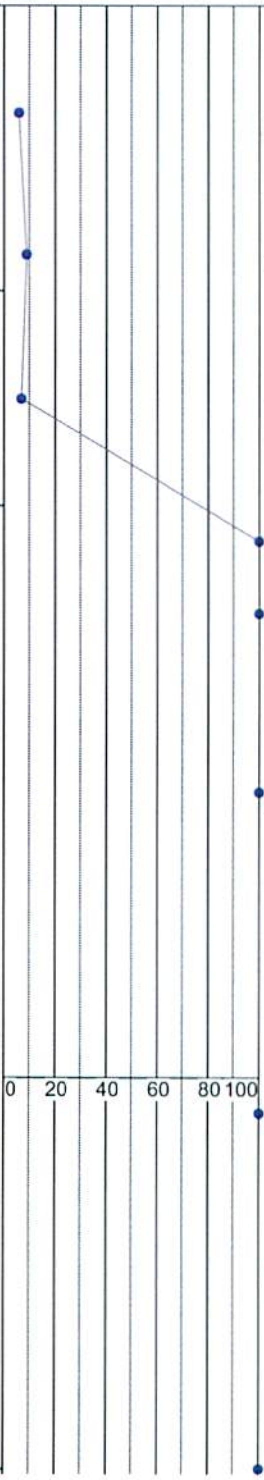
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
▨	Spooned from 40-42 ft.		3/2/3/4	5		TOB @ 42 ft. bls. Grouted borehole
45						
50						
55						
60						

CDM Smith **Tampa, Florida**	SDII GLOBAL	**SPT BORING LOG** **SITE NAME: PCRRF - South Stormwater Pond** **SITE LOCATION: Spring Hill, Florida**

DESIGNED BY:	**DR**	**PROJECT NO:**	**8053622**	**BORING**
CHECKED BY:	**JMW**	**BORING DATE:**	**11/26/12**	**SB-18**
DRAWN BY:	**MVK**	**PAGE NO:**	**3 of 3**	

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 0-4 ft.				NoEV throughout boring
		1/3/3/4	6		
					EFR @ 2 ft. @ 12 gpm
		4/4/5/7	9		
5	CLAY (CL/CH): Medium stiff Mottled Very-pale-brown (10YR 7/3) and yellow (10YR 7/6) sandy clay Spooned from 4-7 ft.				
		3/3/4/4	7		
	LIMESTONE: Extremely strong Mottled very-pale-brown (10YR 8/2) and yellow (10YR 7/6) limestone Spooned from 7-7.5 ft., 8-8.5 ft., 10-11 ft., 15-15.5 ft. and 20-20.5 ft.	3/12/50+	100+		50 blows for 5 inches of penetration @ 7 ft.
					Drilled hard from 8-10 ft.
		50+	100+		
					50 blows for 5 inches of penetration @ 8 ft.
10					50 blows for 4 inches of penetration @ 10.5 ft.
		41/50+	100+		Casing set to 10 ft. when at 11 ft.
					Drilled hard from 13 ft. to end of boring
15		50+	100+		50 blows for 4 inches of penetration @ 15 ft.
20					

PENETRATION
blows per foot



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 11/29/12
PAGE NO: 1 of 2

BORING
SB-19

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
						TOB @ 20.5 ft. bls. Grouted borehole
25						
30		0 20 40 60 80 100				
35						
40						

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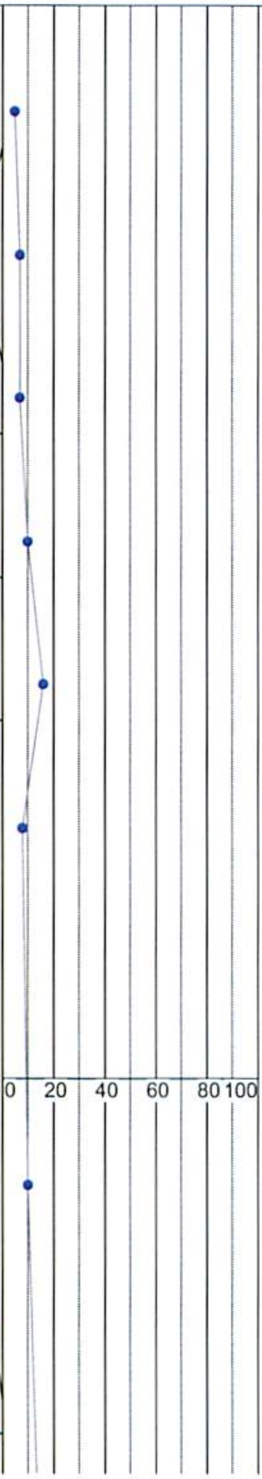
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/29/12	SB-19
DRAWN BY:	MVK	PAGE NO:	2 of 2	

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Light-yellowish-brown (10YR 6/4) fine to medium quartz sand, mottled with light-brownish-gray (10YR 6/2) from 0-1 ft. Spooned from 0-2 ft.	1/2/3/5	5		NoEV from 0-35 ft. EFR @ 2 ft. @ 12 gpm
	SILTY SAND (SM): Loose Yellowish-brown (10YR 5/4) silty fine to medium quartz sand Spooned from 2-5 ft.	4/4/3/4	7		
5	SILTY SAND (SM): Reddish-brown (5YR 5/3) silty fine to medium quartz sand Spooned from 5-6 ft.	2/3/4/4	7		
	POORLY GRADED SAND (SP): Loose Yellowish-brown (10YR 5/4) fine to medium quartz sand Spooned from 6-8 ft.	3/4/6/8	10		
	CLAYEY SAND (SC): Medium dense Mottled very-pale-brown (10YR 7/3) and light-brownish-gray (10YR 6/2) clayey fine to medium quartz sand Spooned from 8-10 ft.	4/10/6/9	16		
10	CLAY (CL/CH): Medium stiff to stiff Light-greenish-gray (5G 7/1) sandy clay, mottled with yellow (10YR 7/6) from 15-19.5 ft. Spooned from 10-12 ft. and 15-17 ft.	2/3/5/7	8		
15		3/5/5/6	10		Casing set to 15 ft. when at 17 ft.
	LIMESTONE: White (10YR 8/1) limestone Interval not spooned; lithology based on drilling returns				Drilled hard from 19.5-20 ft.
20	CLAY (CL/CH): Stiff				

PENETRATION
blows per foot



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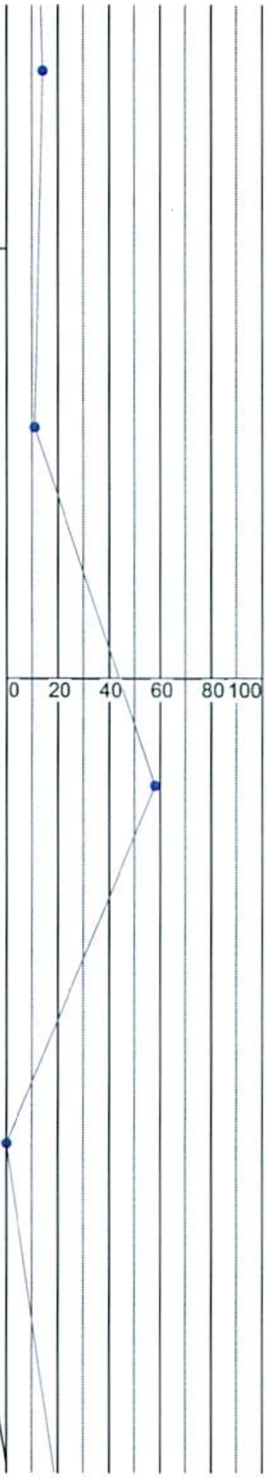
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/20/12	SB-20
DRAWN BY:	MVK	PAGE NO:	1 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 20-22 ft.		6/10/4/6	14		Drilled soft from 20-24 ft.
	LIMESTONE: Weak to extremely strong White (10YR 8/1) limestone Spooned from 25-27 ft., 30-32 ft., 35-37 ft. and 40-41 ft.					Drilled hard from 24-28 ft.
25						
			4/4/7/15	11		
						RLOC @ 27.5 ft.
						DB from 27.5 ft. to end of boring
30						
			24/28/30/22	58		
35						SLO/WOH from 35-37 ft.
			WOH/WOH/WOH/ WOH	WOH		Casing set to 35 ft. when at 37 ft.
40	CLAYEY SAND (SC): Mottled light-gray (10YR 7/2) and light-greenish-gray (5G 7/1) clayey fine to medium					NoEV from 40 ft. to end of boring



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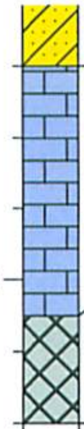
GLOBAL

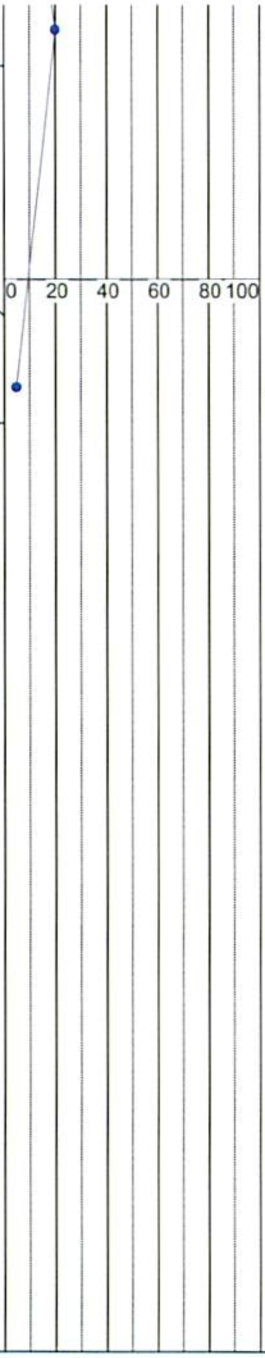
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/20/12	SB-20
DRAWN BY:	MVK	PAGE NO:	2 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	quartz sand Spooned from 41-42 ft.		14/14/6/8	20		
	LIMESTONE: White (10YR 8/1) limestone Spooned from 45-45.5 ft.					
45						
	CLAY (CL/CH): Medium stiff Mottled light-gray (10YR 7/2) and light-greenish-gray (5G 7/1) clay Spooned from 45.5-47 ft.		12/2/3/3	5		Casing set to 45 ft. when at 47 ft. TOB @ 47 ft. bls. Grouted borehole
50						
55						
60						





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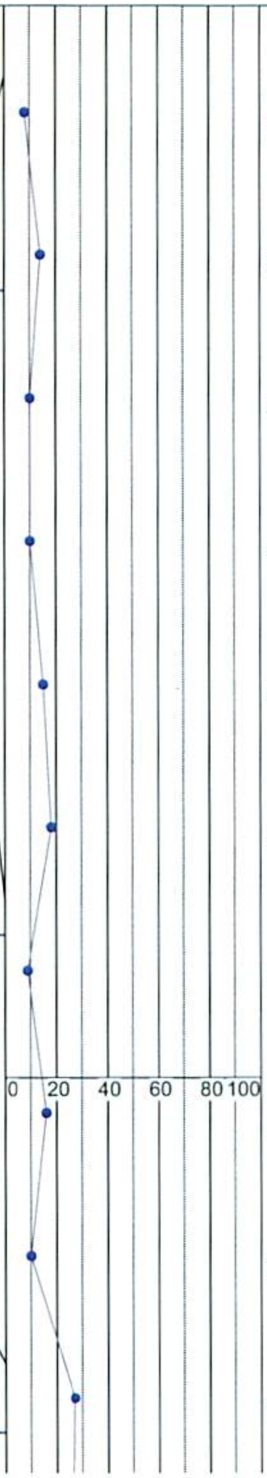
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/20/12	SB-20
DRAWN BY:	MVK	PAGE NO:	3 of 3	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Pale-brown (10YR 6/3) fine to medium quartz sand Spooned from 0-1 ft.					NoEV throughout boring
	SILTY SAND (SM): Medium dense Light-brownish-gray (10YR 6/2) silty fine to medium quartz sand, mottled with yellow (10YR 7/6) from 2-4 ft. Spooned from 1-4 ft.		1/3/5/8 5/7/7/10	8 14		EFR @ 2 ft. @ 12 gpm
5 10	POORLY GRADED SAND (SP): Loose to medium dense Mottled white (10YR 8/1) and light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 4-12.5 ft.		4/4/6/6 4/5/5/7 4/7/8/8	10 10 15		
	CLAYEY SAND (SC): Mottled light-brownish-gray (10YR 6/2) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 12.5-13 ft.		5/8/10/12	18		
15	CLAY (CL/CH): Stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 13-19 ft.		4/5/4/6 7/10/6/8 3/4/6/5	9 16 10		Casing set to 15 ft. when at 18 ft.
	LIMESTONE: White (10YR 8/1) limestone Spooned from 19-20 ft.		4/14/13/8	27		
20	POORLY GRADED SAND (SP):					

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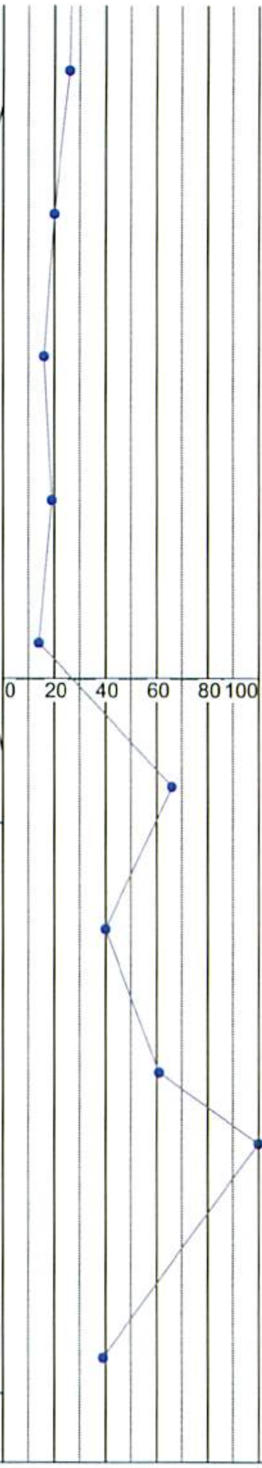
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING	
CHECKED BY:	JMW	BORING DATE:	11/28/12	SB-21	
DRAWN BY:	MVK	PAGE NO:	1 of 2		

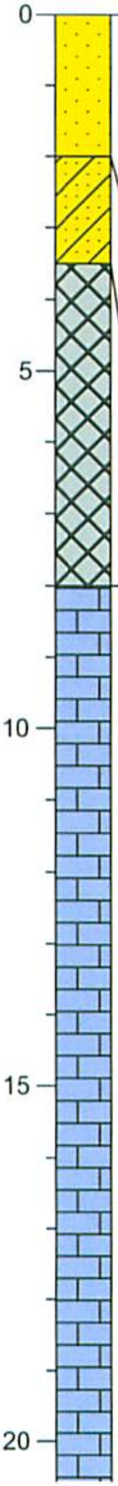
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Medium dense Mottled light-brownish-gray (10YR 6/2), yellow (10YR 7/6) and light-gray (10YR 7/1) fine to medium quartz sand Spooned from 20-22 ft.		5/13/13/17	26		Casing set to 20 ft. when at 22 ft.
	POORLY GRADED SAND (SP): Medium dense Light-gray (10YR 7/1) fine to medium quartz sand Spooned from 22-31 ft.		5/8/12/12	20		
25			4/6/10/13	16		
			6/8/11/12	19		Casing set to 25 ft. when at 28 ft.
30			3/5/9/13	14		
	LIMESTONE: Extremely strong Mottled white (10YR 8/1) and yellow (10YR 7/6) limestone Spooned from 31-31.5 ft.		6/16/50	66		Casing set to 30 ft. when at 31.5 ft.
	CLAY (CL/CH): Hard Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel Spooned from 32-36.5 ft. and 38-40 ft.		32/25/15/12	40		Drilled hard from 34 ft. to end of boring
35			13/19/42/50+	61		
			50+	100+		
						TOB @ 40 ft. bls.
40			26/19/20/20	39		Grouted borehole

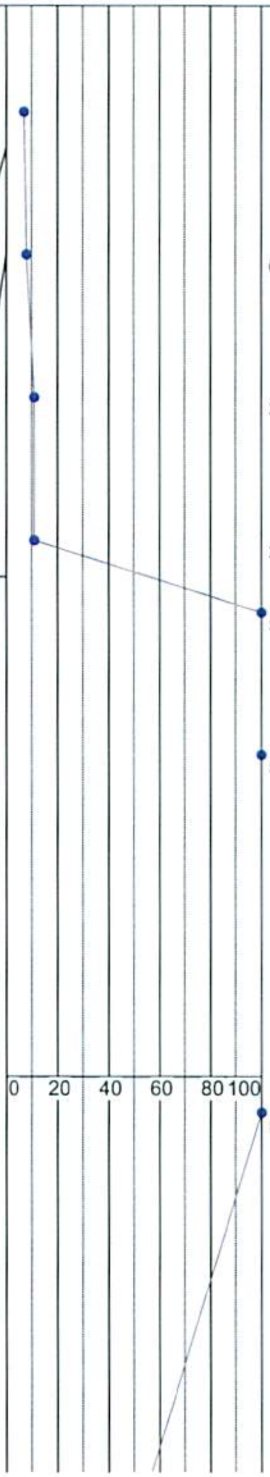
CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/28/12	SB-21
DRAWN BY:	MVK	PAGE NO:	2 of 2	





DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	POORLY GRADED SAND (SP): Loose Mottled light-yellowish-brown (10YR 6/4), grayish-brown (10YR 5/2) and brown (10YR 5/3) fine to medium quartz sand Spooned from 0-2 ft.		1/2/5/6	7		NoEV throughout boring EFR @ 2 ft. @ 12 gpm
	CLAYEY SAND (SC): Loose Mottled brown (10YR 5/3), yellow (10YR 7/6) and light-gray (10YR 7/1) clayey fine to medium quartz sand Spooned from 2-3.5 ft.		6/4/4/4	8		
	CLAY (CL/CH): Medium dense Mottled light-gray (10YR 7/1), light-yellowish-brown (10YR 6/4) and dark-brown (10YR 3/3) sandy clay Spooned from 3.5-8 ft.		3/5/6/6 3/4/7/9	11 11		
	LIMESTONE: Extremely strong Very-pale-brown (10YR 8/2) limestone, mottled with light-greenish-gray (5G 7/1) from 12-14 ft., yellow (10YR 7/6) from 14-15.3 ft. and light-brownish-gray (10YR 6/2) from 20-22 ft. Spooned from 8-8.5 ft., 10-10.5 ft., 15-15.5 ft., 20-22 ft. and 25-25.5 ft.		50+ 50+ 50+	100+ 100+ 100+		Drilled hard from 8-13 ft. 50 blows for 4 inches of penetration @ 8 ft. 50 blows for 3 inches of penetration @ 10.5 ft. Casing set to 10 ft. when at 10.5 ft. Drilled hard from 13-15 ft. 50 blows for 3 inches of penetration @ 15 ft. RLOC @ 19 ft. DB from 19 ft. to end of boring

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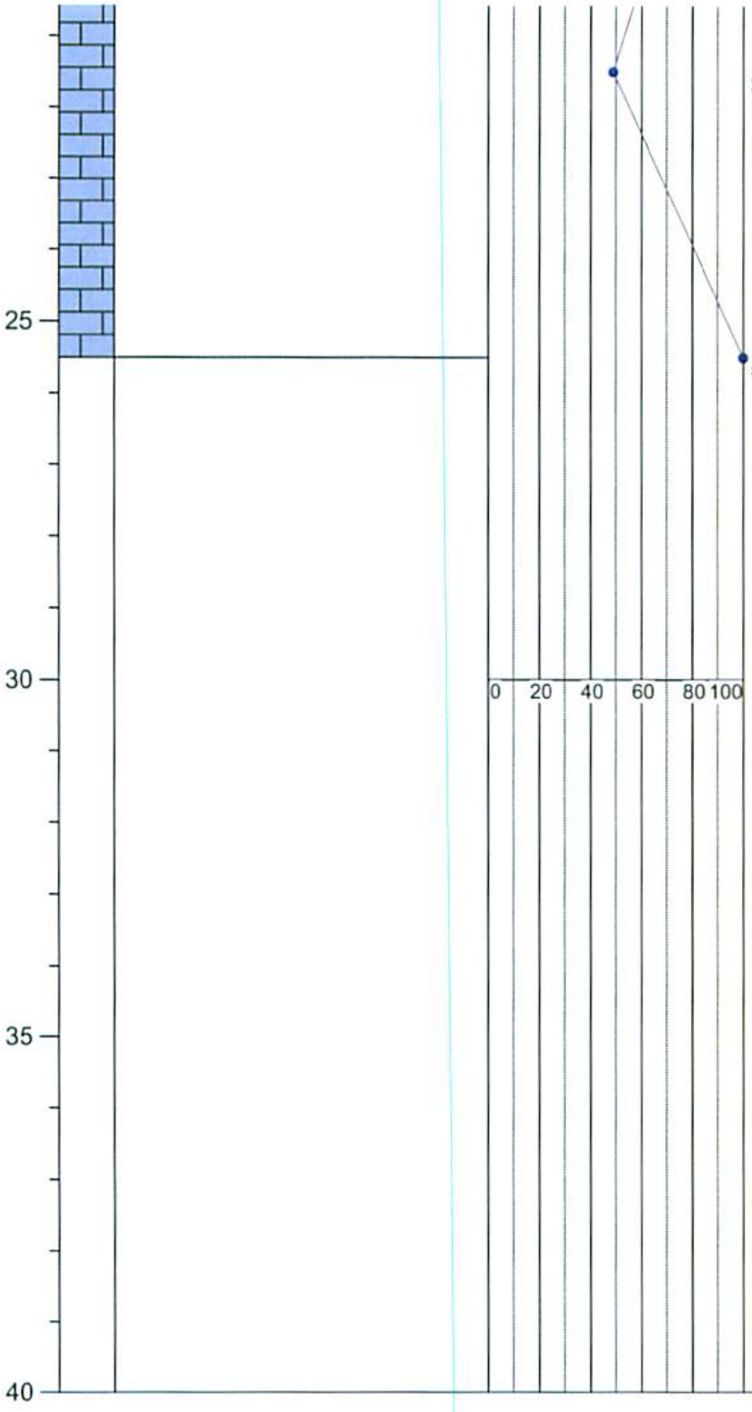
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/29/12	SB-22
DRAWN BY:	MVK	PAGE NO:	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			21/36/13/9	49		
						Drilled hard from 23 ft. to end of boring
			50+	100+		50 blows for 4 inches of penetration @ 25 ft. TOB @ 25.5 ft. bls. Grouted borehole

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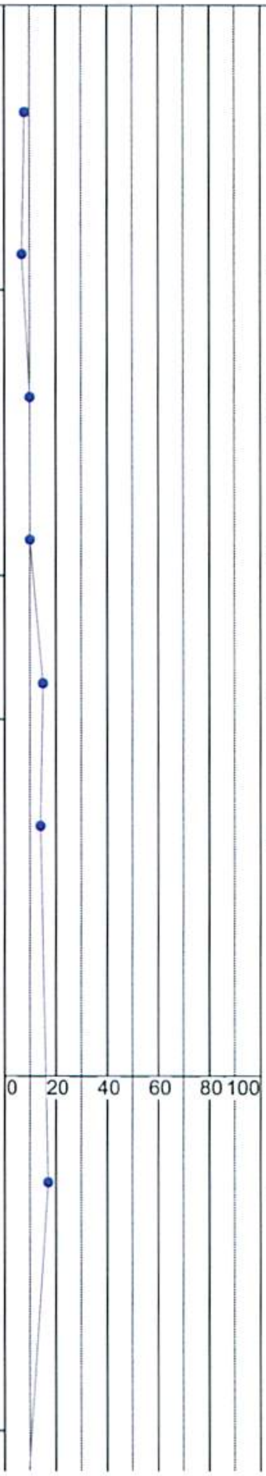
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/29/12	SB-22
DRAWN BY:	MVK	PAGE NO:	2 of 2	

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Mottled very-pale-brown (10YR 7/4) and light-brownish-gray (10YR 6/2)fine to medium quartz sand Spooned from 0-4 ft.				NoEV throughout boring
		1/3/5/5	8		EFR @ 2 ft. @ 12 gpm
		3/3/4/4	7		
5	SILTY SAND (SM): Loose Brown (10YR 4/3) silty fine to medium quartz sand, mottled with Light-yellowish-brown (10YR 6/4) from 7-8 ft. Spooned from 4-8 ft.	3/5/5/7	10		
		4/5/5/9	10		
	POORLY GRADED SAND (SP): Medium dense Light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 8-10 ft.	4/7/8/9	15		
10	POORLY GRADED SAND (SP): Medium dense Mottled light-gray (10YR 7/1) and grayish-brown (10YR 5/2) fine to medium quartz sand Spooned from 10-12 ft. and 15-17 ft.	5/6/8/8	14		
15		7/8/9/12	17		
20	CLAY (CL/CH): Stiff				

PENETRATION
blows per foot



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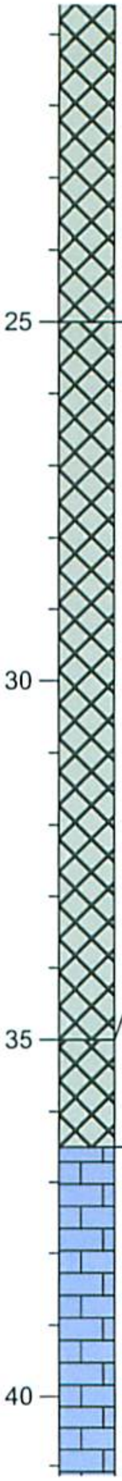
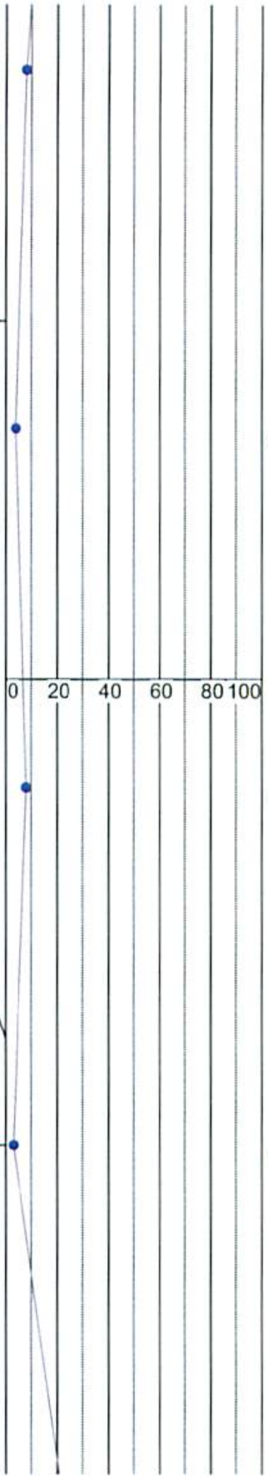
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/29/12	SB-23
DRAWN BY:	MVK	PAGE NO:	1 of 3	





DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Greenish-gray (5G 5/1) clay Spooned from 20-22 ft.		3/4/4/4	8		
25	CLAY (CL/CH): Soft to medium stiff Mottled light-greenish-gray (5G 7/1) and light-brownish-gray (10YR 6/2) sandy clay Spooned from 25-27 ft. and 30-32 ft.		2/2/2/2	4		Casing set to 25 ft. when at 27 ft.
30			3/4/4/5	8		Casing set to 30 ft. when at 32 ft.
35	CLAY (CL/CH): Soft Mottled light-greenish-gray (5G 7/1), light-brownish-gray (10YR 6/2) and yellow (10YR 7/6) clay Spooned from 35-36.5 ft.					
	LIMESTONE: Strong to very strong White (10YR 8/1) limestone Spooned from 36.5-37 ft., 40-42 ft., 45-47 ft. and 50-52 ft.		1/2/1/9	3		Casing set to 35 ft. when at 37 ft. RLOC @ 38.5 ft. DB from 38.5 ft. to end of boring
40						

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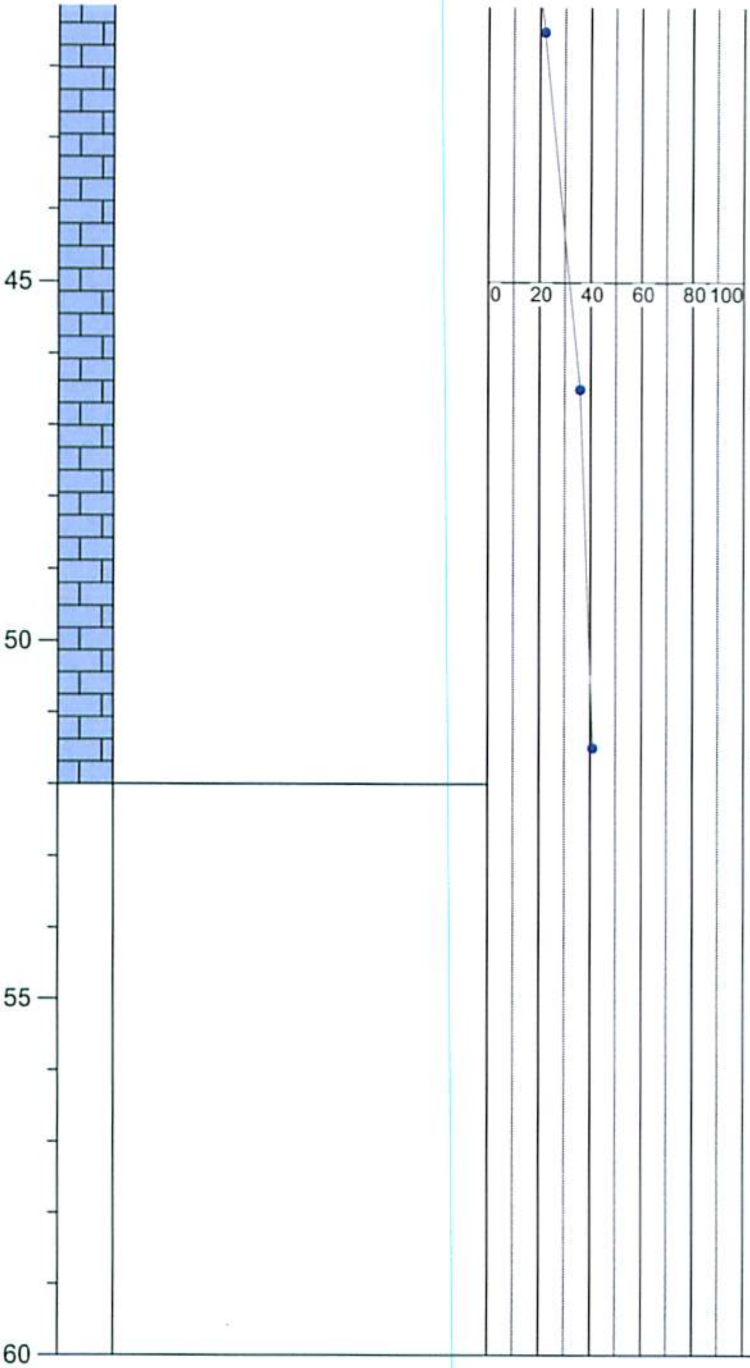
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/29/12	SB-23
DRAWN BY:	MVK	PAGE NO:	2 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			4/5/17/22	22		Casing set to 40 ft. when at 42 ft.
45						Drilled hard from 45 ft. to end of boring
			5/9/27/30	36		
50						
			30/27/14/18	41		TOB @ 52 ft. bls.
						Grouted borehole
55						
60						



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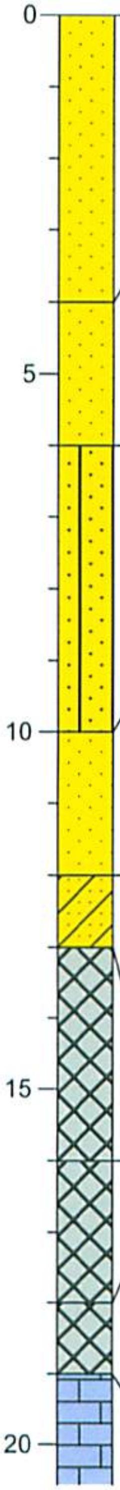
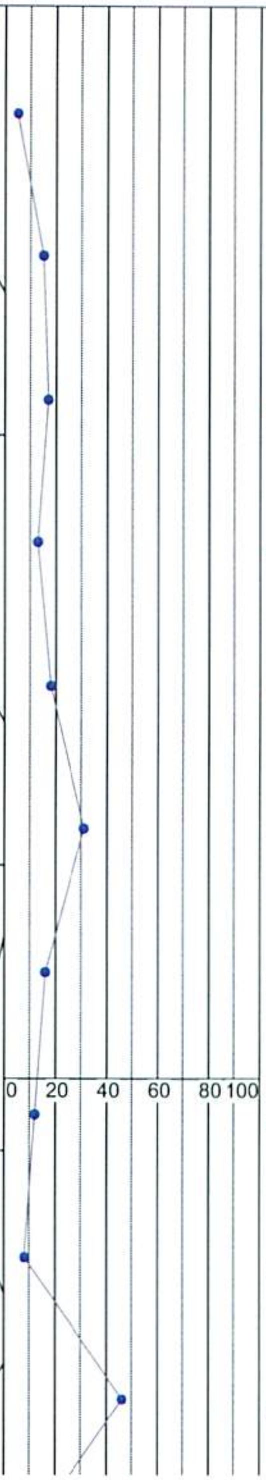
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/29/12	SB-23
DRAWN BY:	MVK	PAGE NO:	3 of 3	





DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
POORLY GRADED SAND (SP): Loose to medium dense Mottled light-yellowish-brown (10YR 6/4) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 0-4 ft.	1/2/3/5 4/7/8/8	5 15		NoEV from 0-25 ft. EFR @ 2 ft. @ 12 gpm
POORLY GRADED SAND (SP): Medium dense Mottled light-brownish-gray (10YR 6/2) and light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 4-6 ft.	4/8/9/11	17		
SILTY SAND (SM): Medium dense Mottled brown (10YR 4/3) and yellowish-brown (10YR 5/4) silty fine to medium quartz sand Spooned from 6-10 ft.	6/6/7/10 4/8/10/15	13 18		
POORLY GRADED SAND (SP): Dense Mottled white (10YR 8/1) and light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 10-12 ft.	10/15/16/17	31		
CLAYEY SAND (SC): Grayish-brown (10YR 5/2) clayey fine to medium quartz sand Spooned from 12-13 ft.				
CLAY (CL/CH): Stiff Mottled light-greenish-gray (5G 7/1) and grayish-brown (10YR 5/2) sandy clay Spooned from 13-16 ft.	5/8/8/9 4/5/7/8	16 12		
CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 16-18 ft.	3/4/4/4	8		
CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 18-19 ft.				Casing set to 15 ft. when at 18 ft.
LIMESTONE: Moderately strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 19-20 ft. Spooned from 19-24 ft.	2/10/36/18	46		RLOC @ 19.5 ft.

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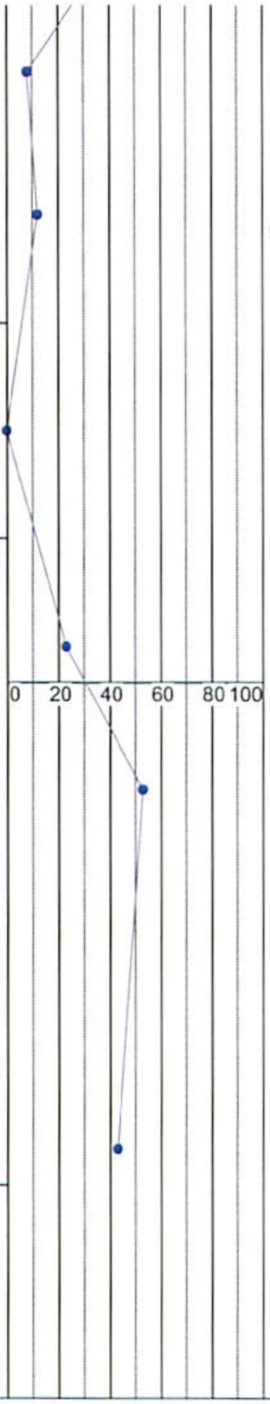
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/30/12	SB-24
DRAWN BY:	MVK	PAGE NO:	1 of 2	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
						DB from 19.5 ft. to end of boring
			1/1/7/9	8		
						Casing set to 20 ft. when at 22 ft.
			4/8/4/5	12		
25						FAS/WOR from 25-27.5 ft.
	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 25-27.5 ft.					
			WOR/WOR/WOR/ WOR	WOR		
						Casing set to 25 ft. when at 27.5 ft.
	LIMESTONE: Strong to extremely strong White (10YR 8/1) limestone Spooned from 28-32 ft. and 35-37 ft.					Drill string advanced under own weight from 27.5-28 ft.
			5/15/8/16	23		
30						NoEV from 28 ft. to end of boring
			22/26/27/29	53		Drilled hard from 28 ft. to end of boring
35						
			10/28/15/48	43		
						TOB @ 37 ft. bls.
						Grouted borehole
40						



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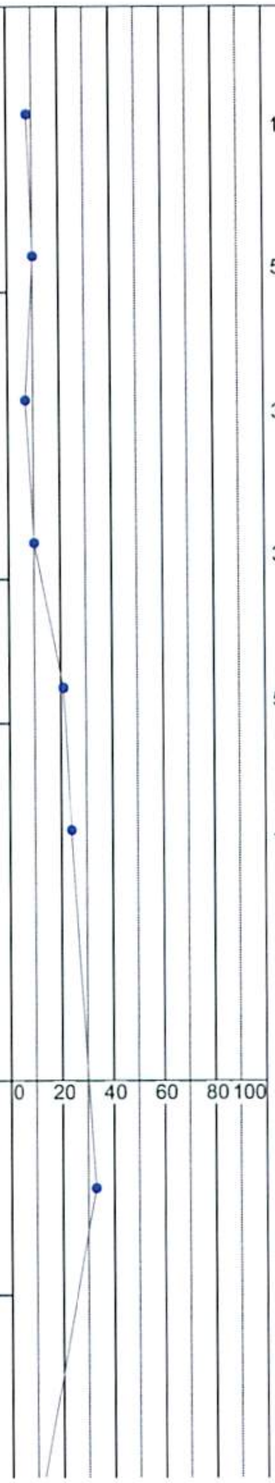
SDII GLOBAL

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/30/12	SB-24
DRAWN BY:	MVK	PAGE NO:	2 of 2	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Mottled light-yellowish-brown (10YR 6/4) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 0-4 ft.		1/4/4/5 5/5/5/5	8 10		NoEV throughout boring EFR @ 2 ft. @ 12 gpm
5	POORLY GRADED SAND (SP): Loose Grayish-brown (10YR 5/2) fine to medium quartz sand Spooned from 4-8 ft.		3/3/4/6 3/4/6/5	7 10		
	SILTY SAND (SM): Medium dense Mottled brown (10YR 4/3) and very-dark-grayish-brown (10YR 3/2) silty fine to medium quartz sand Spooned from 8-10 ft.		5/9/12/13	21		
10	SILTY SAND (SM): Medium dense Mottled yellowish-brown (10YR 5/4) and very-dark-grayish-brown (10YR 3/2) silty fine to medium quartz sand Spooned from 10-12 ft.		7/9/15/14	24		
15	POORLY GRADED SAND (SP): Dense Mottled gray (10YR 6/1), gray (10YR 5/1) and light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 15-17 ft.		9/16/17/20	33		
20	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and light-gray (10YR 7/1) sandy clay Spooned from 20-22 ft.					Drilled hard from 18 ft. to end of boring



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SPT BORING LOG

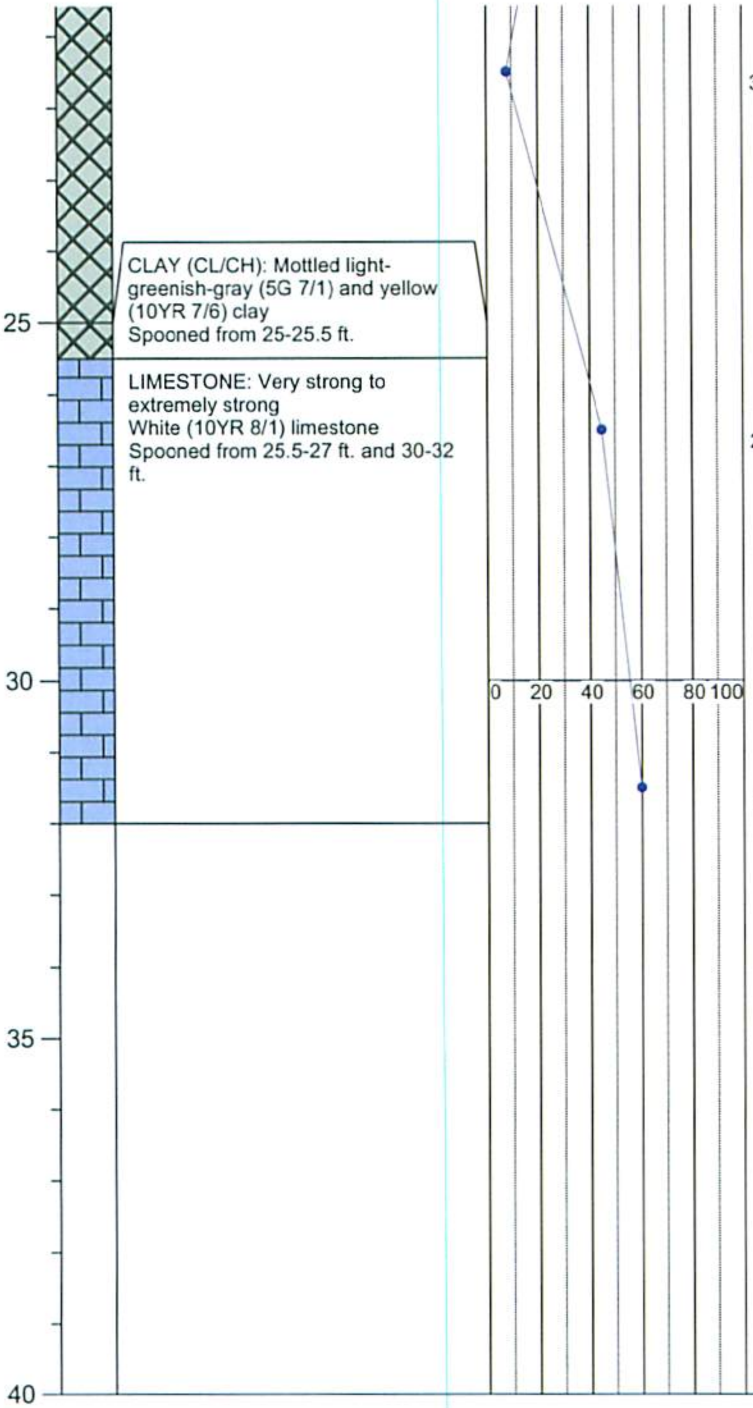
SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 11/30/12
PAGE NO: 1 of 2

BORING
SB-25

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			3/4/4/6	8		Casing set to 20 ft. when at 22 ft.
25	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 25-25.5 ft.					
	LIMESTONE: Very strong to extremely strong White (10YR 8/1) limestone Spooned from 25.5-27 ft. and 30-32 ft.		2/25/20/16	45		Casing set to 25 ft. when at 27 ft. RLOC @ 27.5 ft. DB from 27.5 ft. to end of boring
30			18/22/38/33	60		TOB @ 32 ft. bls. Grouted borehole
35						
40						



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/30/12	SB-25
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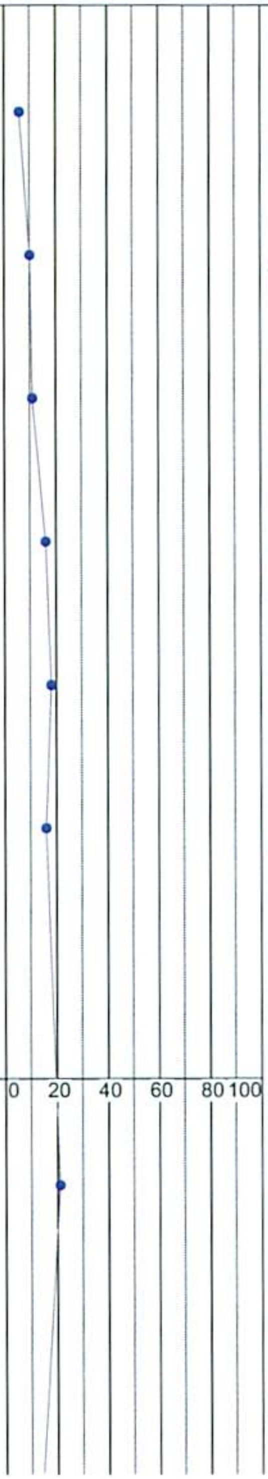

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Mottled light-brownish-gray (10YR 6/2) and light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 0-12 ft.					NoEV throughout boring
			1/2/4/5	6		
						EFR @ 2 ft. @ 12 gpm
			3/4/6/7	10		
5						
			3/5/6/8	11		
			5/6/10/11	16		
			6/8/10/13	18		
10						
			5/7/9/11	16		
15	POORLY GRADED SAND (SP): Medium dense Brown (10YR 4/3) silty fine to medium quartz sand Spooned from 15-17 ft. and 20-22 ft.					
			7/8/13/13	21		
20						

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SPT BORING LOG

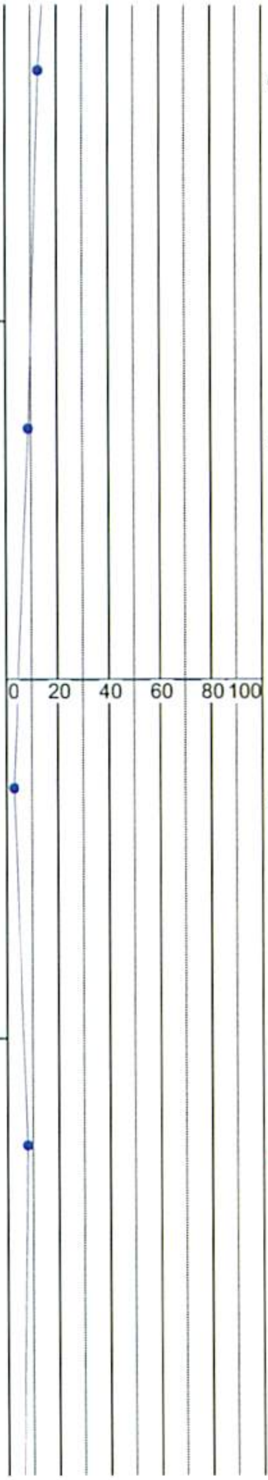
SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 12/03/12
PAGE NO: 1 of 4

BORING
SB-26

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			6/7/6/8	13		
25	SILTY SAND (SM): Very loose to loose Brown (10YR 4/3) silty fine to medium quartz sand Spooned from 25-27 ft. and 30-32 ft.		3/4/5/7	9		Casing set to 25 ft. when at 27 ft.
30			2/1/2/5	3		Casing set to 30 ft. when at 32 ft.
35	POORLY GRADED SAND (SP): Loose Dark-grayish-brown (10YR 4/2) fine to medium quartz sand, mottled with grayish-brown (10YR 5/2) from 40-45 ft. Spooned from 35-37 ft. and 40-42 ft.		2/3/5/5	8		Casing set to 35 ft. when at 37 ft.
40						



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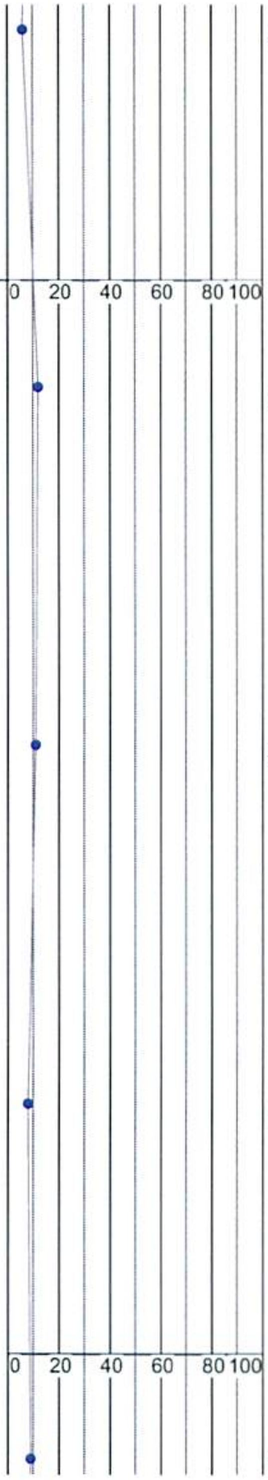
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	12/03/12	SB-26
DRAWN BY:	MVK	PAGE NO:	2 of 4	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			3/3/3/4	6		Casing set to 40 ft. when at 42 ft.
45	POORLY GRADED SAND (SP): Very loose to medium dense Light-yellowish-brown (10YR 6/4) fine to medium quartz sand Spooned from 45-47 ft., 50-52 ft., 55-57 ft., 60-62 ft., 65-67 ft. and 70-72 ft.					
			3/5/7/8	12		Casing set to 45 ft. when at 47 ft.
50						
			3/5/6/6	11		Casing set to 50 ft. when at 52 ft.
55						
			4/3/5/5	8		Casing set to 55 ft. when at 57 ft.
60						Casing set to 60 ft. when at 60 ft.
			4/4/5/5	9		

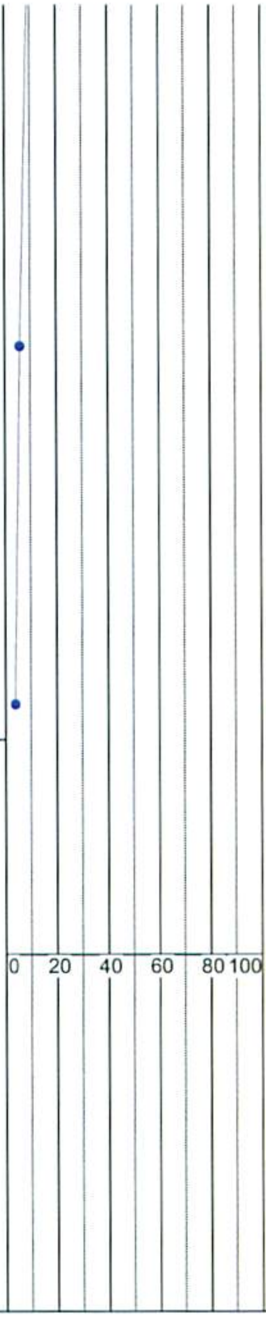


CDM Smith **Tampa, Florida**	**SPT BORING LOG**

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR	PROJECT NO: 8053622	BORING
CHECKED BY: JMW	BORING DATE: 12/03/12	SB-26
DRAWN BY: MVK	PAGE NO: 3 of 4	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
65						
			2/3/3/3	6		
70						
			1/1/3/2	4		
						TOB @ 72 ft. bls.
						Grouted borehole
75						
80						



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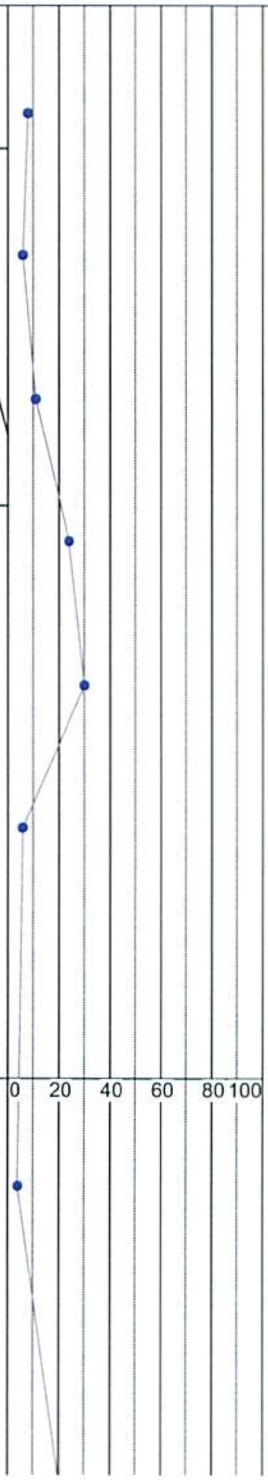
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	12/03/12	SB-26
DRAWN BY:	MVK	PAGE NO:	4 of 4	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	CLAY (CL/CH): Medium stiff Mottled very-pale-brown (10YR 7/3), reddish-brown (5YR 5/3) and yellow (10YR 7/6)sandy clay Spooned from 0-2 ft.		2/4/4/4	8		NoEV throughout boring
	CLAY (CL/CH): Medium stiff to stiff Mottled very-pale-brown (10YR 7/3), reddish-brown (5YR 5/3) and yellow (10YR 7/6) clay Spooned from 2-6 ft.		3/3/3/4	6		EFR @ 2 ft. @ 12 gpm
5						
	LIMESTONE: Mottled very-pale-brown (10YR 7/3) and grayish-brown (10YR 5/2) limestone Spooned from 6-7 ft.		3/5/6/12	11		
	CLAY (CL/CH): Medium stiff to very stiff Mottled very-pale-brown (10YR 7/3) and yellow (10YR 7/6) clay with limestone gravel from 10-15 ft. Spooned from 7-12 ft.		20/14/10/8	24		
			6/14/16/14	30		
10						
						SLOC from 11-12 ft.
			3/2/4/2	6		
						RLOC @ 12 ft.
						DB from 12 ft. to end of boring
						Casing set to 10 ft. when at 12 ft.
15	LIMESTONE: Strong to extremely strong White (10YR 8/1) limestone, mottled with Yellow (10YR 7/6) from 15-17 ft. and 30-30.5 ft. Spooned from 15-17 ft., 20-22 ft., 25-27 ft. and 30-30.5 ft.					Drilled soft from 14-15 ft.
			1/2/2/15	4		
						Casing set to 15 ft. when at 17 ft.
20						

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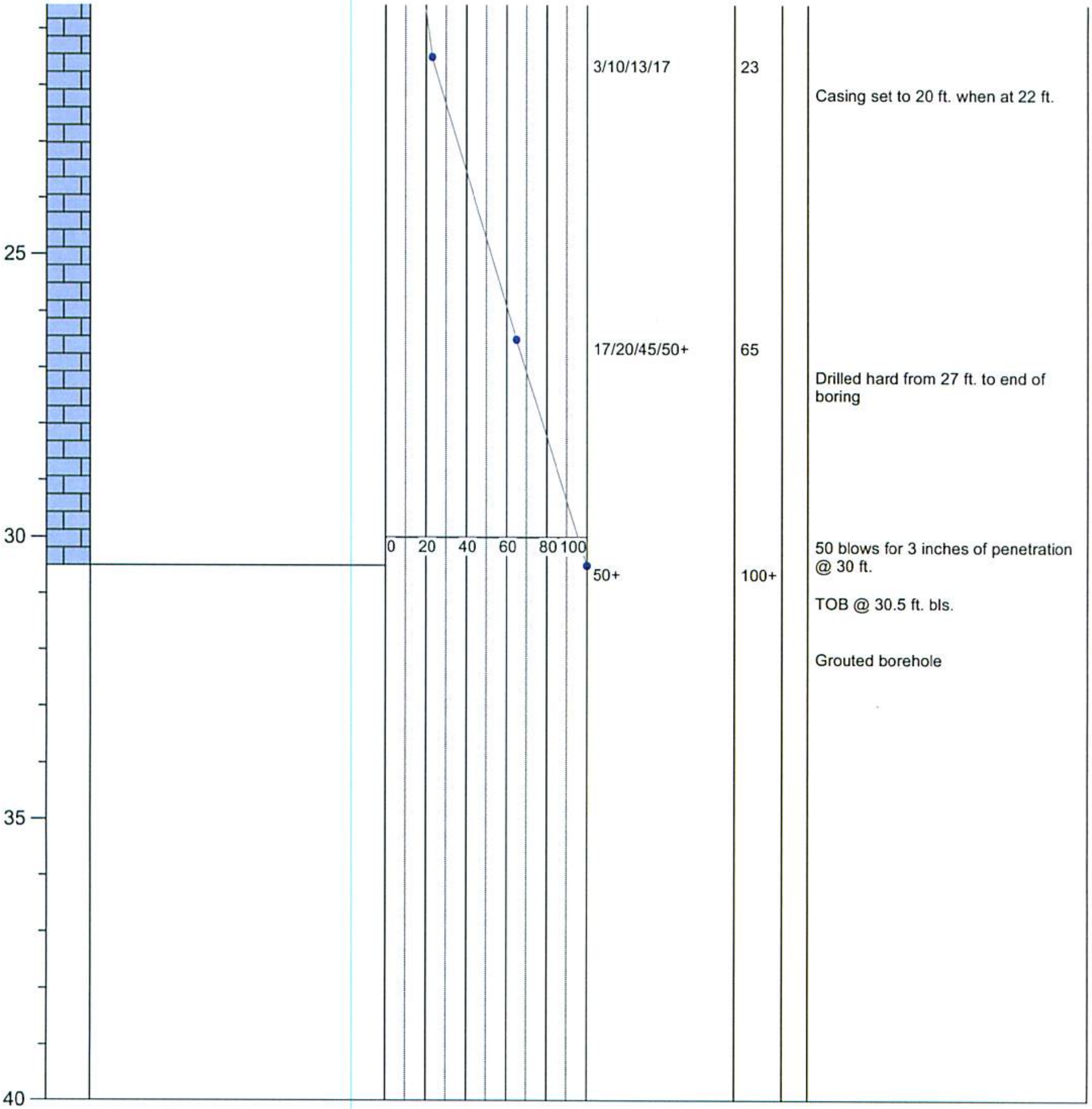
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/20/12	SB-27
DRAWN BY:	MVK	PAGE NO:	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			3/10/13/17	23		Casing set to 20 ft. when at 22 ft.
			17/20/45/50+	65		Drilled hard from 27 ft. to end of boring
			50+	100+		50 blows for 3 inches of penetration @ 30 ft. TOB @ 30.5 ft. bls. Grouted borehole

CDM Smith
Tampa, Florida

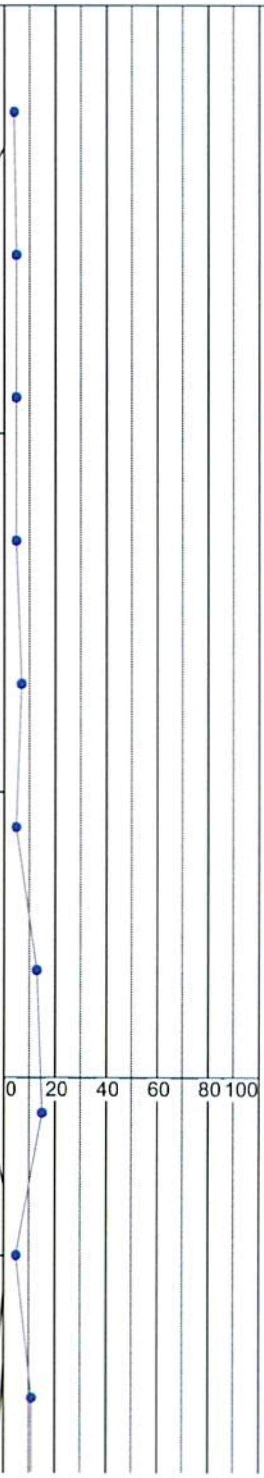
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/20/12	**SB-27**
DRAWN BY:	MVK	PAGE NO:	2 of 2	

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Very loose Mottled light-gray (10YR 7/2) and light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 0-2 ft.	2/2/2/3	4		NoEV throughout boring
	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6) and grayish-brown (10YR 5/2) sandy clay Spooned from 2-6 ft.	2/2/3/4	5		EFR @ 2 ft. @ 12 gpm
5		2/2/3/2	5		
	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel from 10.5-11 ft. Spooned from 6-11 ft.	2/2/3/2	5		
10		2/4/3/4	7		
	LIMESTONE: Moderately strong White (10YR 8/1) limestone Spooned from 11-16.5 ft.	3/3/2/4	5		Casing set to 10 ft. when at 12 ft.
		3/7/6/4	13		RLOC @ 13 ft. DB from 13-22 ft.
15		11/7/8/5	15		
	CLAY (CL/CH): Medium stiff Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) clay Spooned from 16.5-17.5 ft.				
	POORLY GRADED SAND (SP): Mottled white (10YR 8/1) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 17.5-18 ft.	1/1/4/5	5		Casing set to 15 ft. when at 18 ft.
20	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay	3/3/8/9	11		

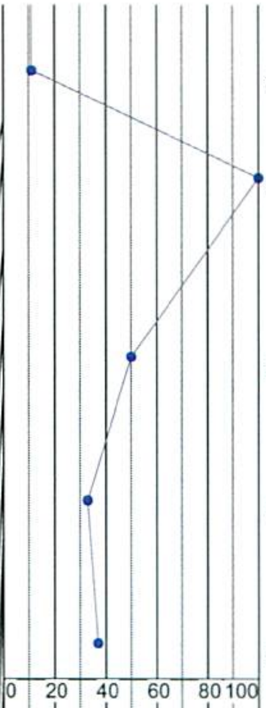
PENETRATION blows per foot



CDM Smith **Tampa, Florida**		**SPT BORING LOG**

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	**PROJECT NO:**	8053622	**BORING**
CHECKED BY:	JMW	**BORING DATE:**	12/04/12	**SB-28**
DRAWN BY:	MVK	**PAGE NO:**	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Spooned from 18-19 ft.					
	POORLY GRADED SAND (SP): Medium dense Light-greenish-gray (5G 7/1) fine to medium quartz sand Spooned from 19-22.2 ft.		3/5/6/5	11		Casing set to 20 ft. when at 22 ft.
	CLAY (CL/CH): Light-greenish-gray (5G 7/1) clay Spooned from 22.2-22.7 ft.		3/50+	100+		EFR @ 22 ft. @ 12 gpm 50 blows for 5 inches of penetration @ 22.5 ft.
25	LIMESTONE: Extremely strong White (10YR 8/1) limestone Spooned from 22.7-23 ft.					Drilled hard from 23-24 ft.
	POORLY GRADED SAND (SP): Light-greenish-gray (5G 7/1) fine to medium quartz sand Spooned from 24-25 ft.		35/19/31/38	50		RLOC @ 24 ft. DB from 24 ft. to end of boring
	LIMESTONE: White (10YR 8/1) limestone Spooned from 25-26 ft.		13/21/12/15	33		
	POORLY GRADED SAND (SP): Light-greenish-gray (5G 7/1) fine to medium quartz sand Spooned from 26-27 ft.		26/20/17/18	37		
30	LIMESTONE: Light-greenish-gray (5G 7/1) limestone Spooned from 27-28 ft.					TOB @ 30 ft. bls. Grouted borehole
	POORLY GRADED SAND (SP): Light-greenish-gray (5G 7/1) fine to medium quartz sand Spooned from 28-28.5 ft.					
	LIMESTONE: Very strong Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) limestone Spooned from 28.5-30 ft.					
35						
40						

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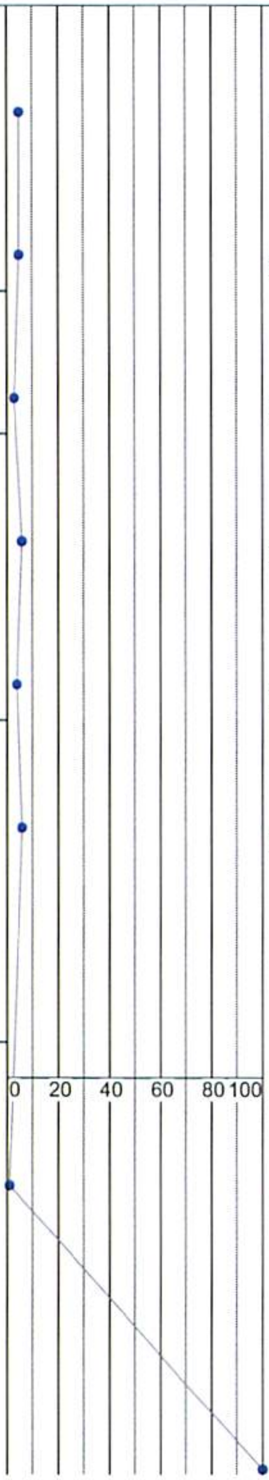
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	12/04/12	SB-28
DRAWN BY:	MVK	PAGE NO:	2 of 2	



DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	CLAY (CL/CH): Medium stiff Mottled light-yellowish-brown (10YR 6/4), yellow (10YR 7/6) and grayish-brown (10YR 5/2) sandy clay Spooned from 0-4 ft.				NoEV from 0-15 ft.
		5/2/3/5	5		EFR @ 2 ft. @ 12 gpm
		2/3/2/4	5		
	CLAY (CL/CH): Soft Mottled brownish-yellow (10YR 6/6) and light-greenish-gray (5G 7/1) clay Spooned from 4-6 ft.				
5		2/1/2/3	3		
	CLAY (CL/CH): Soft to medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 6-10 ft.				
		2/3/3/4	6		
		2/2/2/3	4		
10	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 10-12 ft.				
		2/3/3/4	6		Casing set to 10 ft. when at 12 ft.
					RLOC @ 14.5 ft.
15	LIMESTONE: Weak to extremely strong White (10YR 8/1) limestone Spooned from 15-17 ft., 20-20.5 ft., 25-27 ft. and 30-32 ft.				DB from 14.5-20.5 ft.
		1/WOH/1/1	1		SLO/WOH from 15.5-16 ft.
					Drilled hard from 19-25 ft.
20					NoEV from 20 ft. to end of boring

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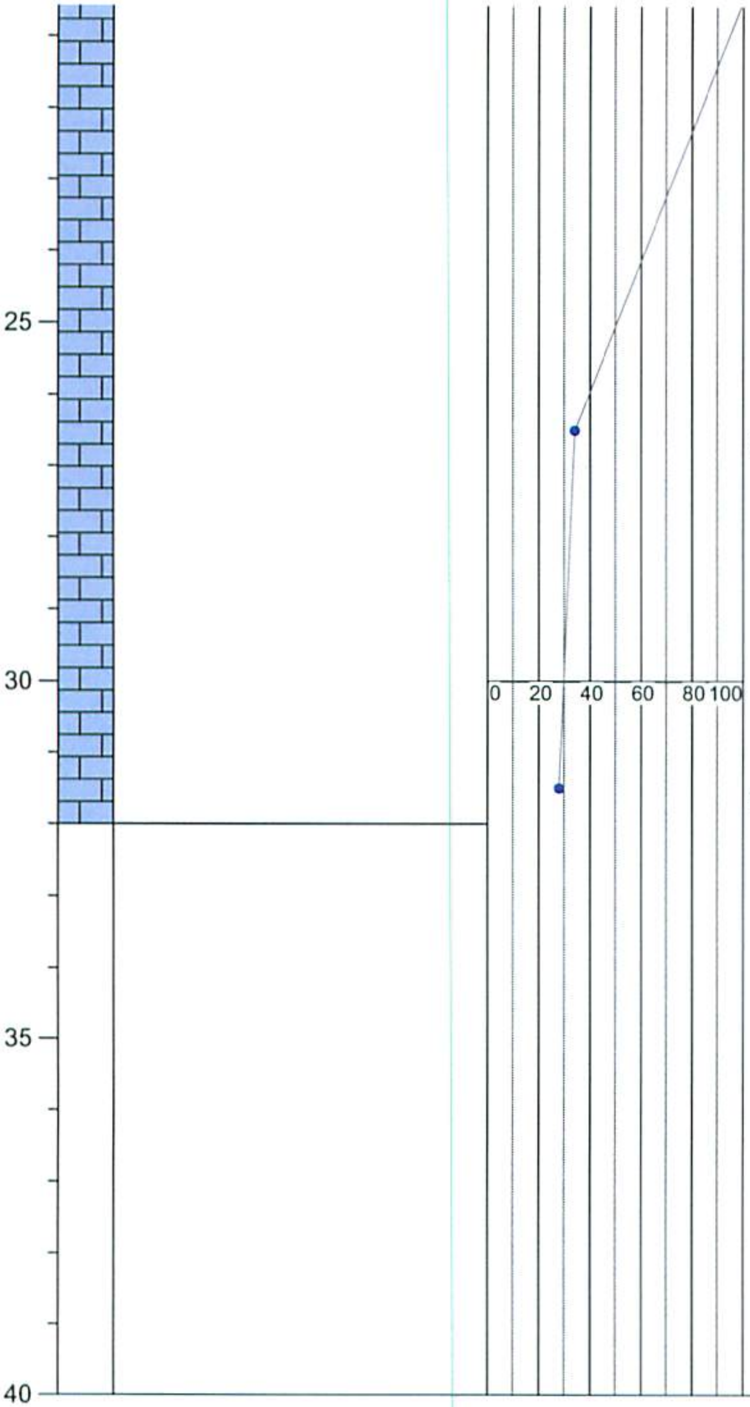
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	12/04/12	**SB-29**
DRAWN BY:	MVK	PAGE NO:	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
						Casing set to 20 ft. when at 20.5 ft.
						EFR @ 20.5 ft. @ 12 gpm
						RLOC @ 23.5 ft.
						DB from 23.5 ft. to end of boring
			17/16/18/12	34		
			9/15/13/14	28		
						TOB @ 32 ft. bls.
						Grouted borehole

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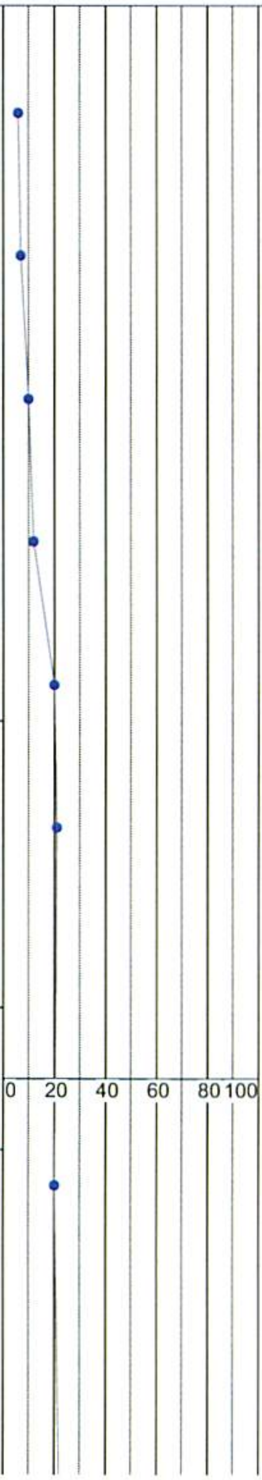
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	12/04/12	SB-29
DRAWN BY:	MVK	PAGE NO:	2 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Mottled light-gray (10YR 7/2) and light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 0-10 ft.					NoEV throughout boring
			1/3/3/4	6		EFR @ 2 ft. @ 12 gpm
			3/4/3/4	7		
5			2/4/6/5	10		
			4/6/6/8	12		
			7/9/11/13	20		
10	POORLY GRADED SAND (SP): Medium dense Mottled light-brownish-gray (10YR 6/2) and very-pale-brown (10YR 7/3) fine to medium quartz sand Spooned from 10-12 ft.					
			6/9/12/17	21		
15	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6), dark-brown (10YR 3/3) and light-gray (10YR 7/2) clay Spooned from 15-16 ft.					
	POORLY GRADED SAND (SP): Medium dense Light-gray (10YR 7/2) fine to medium quartz sand, mottled with brown (10YR 5/3) from 16-30 ft. Spooned from 16-17 ft., 20-22 ft., 25-27 ft. and 30-32 ft.		5/9/11/14	20		Casing set to 15 ft. when at 17 ft.
20						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/20/12	SB-30
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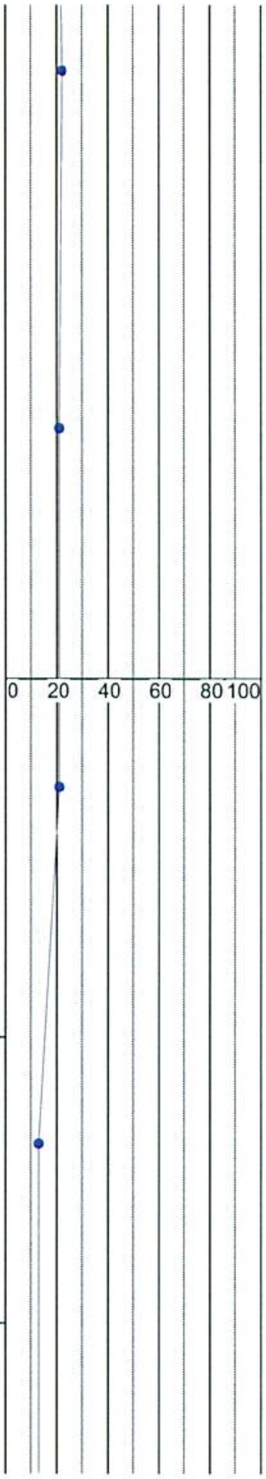

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			7/10/12/14	22		Casing set to 20 ft. when at 22 ft.
25						
			6/10/11/13	21		Casing set to 25 ft. when at 27 ft.
30						
			7/10/11/15	21		Casing set to 30 ft. when at 32 ft.
35	SILTY SAND (SM): Medium dense Yellowish-brown (10YR 5/4) silty fine to medium quartz sand Spooned from 35-37 ft.		6/6/7/11	13		Casing set to 35 ft. when at 37 ft.
40	CLAY (CL/CH): Stiff Mottled light-gray (10YR 7/2), yellow (10YR 7/6) and light-greenish-gray (5G 7/1) sandy clay Spooned from 40-42 ft. and 45-46 ft.					

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
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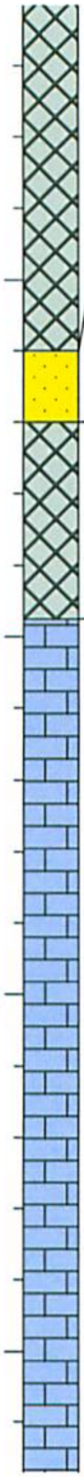
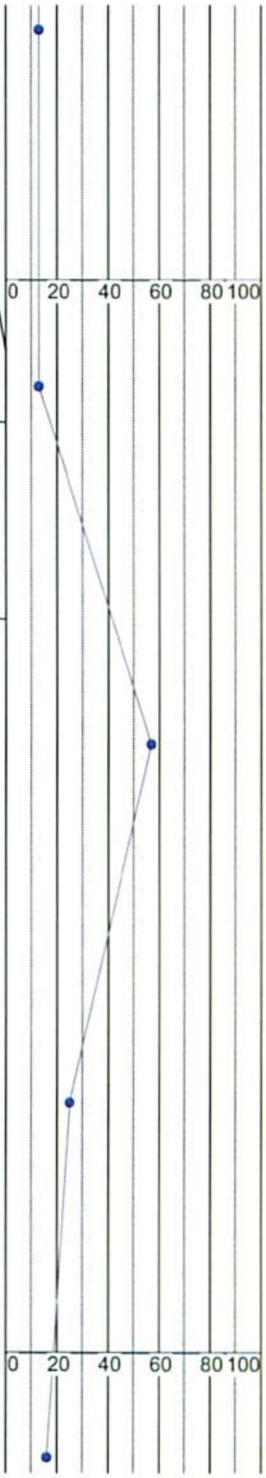
PROJECT NO: 8053622
BORING DATE: 11/20/12
PAGE NO: 2 of 4

BORING
SB-30





DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			2/6/7/5	13		
						Casing set to 40 ft. when at 42 ft.
45	POORLY GRADED SAND (SP): Mottled light-gray (10YR 7/2) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 46-47 ft.					
			6/5/8/9	13		
						Casing set to 45 ft. when at 47 ft.
	CLAY (CL/CH): Sandy clay Interval not spooned; lithology based on drilling returns					
50	LIMESTONE: Strong to extremely strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 55-57 ft. Spooned from 50-52 ft., 55-57 ft. and 60-62 ft.					
			31/33/24/26	57		
						Casing set to 50 ft. when at 52 ft.
						RLOC @ 54 ft.
55						DB from 54 ft. to end of boring
			5/12/13/4	25		
60						
			12/8/8/8	16		

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SPT BORING LOG

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SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/20/12	SB-30
DRAWN BY:	MVK	PAGE NO:	3 of 4	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
						TOB @ 62 ft. bls.
						Grouted borehole
65						
70						
75		0 20 40 60 80 100				
80						

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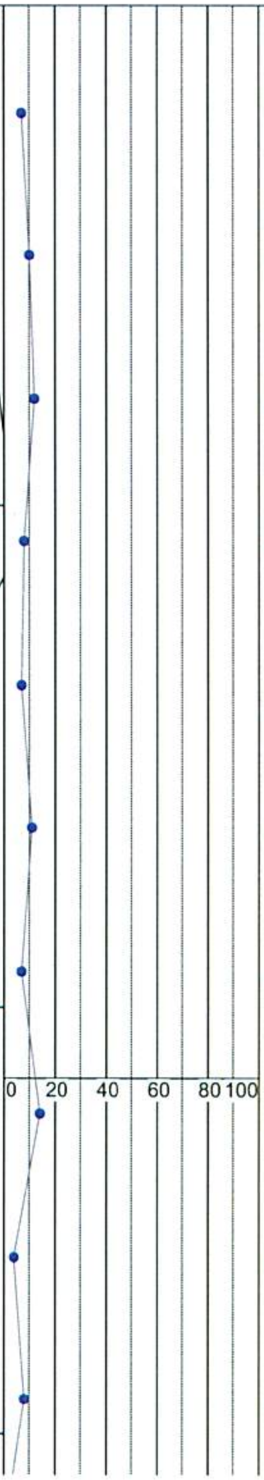
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR	PROJECT NO: 8053622	BORING
CHECKED BY: JMW	BORING DATE: 11/20/12	SB-30
DRAWN BY: MVK	PAGE NO: 4 of 4	



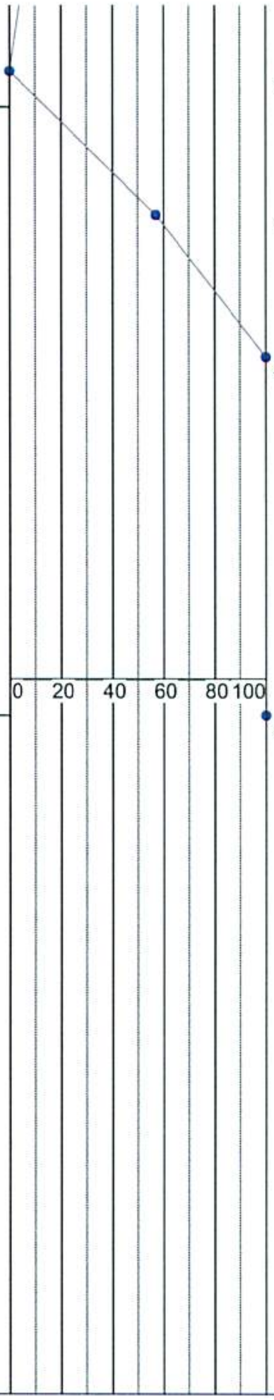
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Mottled light-yellowish-brown (10YR 6/4), yellow (10YR 7/6) and light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 0-6 ft.					NoEV from 0-16 ft.
			1/2/5/4	7		EFR @ 2 ft. @ 12 gpm
			6/5/5/6	10		
5	POORLY GRADED SAND (SP): Mottled light-brownish-gray (10YR 6/2), light-yellowish-brown (10YR 6/4) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 6-7 ft.		4/6/6/8	12		
	CLAY (CL/CH): Light-greenish-gray (5G 7/1) sandy clay Spooned from 7-8 ft.		5/4/4/5	8		
	CLAY (CL/CH): Medium stiff to stiff Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6) and brown (10YR 5/3) clay Spooned from 8-14 ft.		3/3/4/4	7		
10						
			3/5/6/9	11		Casing set to 10 ft. when at 12 ft.
			3/2/5/1	7		RLOC @ 14 ft.
	LIMESTONE: Weak to moderately strong White (10YR 8/1) limestone Spooned from 14-20 ft.					
15						DB from 14 ft. to end of boring
			1/4/10/7	14		
						SLO/WOH from 17-17.5 ft.
			1/4/WOH/4	4		Casing set to 15 ft. when at 18 ft.
						FAS/WOR from 18-19 ft.
			WOR/WOR/8/1	8		
20	CLAYEY SAND (SC): Very loose					Drilled soft from 20-22 ft.

CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	**PROJECT NO:**	8053622	**BORING**
CHECKED BY:	JMW	**BORING DATE:**	12/03/12	**SB-31**
DRAWN BY:	MVK	**PAGE NO:**	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 20-22 ft.		1/WOH/WOH/3	WOH		FAS/WOH from 20.5-21.5 ft.
	LIMESTONE: Extremely strong White (10YR 8/1) limestone Spooned from 22-24 ft., 25-25.5 ft., and 30-30.5 ft.					Casing set to 20 ft. when at 22 ft. NoEV from 22 ft. to end of boring
			7/16/41/30	57		Drilled hard from 24 ft. to end of boring
25			50	100		
30			50	100		Casing set to 25 ft. when at 30 ft. TOB @ 30.5 ft. bls. Grouted borehole
35						
40						

CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 12/03/12
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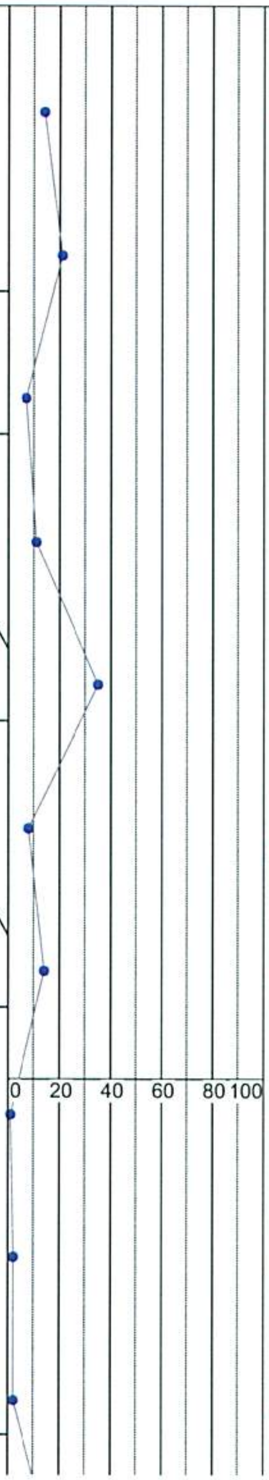
BORING **SB-31**

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	CLAYEY SAND (SC): Medium dense Mottled light-yellowish-brown (10YR 6/4) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 0-4 ft.	5/7/7/6	14		NoEV from 0-14 ft. EFR @ 2 ft. @ 12 gpm
		4/10/11/8	21		
5	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 4-6 ft.	2/3/4/5	7		
	CLAY (CL/CH): Stiff Light-gray (10YR 7/1) sandy clay Spooned from 6-9 ft.	4/6/5/7	11		
	LIMESTONE: Mottled white (10YR 8/1) and yellow (10YR 7/6) limestone Spooned from 9-10 ft.	3/16/19/8	35		
10	CLAY (CL/CH): Medium stiff Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) sandy clay Spooned from 10-13 ft.	2/3/5/9	8		Casing set to 10 ft. when at 12 ft.
	LIMESTONE: White (10YR 8/1) limestone Spooned from 13-14 ft.	5/9/5/3	14		SLO/WOH from 14-14.5 ft.
15	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel Spooned from 14-20 ft.	WOH/1/WOH/1	1		SLO/WOH from 15-15.5 ft. NoEV from 16 ft. to end of boring
		1/1/1/5	2		Casing set to 15 ft. when at 18 ft. RLOC @ 18 ft.
		1/1/1/7	2		DB from 18 ft. to end of boring
20	LIMESTONE: White (10YR 8/1)				

PENETRATION
blows per foot



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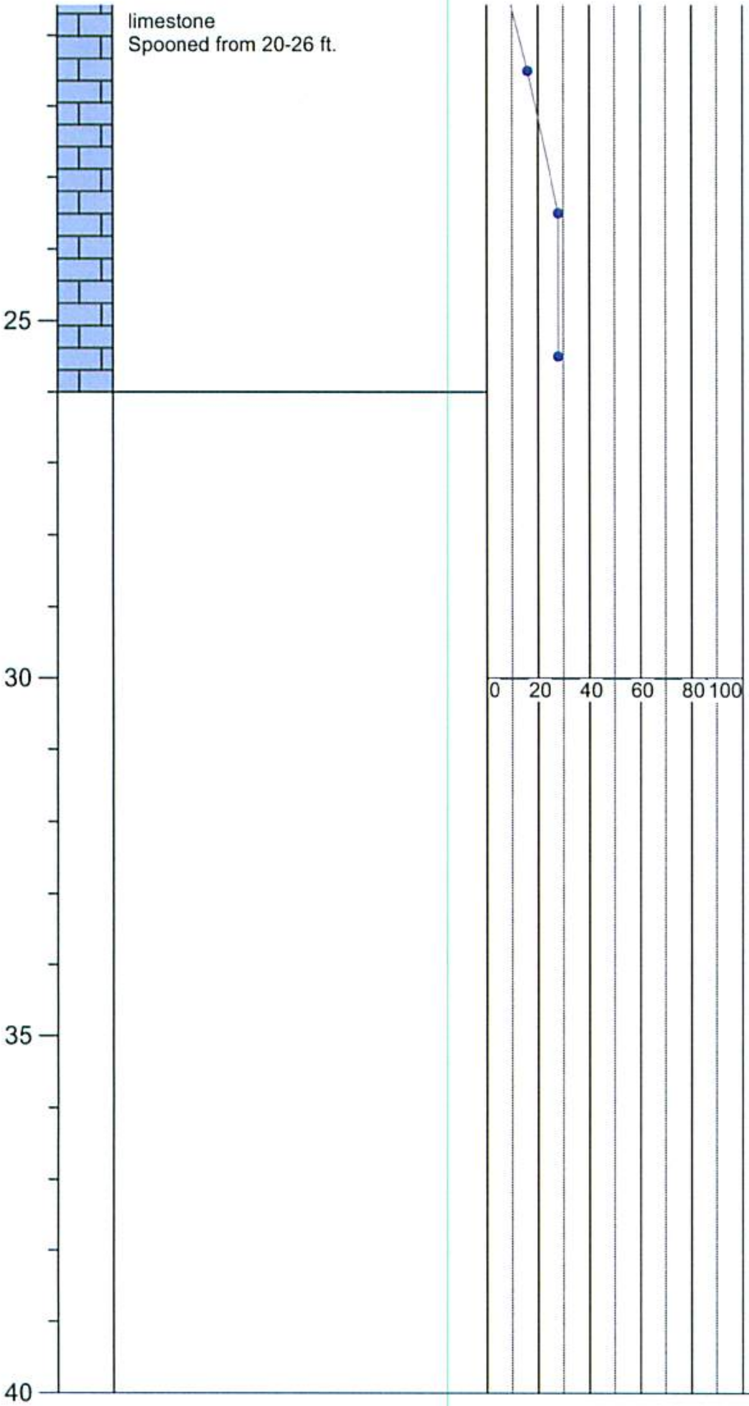
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	12/04/12	SB-32
DRAWN BY:	MVK	PAGE NO:	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	limestone Spooned from 20-26 ft.					Casing set to 20 ft. when at 22 ft.
			3/4/12/11	16		
						Drilled hard from 22 ft. to end of boring
			8/12/16/16	28		
			4/10/18/24	28		
						TOB @ 26 ft. bls.
						Grouted borehole

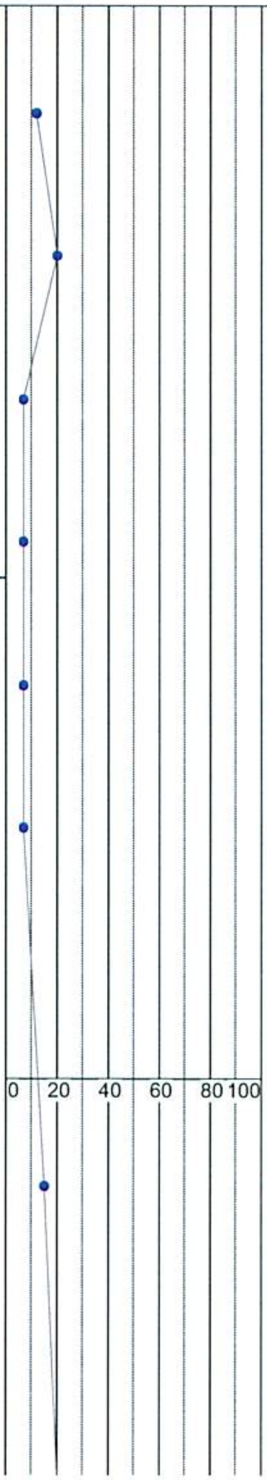
CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	12/04/12	SB-32
DRAWN BY:	MVK	PAGE NO:	2 of 2	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Very-pale-brown (10YR 7/3) fine to medium quartz sand Spooned from 0-8 ft.					NoEV throughout boring
			2/4/8/13	12		EFR @ 2 ft. @ 12 gpm
			8/10/10/8	20		
5						
			3/3/4/4	7		
			3/3/4/3	7		
	POORLY GRADED SAND (SP): Loose to medium dense Light-brownish-gray (10YR 6/2) fine to medium quartz sand, mottled with Brown (10YR 5/3) from 30-31 ft. Spooned from 8-12 ft., 15-17 ft., 20-22 ft., 25-27 ft. and 30-31 ft.					
			2/4/3/4	7		
10						
			2/3/4/6	7		
15						
			5/6/9/11	15		
20						



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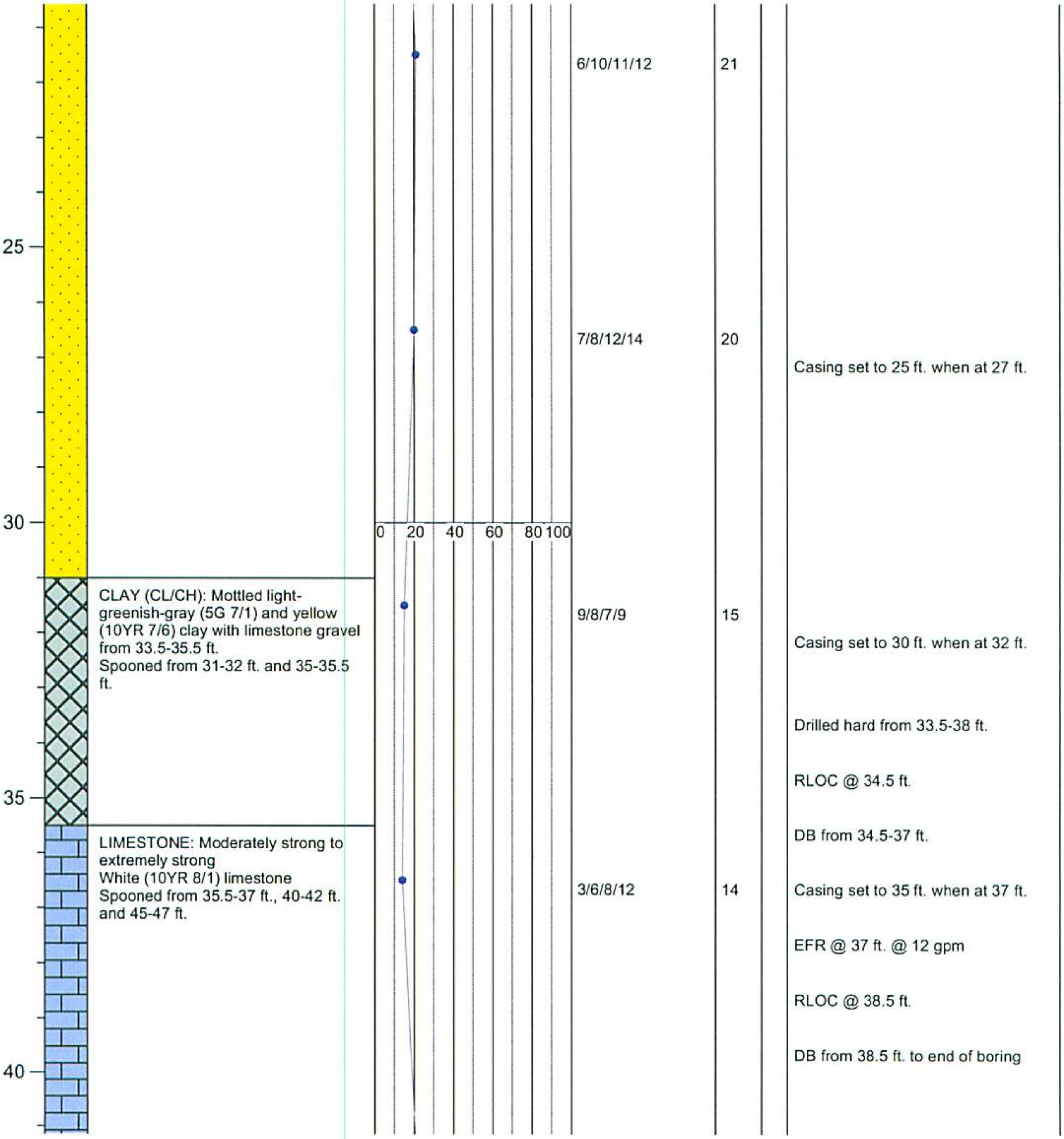
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/26/12	SB-33
DRAWN BY:	MVK	PAGE NO:	1 of 3	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			6/10/11/12	21		
25						
			7/8/12/14	20		
						Casing set to 25 ft. when at 27 ft.
30		0 20 40 60 80 100				
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel from 33.5-35.5 ft. Spooned from 31-32 ft. and 35-35.5 ft.		9/8/7/9	15		
						Casing set to 30 ft. when at 32 ft.
						Drilled hard from 33.5-38 ft.
						RLOC @ 34.5 ft.
35						
	LIMESTONE: Moderately strong to extremely strong White (10YR 8/1) limestone Spooned from 35.5-37 ft., 40-42 ft. and 45-47 ft.					DB from 34.5-37 ft.
			3/6/8/12	14		Casing set to 35 ft. when at 37 ft.
						EFR @ 37 ft. @ 12 gpm
						RLOC @ 38.5 ft.
						DB from 38.5 ft. to end of boring
40						

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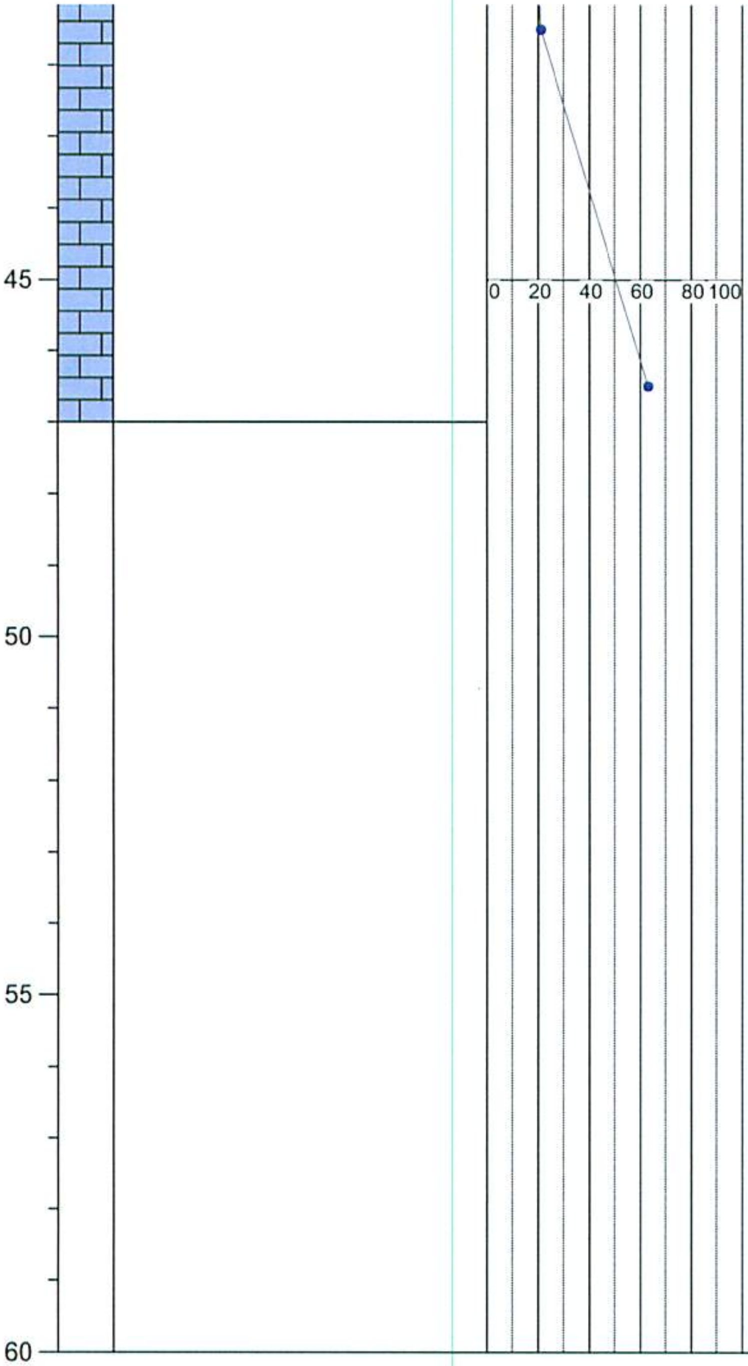
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR	PROJECT NO: 8053622	BORING
CHECKED BY: JMW	BORING DATE: 11/26/12	SB-33
DRAWN BY: MVK	PAGE NO: 2 of 3	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			6/5/16/13	21		Casing set to 40 ft. when at 42 ft.
			33/33/30/25	63		TOB @ 47 ft. bls. Grouted borehole

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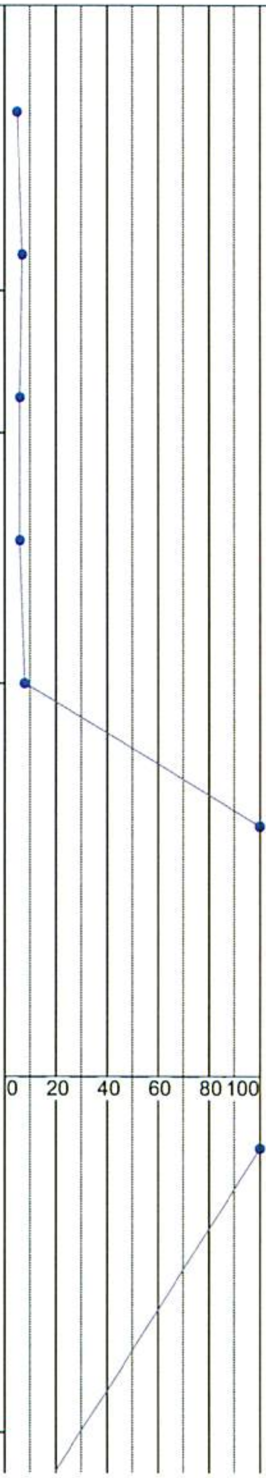
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING	
CHECKED BY:	JMW	BORING DATE:	11/26/12	SB-33	
DRAWN BY:	MVK	PAGE NO:	3 of 3		



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Light-yellowish-brown (10YR 6/4) fine to medium quartz sand, mottled with Yellow (10YR 7/6) from 2.5-4 ft. Spooned from 0-4 ft.		2/2/3/3	5		NoEV from 0-25 ft.
			3/2/5/4	7		
5	CLAY (CL/CH): Medium stiff Mottled very-pale-brown (10YR 7/3), yellow (10YR 7/6) and light-gray (10YR 7/1) sandy clay Spooned from 4-6 ft.		2/3/3/4	6		
	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 6-9.5 ft.		2/3/3/4	6		
10	LIMESTONE: Extremely strong Mottled white (10YR 8/1) and yellow (10YR 7/6) limestone Spooned from 9.5-11.5 ft. and 15-16 ft.		3/4/4/50	8		
			30/32/50+	100+		EFR @ 2 ft. @ 12 gpm 50 blows for 3 inches of penetration @ 11 ft. Casing set to 10 ft. when at 11.5 ft.
15						Drilled hard from 13-14 ft.
			25/50	100		RLOC @ 13.5 ft. DB from 13.5 ft. to end of boring Drilled hard from 15-17 ft. Casing set to 15 ft. when at 16 ft.
20	CLAY (CL/CH): Soft					

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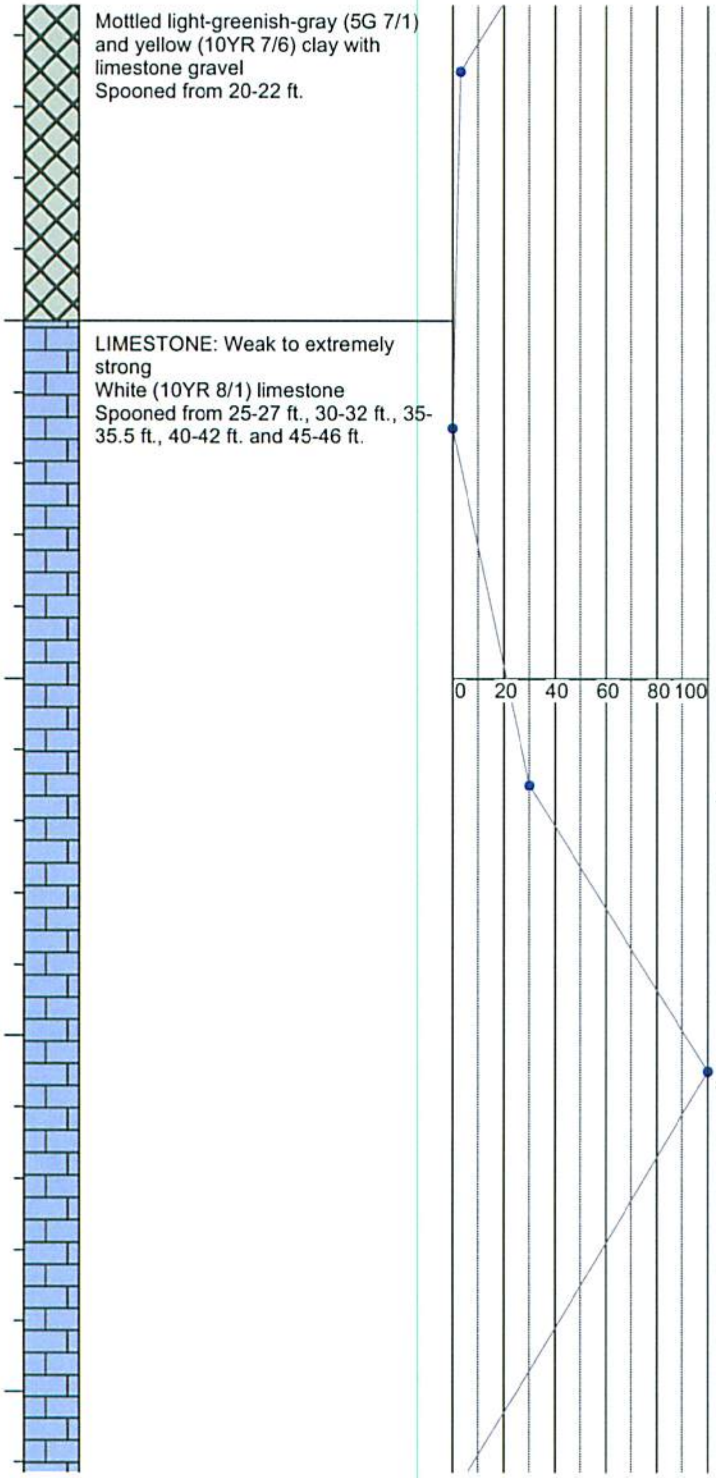
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-34
DRAWN BY:	MVK	PAGE NO:	1 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel Spooned from 20-22 ft.		1/1/2/2	3		Casing set to 20 ft. when at 22 ft.
25	LIMESTONE: Weak to extremely strong White (10YR 8/1) limestone Spooned from 25-27 ft., 30-32 ft., 35-35.5 ft., 40-42 ft. and 45-46 ft.		1/WOH/WOH/WOH	WOH		Drilled soft from 25-28 ft. SLO/WOH from 25.5-27 ft.
30			3/2/28/48	30		NoEV from 30-40 ft. Casing set to 30 ft. when at 32 ft.
35			50	100		
40						Drilled soft from 39-42 ft. SLO/WOR from 40-41 ft., then SLO/WOH from 41-41.5 ft.



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-34
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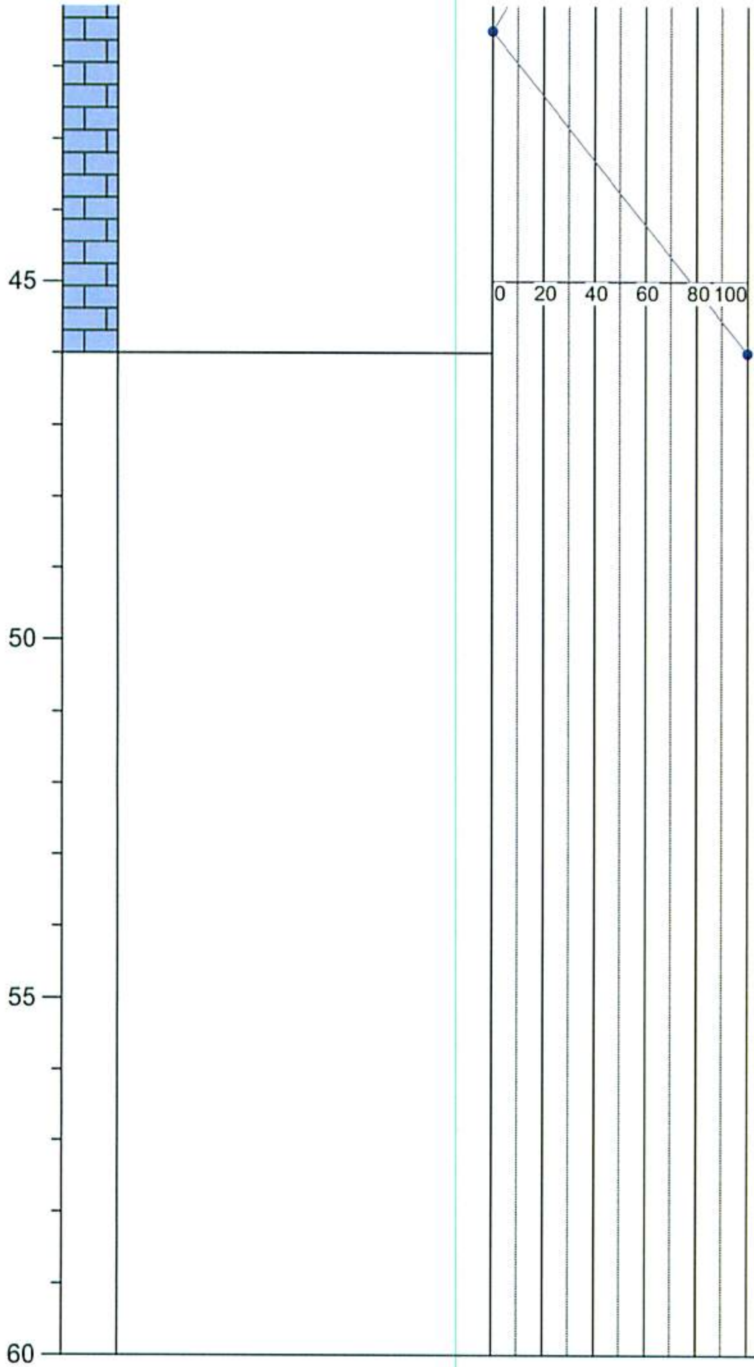
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			WOR/WOR/WOH/5	WOH		Casing set to 40 ft. when at 42 ft.
45						NoEV @ 45 ft.
			20/50+	100+		50 blows for 3 inches of penetration @ 45.5 ft. TOB @ 46 ft. bls. Grouted borehole



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/14/12	SB-34
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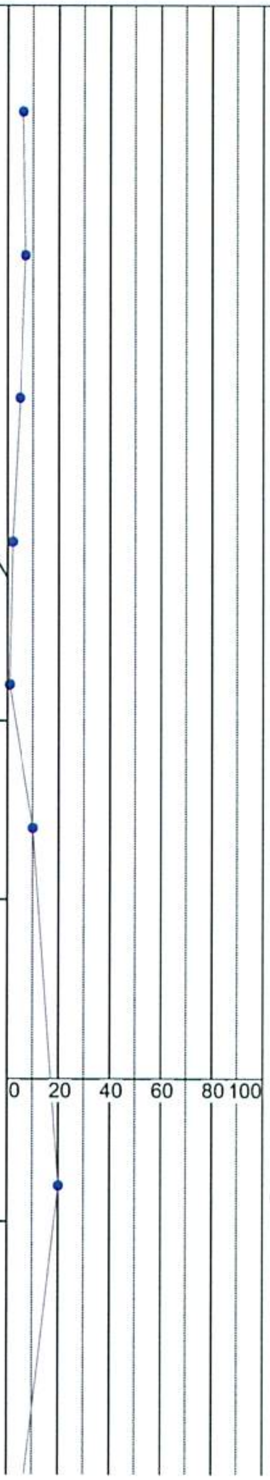

DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Very loose to loose Mottled grayish-brown (10YR 5/2) and brown (10YR 5/3) fine to medium quartz sand Spooned from 0-8 ft.				NoEV from 0-8 ft.
		1/3/3/3	6		EFR @ 2 ft. @ 12 gpm
		3/3/4/4	7		
5		3/2/3/2	5		
		1/1/1/1	2		
	CLAYEY SAND (SC): Very loose Mottled light-greenish-gray (5G 7/1), light-gray (10YR 7/1) and light-brownish-gray (10YR 6/2) clayey fine to medium quartz sand Spooned from 8-10 ft.				SLO/WOH from 8.5-9 ft.
		1/WOH/1/1	1		
10	CLAY (CL/CH): Stiff Mottled light-gray (10YR 7/1), yellow (10YR 7/6) and light-greenish-gray (5G 7/1) sandy clay Spooned from 10-12 ft.				NoEV from 10-20 ft. Casing set to 10 ft. when at 10 ft.
		1/4/6/4	10		
	LIMESTONE: Strong Mottled light-gray (10YR 7/1), light-brownish-gray (10YR 6/2) and light-greenish-gray (5G 7/1) limestone Spooned from 15-17 ft.				RLOC @ 13.5 ft. DB from 13.5 ft. to end of boring
15					
		6/10/10/2	20		
	CLAY (CL/CH): Soft Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6) and light-gray (10YR 7/1) sandy clay Spooned from 20-22 ft.				Drilled soft from 17-25 ft.
20					Casing set to 20 ft. when at 20 ft.

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	**PROJECT NO:**	8053622	**BORING**
CHECKED BY:	JMW	**BORING DATE:**	11/15/12	**SB-35**
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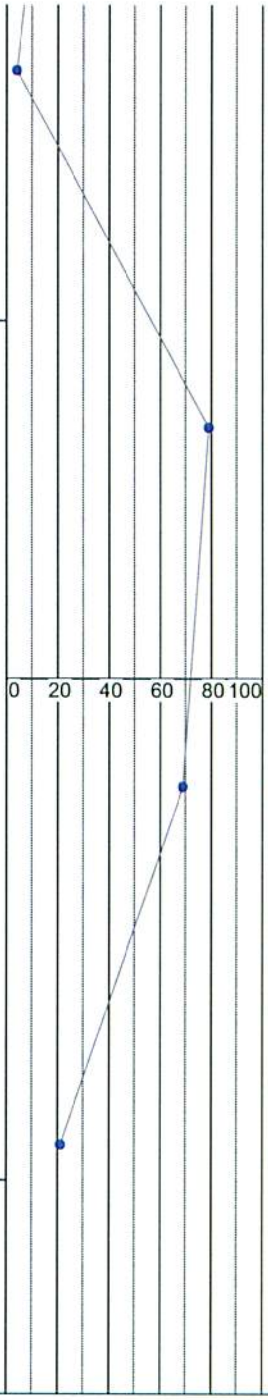
DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
					SLO/WOH from 20-20.5 ft.
		WOH/2/2/1	4		
25	LIMESTONE: Strong to extremely strong White (10YR 8/1) limestone Spooned from 25-27 ft., 30-32 ft. and 35-37 ft.				NoEV from 25 ft. to end of boring
		34/37/42/50	79		Drilled hard from 25 ft. to end of boring Casing set to 25 ft. when at 27 ft.
30					Casing set to 30 ft. when at 30 ft.
		25/46/23/50	69		
35					
		10/14/7/4	21		TOB @ 37 ft. bls. Grouted borehole
40					

PENETRATION
blows per foot



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
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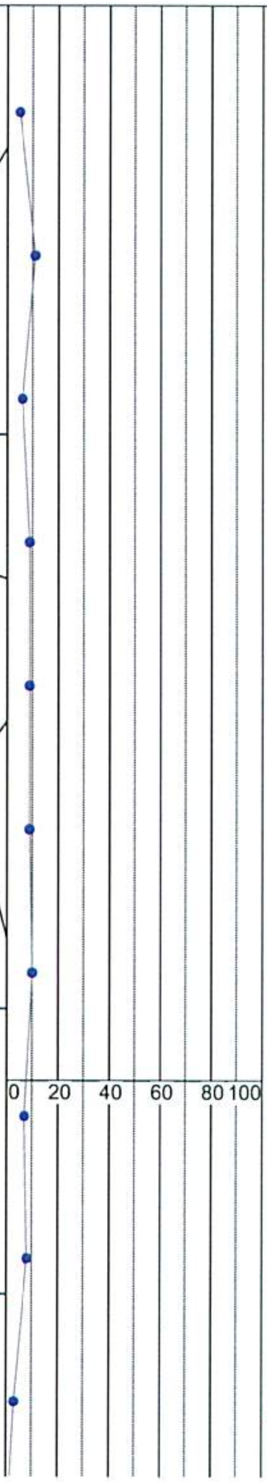
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Mottled light-yellowish-brown (10YR 6/4) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 0-2 ft.		1/1/4/4	5		NoEV from 0-18 ft.
	POORLY GRADED SAND (SP): Loose to medium dense Mottled grayish-brown (10YR 5/2) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 2-6 ft.		4/5/6/6	11		EFR @ 2 ft. @ 12 gpm
5			3/3/3/3	6		
	SILTY SAND (SM): Loose Mottled light-yellowish-brown (10YR 6/4) and yellow (10YR 7/6) silty fine to medium quartz sand Spooned from 6-8 ft.		3/4/5/7	9		
10	POORLY GRADED SAND (SP): Loose Mottled light-yellowish-brown (10YR 6/4) and brown (10YR 5/3) fine to medium quartz sand Spooned from 8-10 ft.		4/4/5/7	9		
	POORLY GRADED SAND (SP): Loose Grayish-brown (10YR 5/2) fine to medium quartz sand Spooned from 10-13 ft.		3/5/4/7	9		
	POORLY GRADED SAND (SP): White (10YR 8/1) fine to medium quartz sand Spooned from 13-14 ft.		4/5/5/6	10		
15	CLAY (CL/CH): Medium stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 14-18 ft.		3/3/4/6	7		
			2/4/4/5	8		
20	CLAY (CL/CH): Loose Mottled light-greenish-gray (5G 7/1), light-gray (10YR 7/1) and yellow (10YR 7/6) sandy clay Spooned from 18-21 ft.		2/2/1/WOH	3		FAS/WOH from 19.5-20 ft.

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/16/12	SB-36
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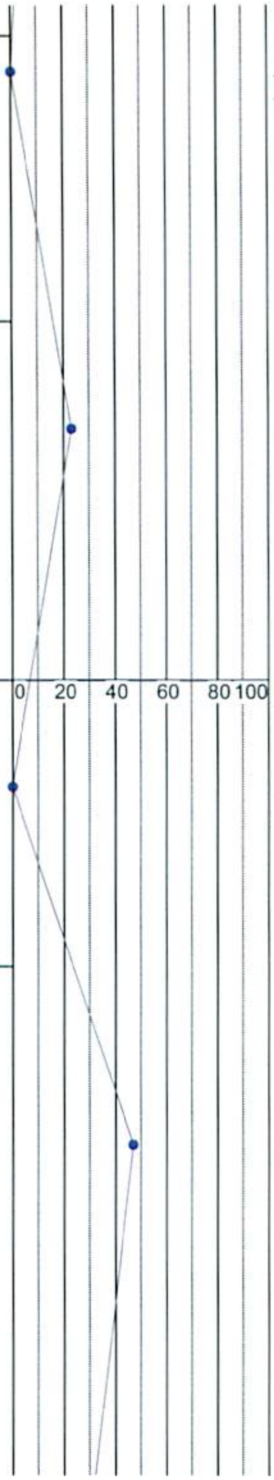

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	CLAYEY SAND (SC): Mottled very-pale-brown (10YR 7/3) and light-greenish-gray (5G 7/1) clayey fine to medium quartz sand Spooned from 21-22 ft.		WOR/WOR/WOH/WOH	WOH		RLOC @ 20 ft. DB from 20 ft. to end of boring Casing set to 20 ft. when at 20 ft. FAS/WOR from 20-21 ft., then FAS/WOH from 21-22 ft.
25	LIMESTONE: Strong White (10YR 8/1) limestone Spooned from 25-27 ft.		7/11/12/16	23		Casing set to 25 ft. when at 25 ft. NoEV @ 25 ft.
30	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and light-yellowish-brown (10YR 6/4) clay Spooned from 30-32 ft.		WOR/WOR/WOR/1	WOR		Casing set to 30 ft. when at 30 ft. FAS/WOR from 30-31.5 ft. Drilled soft from 30-35 ft.
35	LIMESTONE: Very strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 40-45 ft. Spooned from 35-37 ft. and 40-42 ft.		22/22/25/29	47		NoEV from 35 ft. to end of boring Casing set to 35 ft. when at 37 ft.
40						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING	SB-36
CHECKED BY:	JMW	BORING DATE:	11/16/12		
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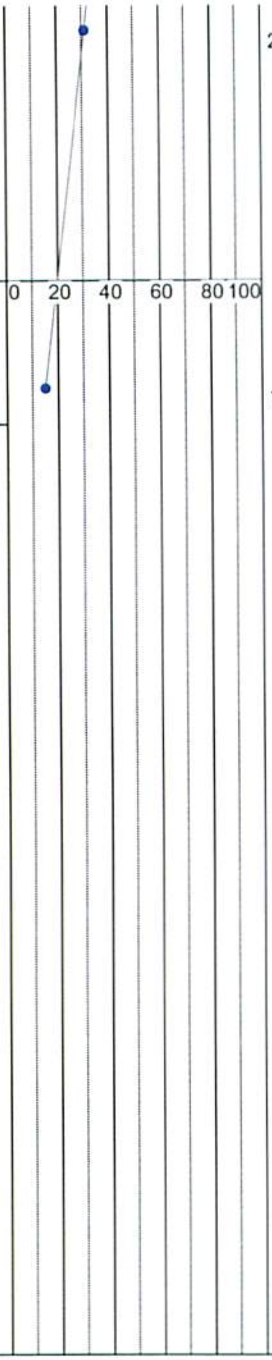
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			21/19/12/7	31		
45	CLAY (CL/CH): Stiff Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel Spooned from 45-47 ft.		7/10/5/5	15		TOB @ 47 ft. bls. Grouted borehole
50						
55						
60						



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/16/12	SB-36
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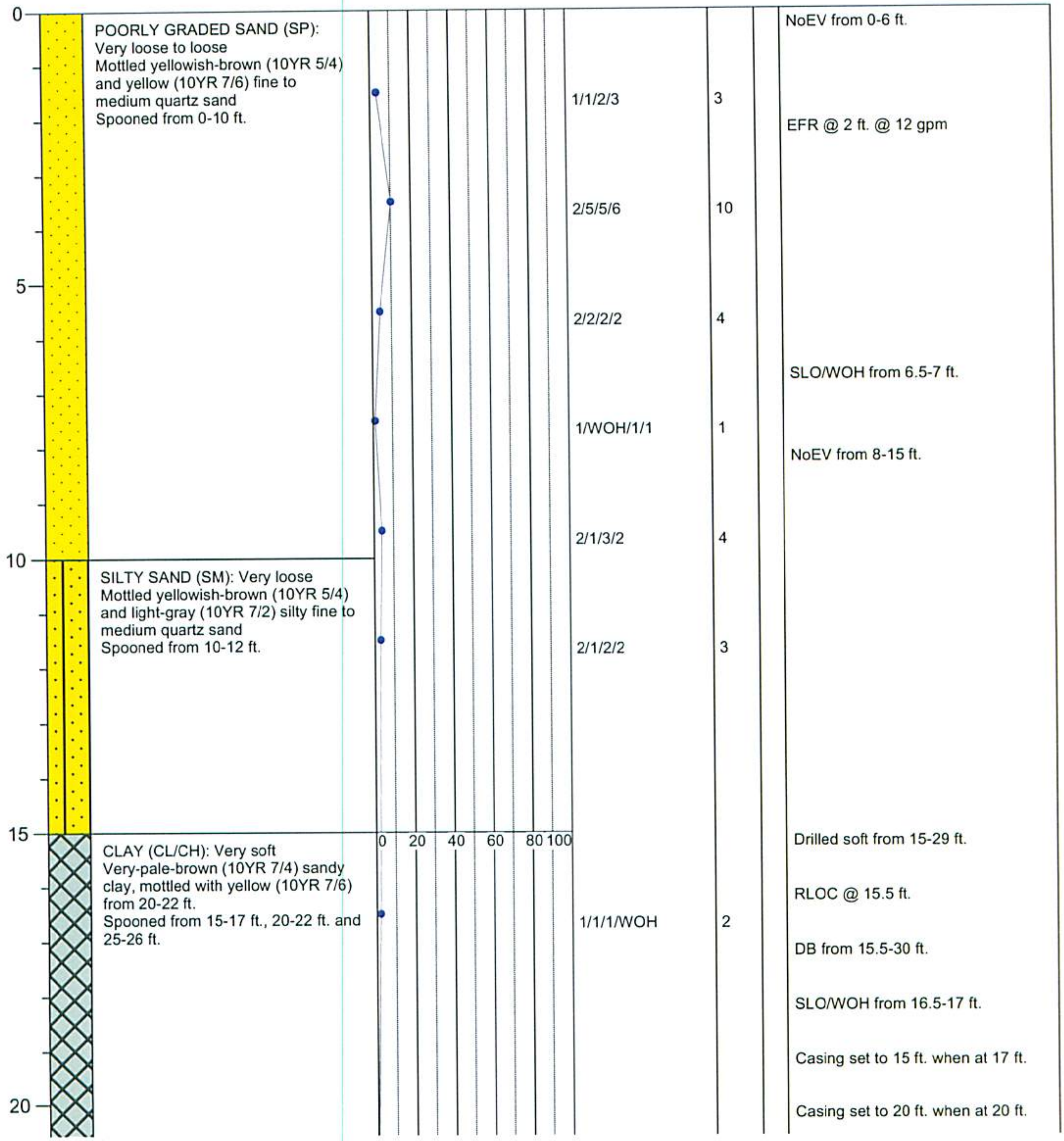

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Very loose to loose Mottled yellowish-brown (10YR 5/4) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 0-10 ft.					NoEV from 0-6 ft.
			1/1/2/3	3		
						EFR @ 2 ft. @ 12 gpm
			2/5/5/6	10		
5			2/2/2/2	4		
						SLO/WOH from 6.5-7 ft.
			1/WOH/1/1	1		
						NoEV from 8-15 ft.
			2/1/3/2	4		
10	SILTY SAND (SM): Very loose Mottled yellowish-brown (10YR 5/4) and light-gray (10YR 7/2) silty fine to medium quartz sand Spooned from 10-12 ft.		2/1/2/2	3		
15	CLAY (CL/CH): Very soft Very-pale-brown (10YR 7/4) sandy clay, mottled with yellow (10YR 7/6) from 20-22 ft. Spooned from 15-17 ft., 20-22 ft. and 25-26 ft.					Drilled soft from 15-29 ft.
						RLOC @ 15.5 ft.
			1/1/1/WOH	2		
						DB from 15.5-30 ft.
						SLO/WOH from 16.5-17 ft.
						Casing set to 15 ft. when at 17 ft.
20						Casing set to 20 ft. when at 20 ft.

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING	
CHECKED BY:	JMW	BORING DATE:	11/15/12	SB-37	
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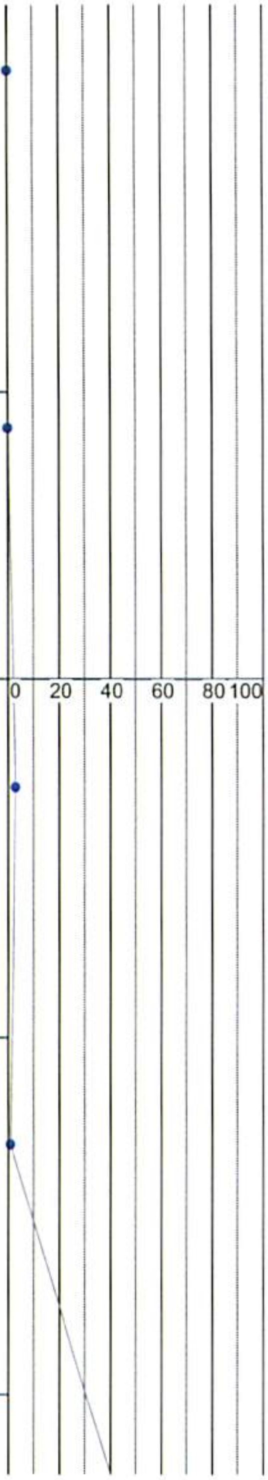
DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
					SLO/WOR from 20-22 ft.
		WOR/WOR/WOR/ WOR	WOR		
25					Casing set to 25 ft. when at 25 ft.
	CLAY (CL/CH): Light-greenish-gray (5G 7/1) clay, mottled with yellow (10YR 7/6) from 26-27 ft. Spooned from 26-27 ft.	WOR/WOR/WOH/5	WOH		SLO/WOR from 25-26 ft., then SLO/WOH from 26-26.5 ft.
30	CLAY (CL/CH): Soft Light-greenish-gray (5G 7/1) clay with limestoneone gravel Spooned from 30-32 ft.				Casing set to 30 ft. when at 30 ft.
					NoEV @ 30 ft.
		3/1/2/3	3		
					EFR @ 30 ft. @ 12 gpm
					Drilled soft from 30-33 ft.
					RLOC @ 34 ft.
35	CLAYEY SAND (SC): Very loose Mottled yellowish-brown (10YR 5/4) and yellow (10YR 7/6) clayey fine to medium quartz sand Spooned from 35-37 ft.				DB from 34-42 ft.
					Drilled soft from 35-43 ft.
		1/1/WOH/2	1		
					FAS/WOH from 36-36.5 ft.
					Casing set to 35 ft. when at 37 ft.
40	LIMESTONE: Moderately strong to very strong White (10YR 8/1) limestone, mottled				NoEV @ 40 ft.



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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 11/15/12
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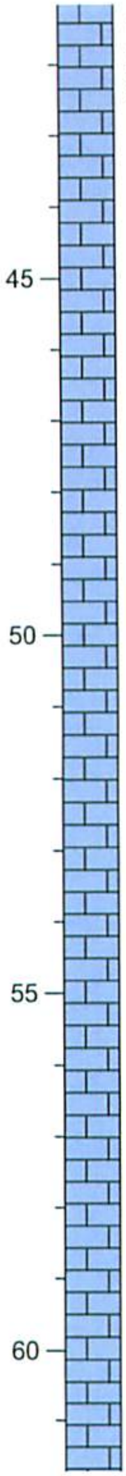
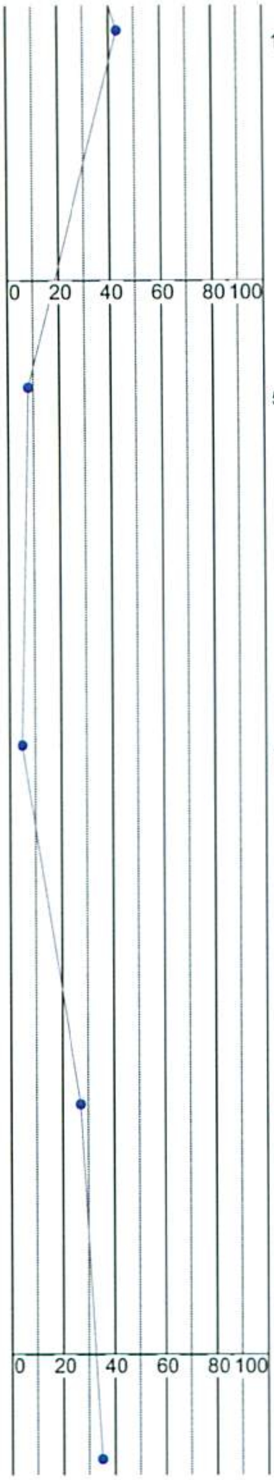
BORING **SB-37**





DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	with yellow (10YR 7/6) from 43-47 ft. and 55-62 ft. Spooned from 40-42 ft., 45-47 ft., 50-52 ft., 55-57 ft. and 60-62 ft.		11/17/26/23	43		Casing set to 40 ft. when at 42 ft.
						SLOC from 42-44 ft.
						DB from 44 ft. to end of boring
45						Drilled soft from 45-52 ft.
			5/6/2/WOH	8		SLO/WOH from 46.5-47 ft.
						Casing set to 45 ft. when at 47 ft.
50						SLO/WOR from 50-51 ft.
			WOR/WOR/5/50+	5		50 blows for 5 inches of penetration @ 51.5 ft.
55						NoEV from 55 ft. to end of boring
			9/14/13/13	27		
60						
			11/18/17/14	35		

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/15/12	SB-37
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DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
						TOB @ 62 ft. bls. Grouted borehole
65						
70						
75		0 20 40 60 80 100				
80						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 11/15/12
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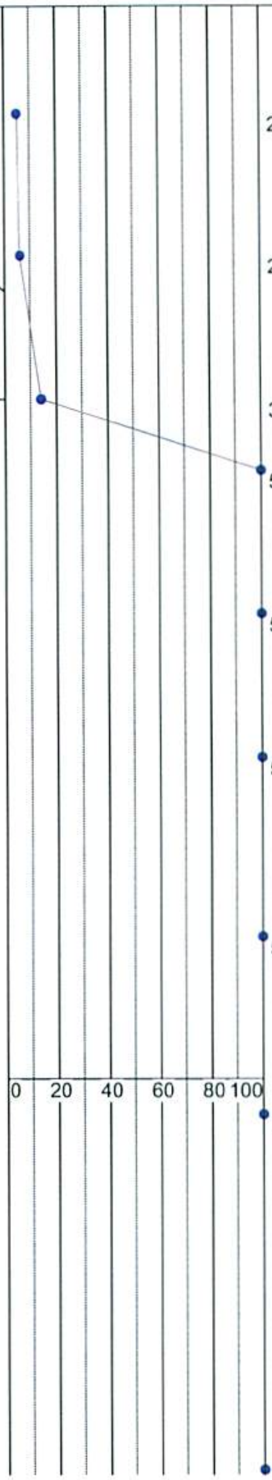
BORING
SB-37

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose Light-yellowish-brown (10YR 6/4) fine to medium quartz sand, mottled with yellow (10YR 7/6) from 3-4 ft. Spooned from 0-4 ft.					NoEV throughout boring
			2/2/3/3	5		EFR @ 2 ft. @ 12 gpm
			2/3/3/2	6		
5	CLAY (CL/CH): Stiff Light-greenish-gray (5G 7/1) sandy clay Spooned from 4-5.5 ft.					
	LIMESTONE: Extremely strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 5.5-6 ft. Spooned from 5.5-6.5 ft., 8-8.5 ft., 10-10.5 ft., 12-13 ft., 15-15.5 ft., 20-20.5 ft. and 25-25.5 ft.		3/3/11/35	14		
			50+	100+		Drilled hard from 6 ft. to end of boring 50 blows for 5 inches of penetration @ 6 ft.
			50+	100+		50 blows for 4 inches of penetration @ 8 ft.
10			50	100		
			50+	100+		50 blows for 5 inches of penetration @ 12.5 ft. RLOC @ 12.5 ft. DB from 12.5 ft. to end of boring
15			50+	100+		Casing set to 15 ft. when at 15 ft. 50 blows for 5 inches of penetration @ 15 ft.
20						50 blows for 3 inches of penetration @ 20 ft.

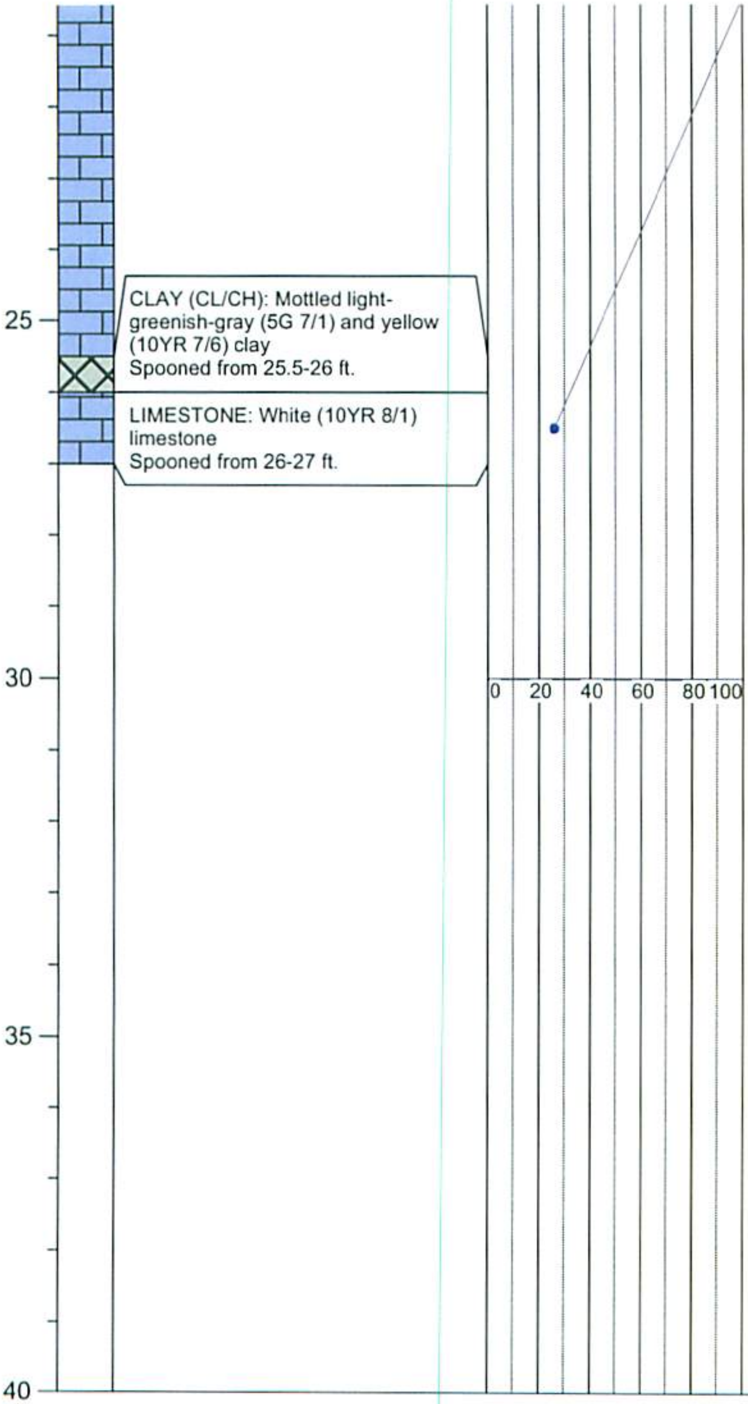
CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/16/12	SB-38
DRAWN BY:	MVK	PAGE NO:	1 of 2	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
25	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 25.5-26 ft.					
	LIMESTONE: White (10YR 8/1) limestone Spooned from 26-27 ft.		6/7/19/22	26		TOB @ 27 ft. bls. Grouted borehole
30						
35						
40						



CDM Smith
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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/16/12	SB-38
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DEPTH (ft) BLS

DESCRIPTION

POORLY GRADED SAND (SP): Very loose to loose
Light-yellowish-brown (10YR 6/4) fine to medium quartz sand, mottled with light-gray (10YR 7/2) and light-brownish-gray (10YR 6/2) from 2-4 ft., and with yellow (10YR 7/6) and grayish-brown (10YR 5/2) from 2-4 ft.
Spooned from 0-6 ft.

CLAY (CL/CH): Very soft
Mottled light-greenish-gray (5G 7/1), gray (10YR 5/1) and yellow (10YR 7/6) clay
Spooned from 6-8 ft.

SILTY SAND (SM): Very loose
Mottled dark-grayish-brown (10YR 4/2), gray (10YR 5/1) and greenish-gray (5G 5/1) silty fine to medium quartz sand
Spooned from 8-10 ft.

CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay
Spooned from 10-11 ft.

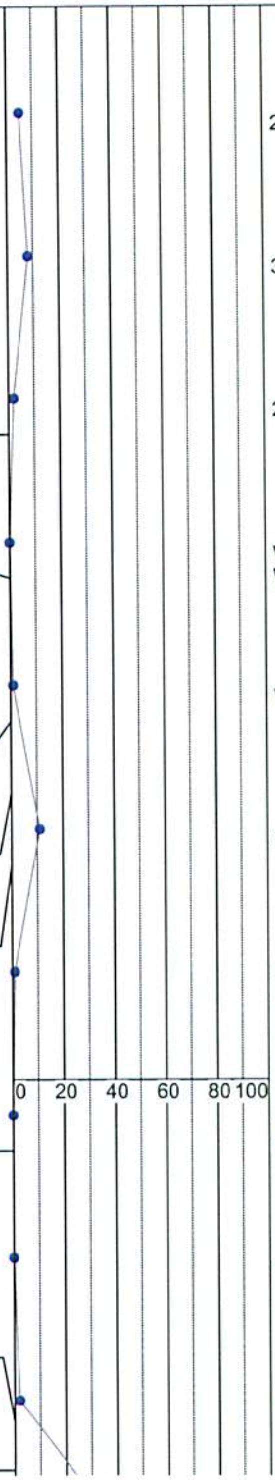
LIMESTONE: White (10YR 8/1) limestone
Spooned from 11-12 ft.

NO RECOVERY

POORLY GRADED SAND WITH CLAY (SP-SC): Very loose
Mottled light-brownish-gray (10YR 6/2) and dark-brown (10YR 3/3) fine to medium quartz sand with clay
Spooned from 16-19.8 ft.

CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay
Spooned from 19.8-20.5 ft.

PENETRATION
blows per foot



BLOW COUNTS	N VALUE
2/2/3/5	5
3/4/4/4	8
2/1/1/1	2
WOH/WOH/WOH/ WOH	WOH
WOR/1/WOH/1	1
2/5/6/4	11
1/1/WOH/WOH	1
WOR/WOR/WOR/ WOH	WOR
WOR/WOR/WOH/1	WOH
1/1/1/2	2

SYMBOL

COMMENTS
Water Table
Drilling Fluid Losses
ft. = ft. bls (typical)

NoEV from 4-6 ft.

EFR @ 2 ft. @ 12 gpm

Drilled soft from 4-10 ft.

FAS/WOH from 6-8 ft.

RLOC @ 8 ft.

DB from 8-10 ft.

FAS/WOR from 8-8.5 ft.

FAS/WOH from 9-9.5 ft.

Casing set to 10 ft. when at 10 ft.

EFR @ 10 ft. @ 12 gpm

NoEV @ 10 ft.

RLOC @ 11 ft.

DB from 11 ft. to end of boring

FAS/WOH from 13-14 ft.

FAS/WOR from 14-15.5 ft., then FAS/WOH from 15.5-16 ft.

FAS/WOR from 16-17 ft., then SLO/WOH from 17-17.5 ft.

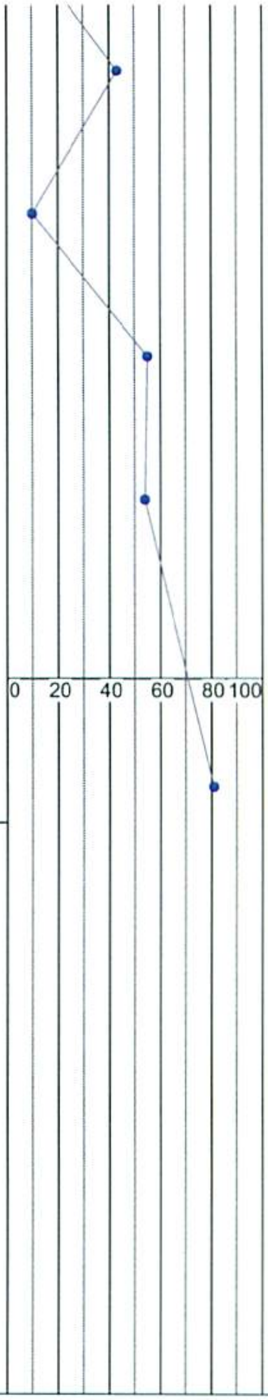
CDM Smith
Tampa, Florida

SDII GLOBAL

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	**PROJECT NO:**	8053622	**BORING**
CHECKED BY:	JMW	**BORING DATE:**	11/16/12	**SB-39**
DRAWN BY:	MVK	**PAGE NO:**	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	LIMESTONE: Moderately strong to extremely strong Very-pale-brown (10YR 8/2) limestone, mottled with yellow (10YR 7/6) from 22-24 ft. Spooned from 20.5-28 ft. and 30-32 ft.				
		9/30/13/18	43		
					NoEV from 18 ft. to end of boring
					Drilled soft from 18-22.5 ft.
		3/9/1/24	10		
25					
		25/7/48/32	55		
		14/26/28/29	54		
					Casing set to 25 ft. when at 28 ft.
					Drilled hard from 29-30 ft.
30					
		34/42/39/50+	81		50 blows for 5 inches of penetration @ 31.5 ft.
					TOB @ 32 ft. bls.
					Grouted borehole
35					
40					

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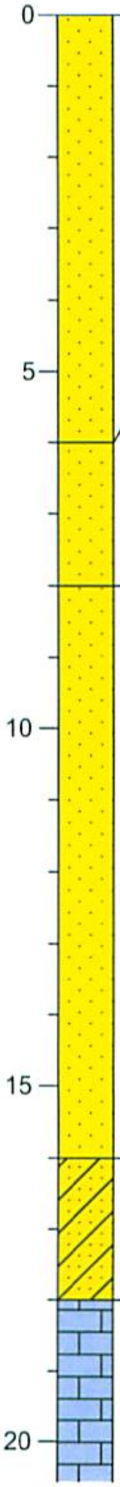
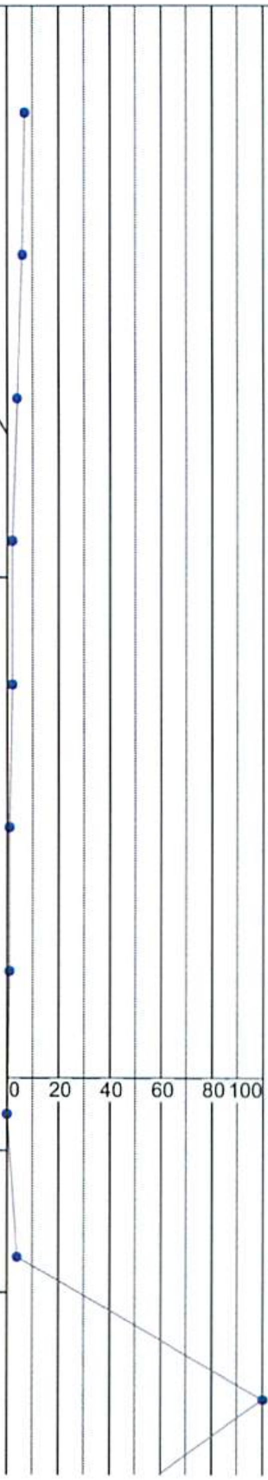
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	**DR**	**PROJECT NO:**	**8053622**	**BORING**
CHECKED BY:	**JMW**	**BORING DATE:**	**11/16/12**	**SB-39**
DRAWN BY:	**MVK**	**PAGE NO:**	**2 of 2**	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	POORLY GRADED SAND (SP): Very loose to loose Light-yellowish-brown (10YR 6/4) fine to medium quartz sand, mottled with yellow (10YR 7/6) from 0-4 ft. Spooned from 0-6 ft.		1/3/4/3	7		NoEV from 0-10 ft. EFR @ 2 ft. @ 12 gpm
			2/3/3/3	6		
			2/2/2/3	4		
	POORLY GRADED SAND (SP): Very loose Mottled light-gray (10YR 7/1) and yellow (10YR 7/6) fine to medium quartz sand Spooned from 6-8 ft.		1/1/1/1	2		
	POORLY GRADED SAND (SP): Very loose Mottled light-yellowish-brown (10YR 6/4), grayish-brown (10YR 5/2) and light-gray (10YR 7/2) fine to medium quartz sand Spooned from 8-16 ft.		1/1/1/1	2		SLO/WOH from 10-11 ft.
			WOH/WOH/1/1	1		SLO/WOH from 12.5-13 ft.
			1/WOH/1/2	1		RLOC @ 13.5 ft. DB from 13.5 ft. to end of boring
			WOR/WOR/WOR/ WOR	WOR		FAS/WOR from 14-16 ft.
	CLAYEY SAND (SC): Very loose Light-yellowish-brown (10YR 6/4) clayey fine to medium quartz sand Spooned from 16-18 ft.		WOR/WOR/4/2	4		SLO/WOR from 16-17 ft.
	LIMESTONE: Strong to extremely strong White (10YR 8/1) limestone, mottled with light-gray (10YR 7/1) and yellow (10YR 7/6) from 18-18.5 ft. Spooned from 18-19.5 ft. and 20-22 ft.		2/7/50+	100+		NoEV from 18-35 ft. Casing set to 15 ft. when at 18 ft. 50 blows for 5 inches of penetration @ 19 ft.

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
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PROJECT NO: 8053622
BORING DATE: 11/19/12
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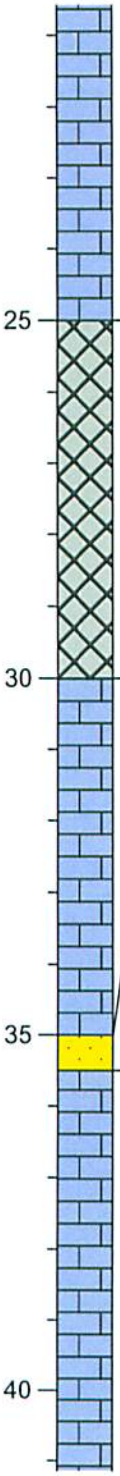
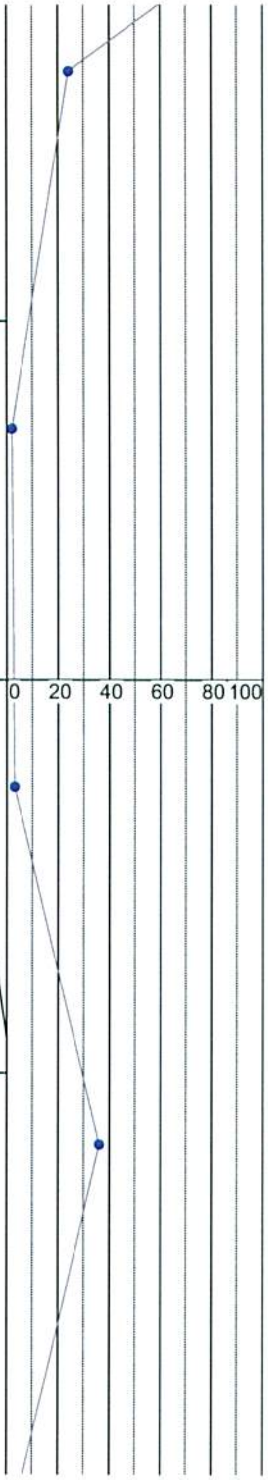
BORING
SB-40





DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			22/9/15/50+	24		Drilled hard from 19-20 ft. Casing set to 20 ft. when at 20 ft. 50 blows for 4 inches of penetration @ 21.5 ft. Drilled hard from 22-23 ft.
25	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel Spooned from 25-27 ft.		1/1/1/1	2		Casing set to 25 ft. when at 27 ft.
30	LIMESTONE: Weak White (10YR 8/1) limestone Spooned from 30-32 ft.		3/2/1/2	3		Casing set to 30 ft. when at 30 ft.
35	POORLY GRADED SAND (SP): Light-gray (10YR 7/2) fine to medium quartz sand Spooned from 35-35.5 ft.					SLO/WOR from 35-35.5 ft.
	LIMESTONE: Weak to moderately strong White (10YR 8/1) limestone Spooned from 35.5-37 ft., 40-42 ft. and 45-47 ft.		WOR/24/12/8	36		Casing set to 35 ft. when at 37 ft.
40						NoEV from 40 ft. to end of boring

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/19/12	SB-40
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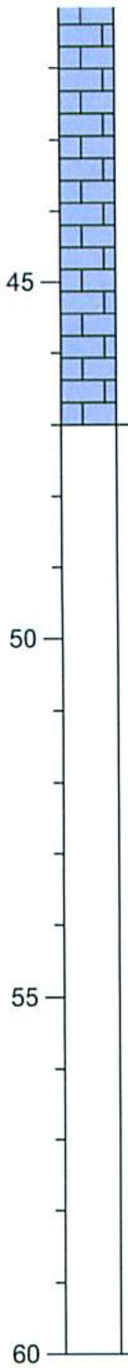
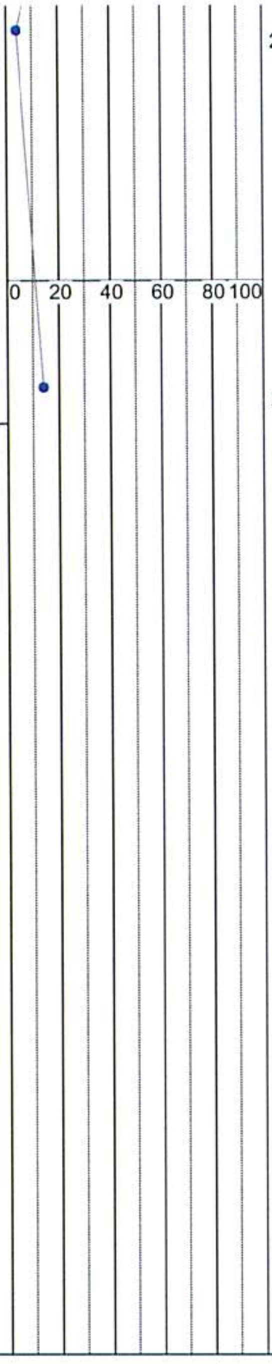
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			2/1/3/6	4		
45						Casing set to 45 ft. when at 45 ft.
			28/12/2/1	14		TOB @ 47 ft. bls.
						Grouted borehole
50						
55						
60						





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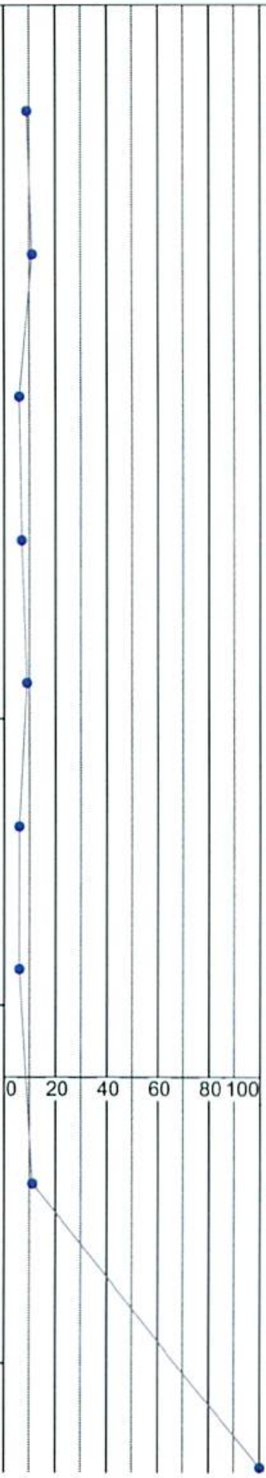
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	**DR**	**PROJECT NO:**	**8053622**	**BORING**
CHECKED BY:	**JMW**	**BORING DATE:**	**11/19/12**	**SB-40**
DRAWN BY:	**MVK**	**PAGE NO:**	**3 of 3**	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Light-yellowish-brown (10YR 6/4) fine to medium quartz sand, mottled with light-brownish-gray (10YR 6/2) from 1-6 ft. and light-gray (10YR 7/1) from 8-10 ft. Spooned from 0-10 ft.					NoEV throughout boring
			2/4/5/7	9		EFR @ 2 ft. @ 12 gpm
			5/5/6/5	11		
5			2/3/3/3	6		
			3/3/4/5	7		
			4/4/5/4	9		
10	CLAY (CL/CH): Medium stiff Mottled light-brownish-gray (10YR 6/2) and yellow (10YR 7/6) sandy clay Spooned from 10-14 ft.		2/3/3/4	6		
			1/3/3/5	6		
15	CLAY (CL/CH): Light-brownish-gray (10YR 6/2) clay with limestone gravel Spooned from 15-17 ft.		3/5/6/6	11		Casing set to 15 ft. when at 17 ft.
20	LIMESTONE: Very strong to extremely strong White (10YR 8/1) limestone Spooned from 20-20.5 ft., @ 25 ft.					50 blows for 4 inches of penetration @ 20 ft.

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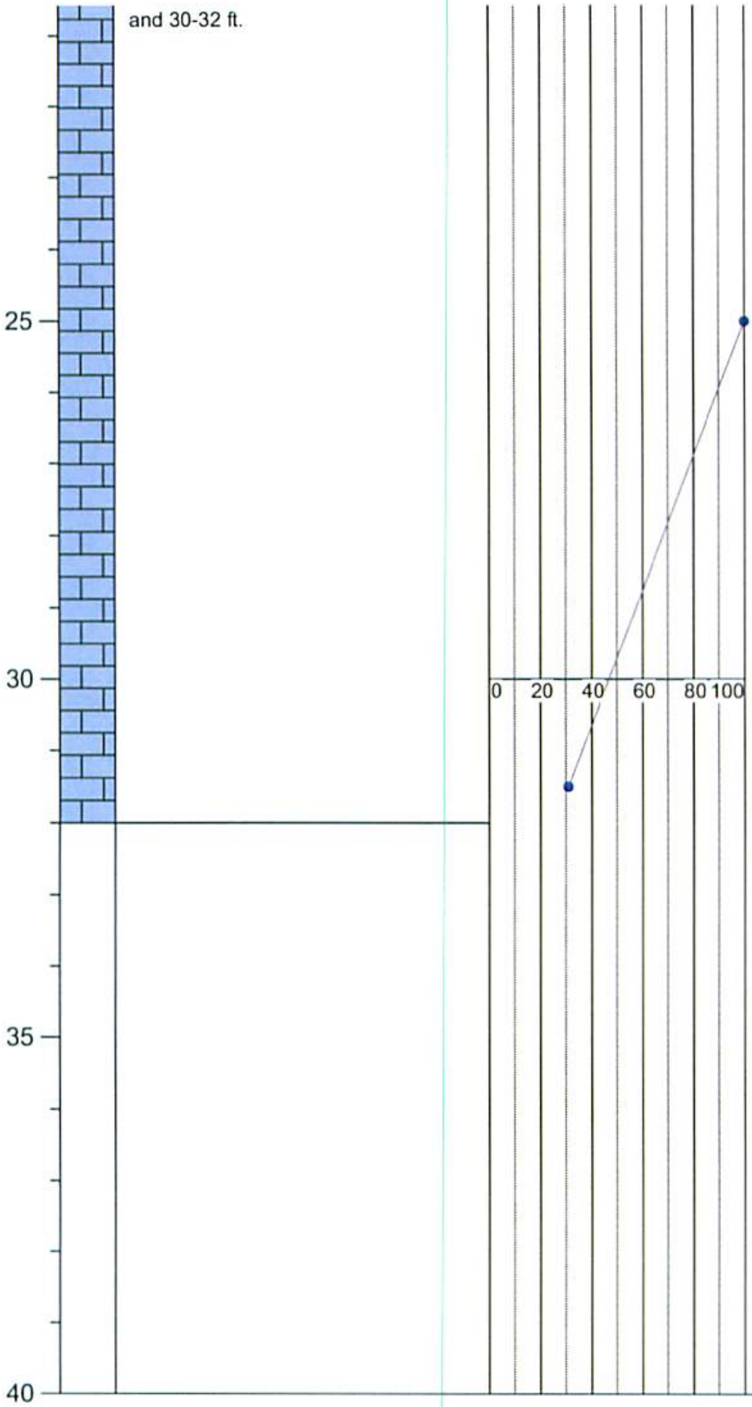
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/19/12	SB-41
DRAWN BY:	MVK	PAGE NO:	1 of 2	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)



BLOW COUNTS	N VALUE	COMMENTS
		RLOC @ 22.5 ft.
		DB from 22.5 ft. to end of boring
50+	100+	Drilled hard from 24 ft. to end of boring
		50 blows for 1 inch of penetration @ 25 ft.
4/6/25/34	31	TOB @ 32 ft. bls.
		Grouted borehole

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Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY: DR
CHECKED BY: JMW
DRAWN BY: MVK

PROJECT NO: 8053622
BORING DATE: 11/19/12
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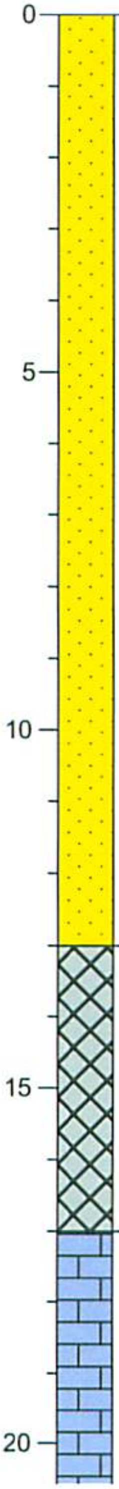
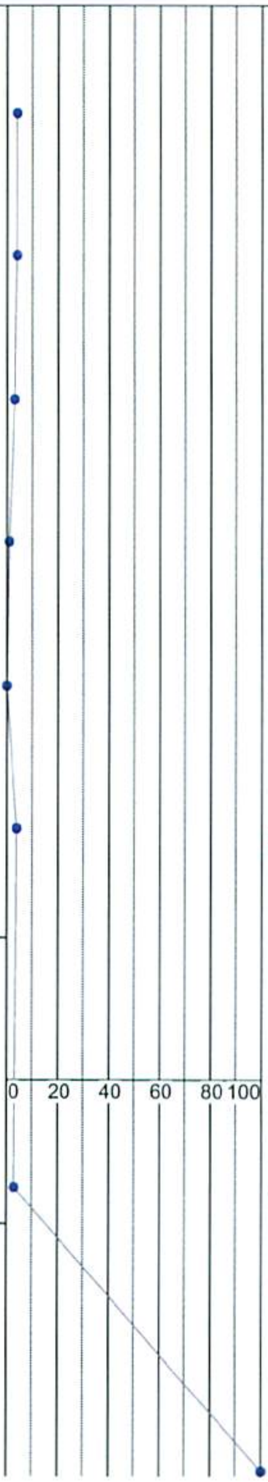
BORING **SB-41**





DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Very loose Light-gray (10YR 7/1) fine to medium quartz sand, mottled with Yellow (10YR 7/6) from 0-6 ft. and 8-10 ft. and with Grayish-brown (10YR 5/2) from 10-12 ft. Spooned from 0-12 ft.					NoEV from 0-6 ft.
			1/2/2/1	4		
						EFR @ 2 ft. @ 12 gpm
			2/2/2/2	4		
5						
			1/2/1/1	3		
						SLO/WOH from 6.5-7 ft.
			2/WOH/1/1	1		
						SLO/WOH from 8.5-9.5 ft.
			1/WOH/WOH/1	WOH		
10						Casing set to 10 ft. when at 10 ft.
						NoEV @ 10 ft.
			2/2/2/2	4		
	CLAY (CL/CH): Soft Mottled light-greenish-gray (5G 7/1) and light-yellowish-brown (10YR 6/4) clay with limestone gravel Spooned from 15-17 ft.					
15						Casing set to 15 ft. when at 15 ft.
						SLO/WOH from 15.5-16 ft.
			WOH/1/2/2	3		
	LIMESTONE: Moderately strong to extremely strong White (10YR 8/1) limestone Spooned from 20-20.5 ft., 25-27 ft., 30-32 ft. and 35-37 ft.					
						RLOC @ 18 ft.
						DB from 18 ft. to end of boring
20						NoEV from 20 ft. to end of boring

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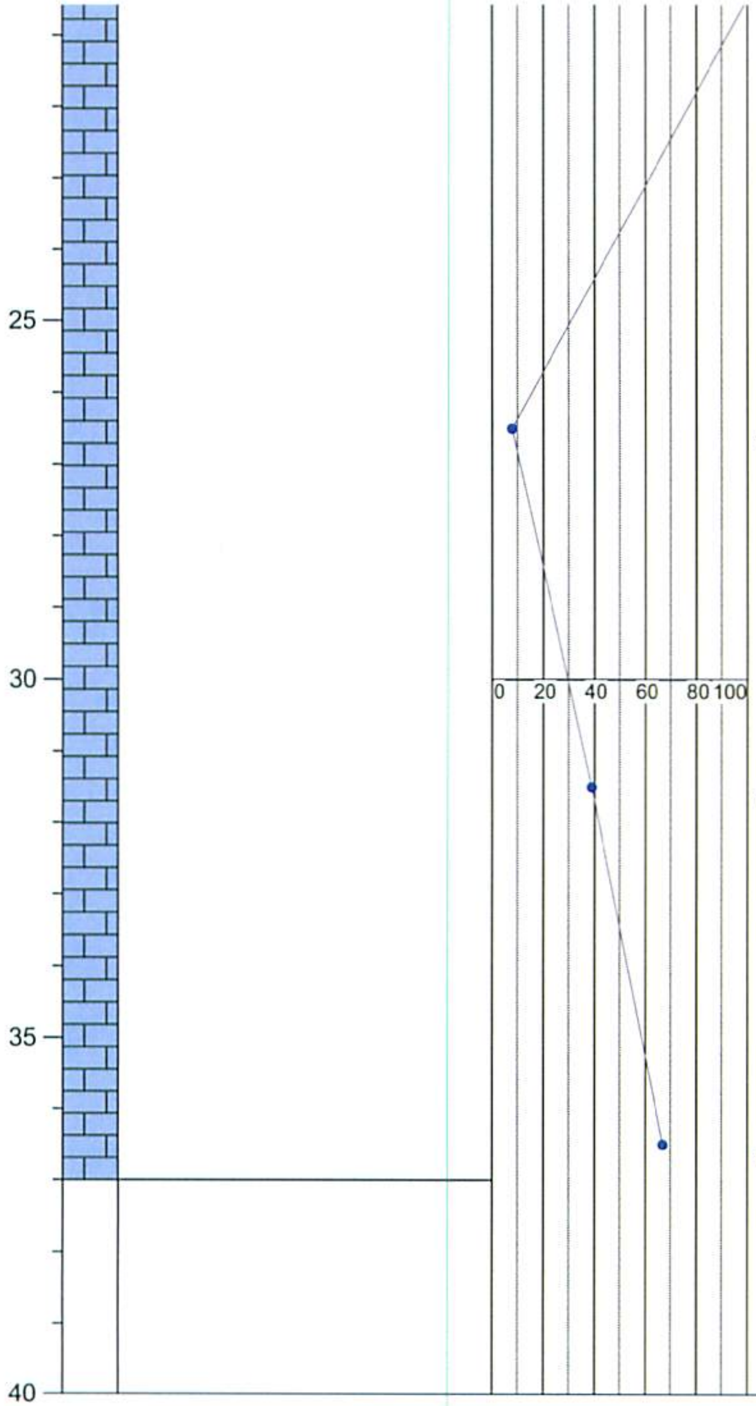
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/27/12	SB-42
DRAWN BY:	MVK	PAGE NO:	1 of 2	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
						Casing set to 20 ft. when at 20.5 ft.
						Drilled hard from 20-25 ft.
			10/4/4/9	8		
			15/22/17/14	39		
			17/26/41/26	67		
						TOB @ 37 ft. bls.
						Grouted borehole

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/27/12	SB-42
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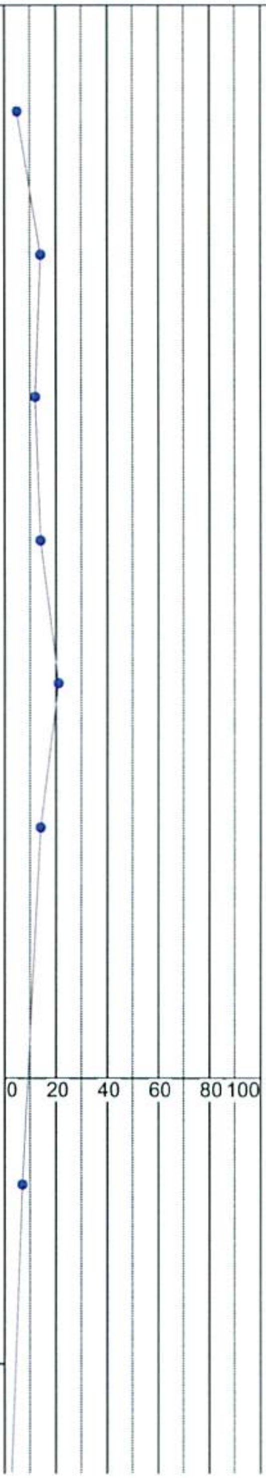

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Mottled light-gray (10YR 7/2) and light-brownish-gray (10YR 6/2) fine to medium quartz sand Spooned from 0-12 ft. and 15-17 ft.					NoEV from 0-20 ft.
			1/1/4/6	5		
						EFR @ 2 ft. @ 12 gpm
			5/7/7/9	14		
5						
			4/5/7/9	12		
			5/6/8/8	14		
			6/9/12/12	21		
10						
			3/9/5/5	14		
15						
			3/3/4/5	7		
	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay Spooned from 20-21.5 ft.					
20						Casing set to 20 ft. when at 20 ft.

CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/27/12	SB-43
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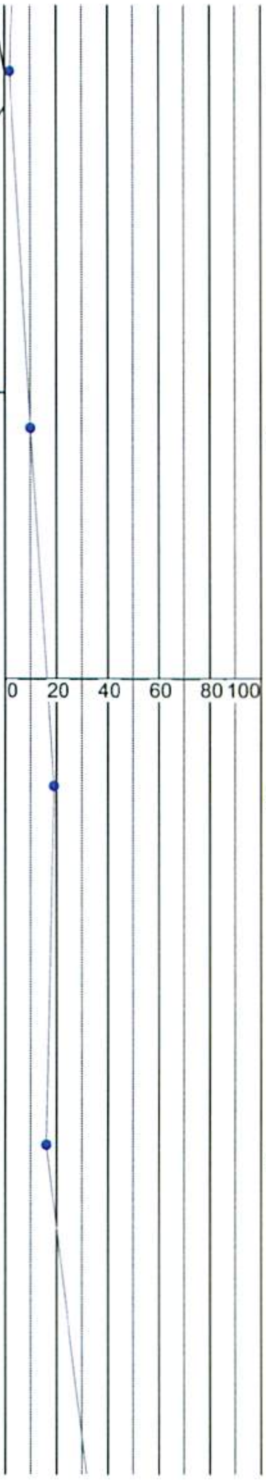

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
	LIMESTONE: Mottled very-pale-brown (10YR 8/2) and yellow (10YR 7/6) limestone Spooned from 21.5-22 ft.		WOH/1/1/2	2		SLO/WOH from 20-20.5 ft.
	CLAY (CL/CH): Stiff Very-pale-brown (10YR 8/2) clay with limestone gravel Spooned from 25-26 ft.					
25						Casing set to 25 ft. when at 25 ft.
	LIMESTONE: Strong to very strong White (10YR 8/1) limestone Spooned from 26-27 ft., 30-32 ft., 35-37 ft. and 40-42 ft.		WOH/3/7/9	10		SLO/WOH from 25-25.5 ft. RLOC @ 26 ft. DB from 26-32 ft.
30						NoEV from 30 ft. to end of boring
			5/6/13/24	19		Casing set to 30 ft. when at 32 ft. EFR @ 32 ft. @ 12 gpm RLOC @ 33 ft.
35						DB from 33 ft. to end of boring
			5/7/9/12	16		
40						

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SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/27/12	SB-43
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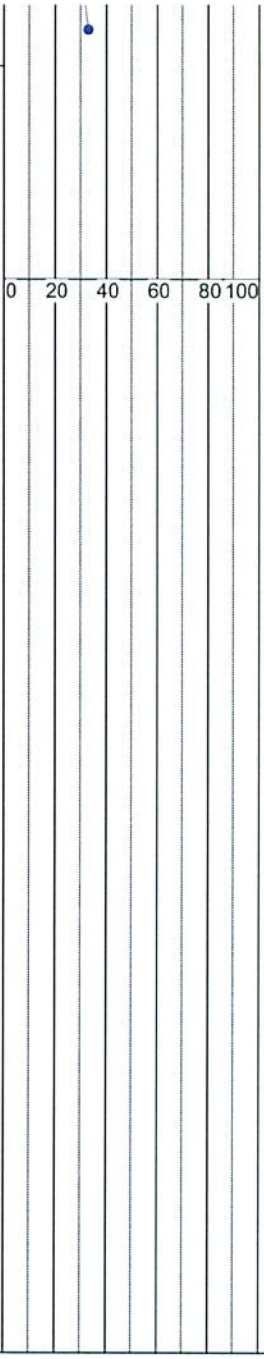
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
▨			12/11/22/13	33		TOB @ 42 ft. bls. Grouted borehole
45						
50						
55						
60						



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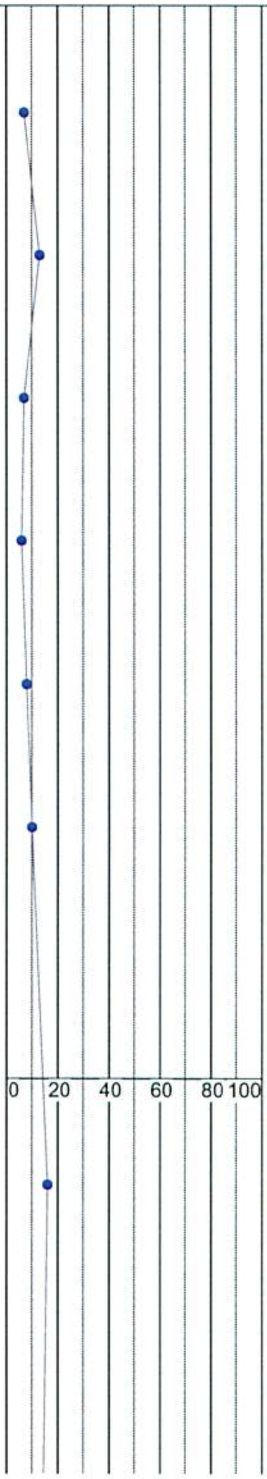
SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/27/12	SB-43
DRAWN BY:	MVK	PAGE NO:	3 of 3	



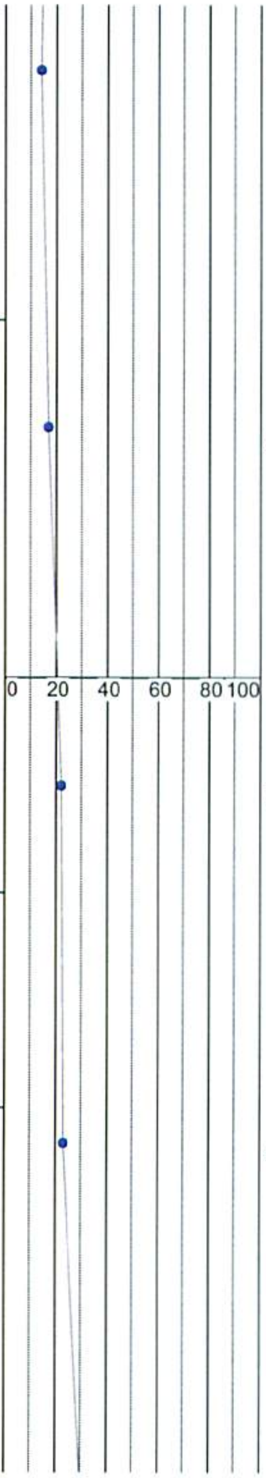
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Very-pale-brown (10YR 7/3) fine to medium quartz sand, mottled with light-yellowish-brown (10YR 6/4) from 0-6 ft. and 10-12 ft. Spooned from 0-12 ft., 15-17 ft. and 20-22 ft.					NoEV throughout boring
			1/2/5/6	7		EFR @ 2 ft. @ 12 gpm
			4/6/7/6	13		
5						
			2/3/4/4	7		
			3/3/3/4	6		
			3/4/4/5	8		
10						
			2/5/5/7	10		
15						
			4/7/9/10	16		
20						

CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/28/12	SB-44
DRAWN BY:	MVK	PAGE NO:	1 of 3	



DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			4/6/8/10	14		
25	POORLY GRADED SAND (SP): Loose to medium dense White (10YR 8/1) fine to medium quartz sand Spooned from 25-27 and 30-32 ft.		5/7/10/12	17		Casing set to 25 ft. when at 27 ft.
30			7/11/11/12	22		Casing set to 30 ft. when at 32 ft.
	CLAY (CL/CH): Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) clay with limestone gravel Spooned from 35-36 ft.					
35						
	LIMESTONE: Strong White (10YR 8/1) limestone, mottled with yellow (10YR 7/6) from 36-37 ft. Spooned from 36-37 ft., 40-42 ft., 45-47 ft. and 50-52 ft.		4/9/14/14	23		Casing set to 35 ft. when at 37 ft.
40						

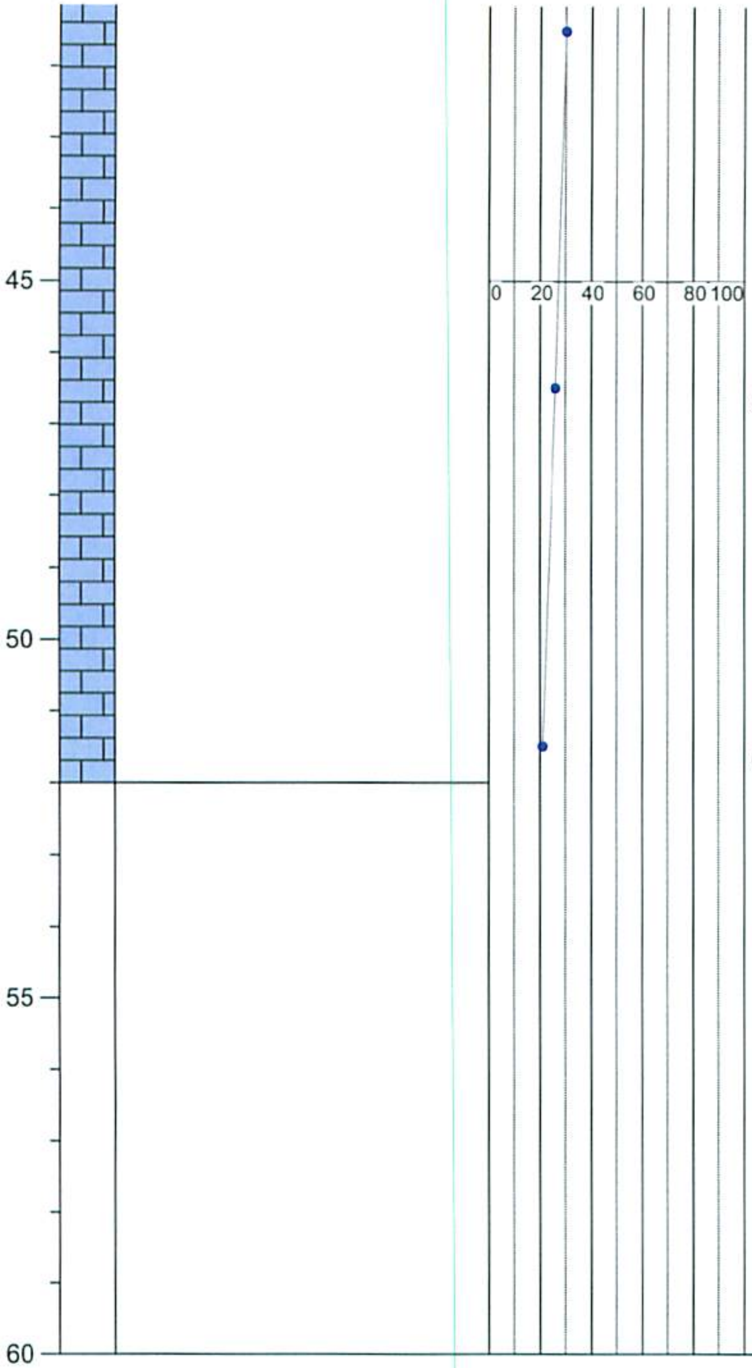
CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/28/12	SB-44
DRAWN BY:	MVK	PAGE NO:	2 of 3	

DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			11/17/13/6	30		
						Drilled hard from 43-45 ft.
			34/15/11/12	26		
			8/9/12/8	21		
						TOB @ 52 ft. bls.
						Grouted borehole



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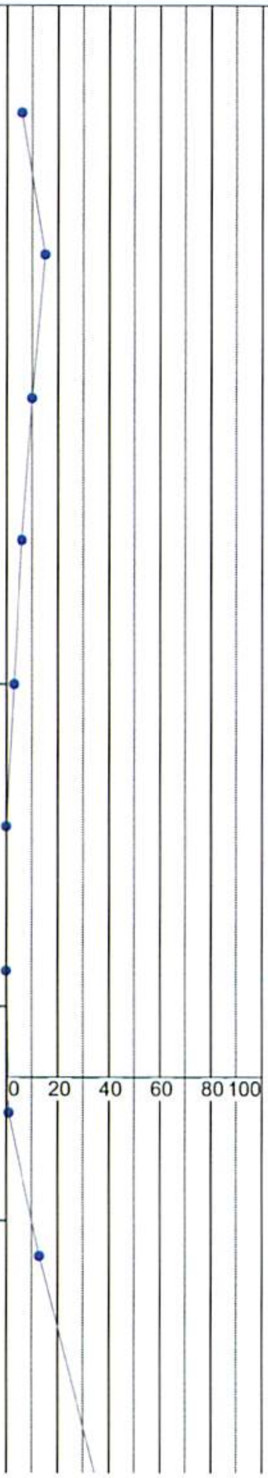
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/28/12	SB-44
DRAWN BY:	MVK	PAGE NO:	3 of 3	



DEPTH (ft) BLS	DESCRIPTION	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
0	POORLY GRADED SAND (SP): Loose to medium dense Light-gray (10YR 7/2) fine to medium quartz sand, mottled with light-brownish-gray (10YR 6/2) and yellow (10YR 7/6) from 0-6 ft. and with light-gray (10YR 7/1) from 6-9.5 ft. Spooned from 0-9.5 ft.				NoEV from 0-10 ft.
		1/2/4/6	6		EFR @ 2 ft. @ 12 gpm
		5/7/8/8	15		
5					
		3/4/6/4	10		
		3/3/3/4	6		
	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1) and yellow (10YR 7/6) sandy clay Spooned from 9.5-14 ft.	3/1/2/1	3		SLO/WOH from 10-11.5 ft., then FAS/WOH from 11.5-12 ft.
10					
		WOH/WOH/WOH/ WOH	WOH		SLO/WOR from 12-12.5 ft., then SLO/WOH from 12.5-14 ft.
	CLAY (CL/CH): Very soft Mottled light-greenish-gray (5G 7/1), yellow (10YR 7/6) and white (10YR 8/1) clay with limestone gravel Spooned from 14-17 ft.	WOR/WOH/WOH/ WOH	WOH		SLO/WOR from 14-14.5 ft., then SLO/WOH from 14.5-15 ft.
15					
		WOR/WOH/1/2	1		NoEV from 16 ft. to end of boring
	LIMESTONE: Very strong White (10YR 8/1) limestone Spooned from 17-18 ft., 20-22 ft., 25-27 ft. and 30-32 ft.	1/4/9/12	13		Casing set to 20 ft. when at 18 ft.
20					

CDM Smith
Tampa, Florida

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

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CHECKED BY:	JMW	BORING DATE:	11/28/12	SB-45
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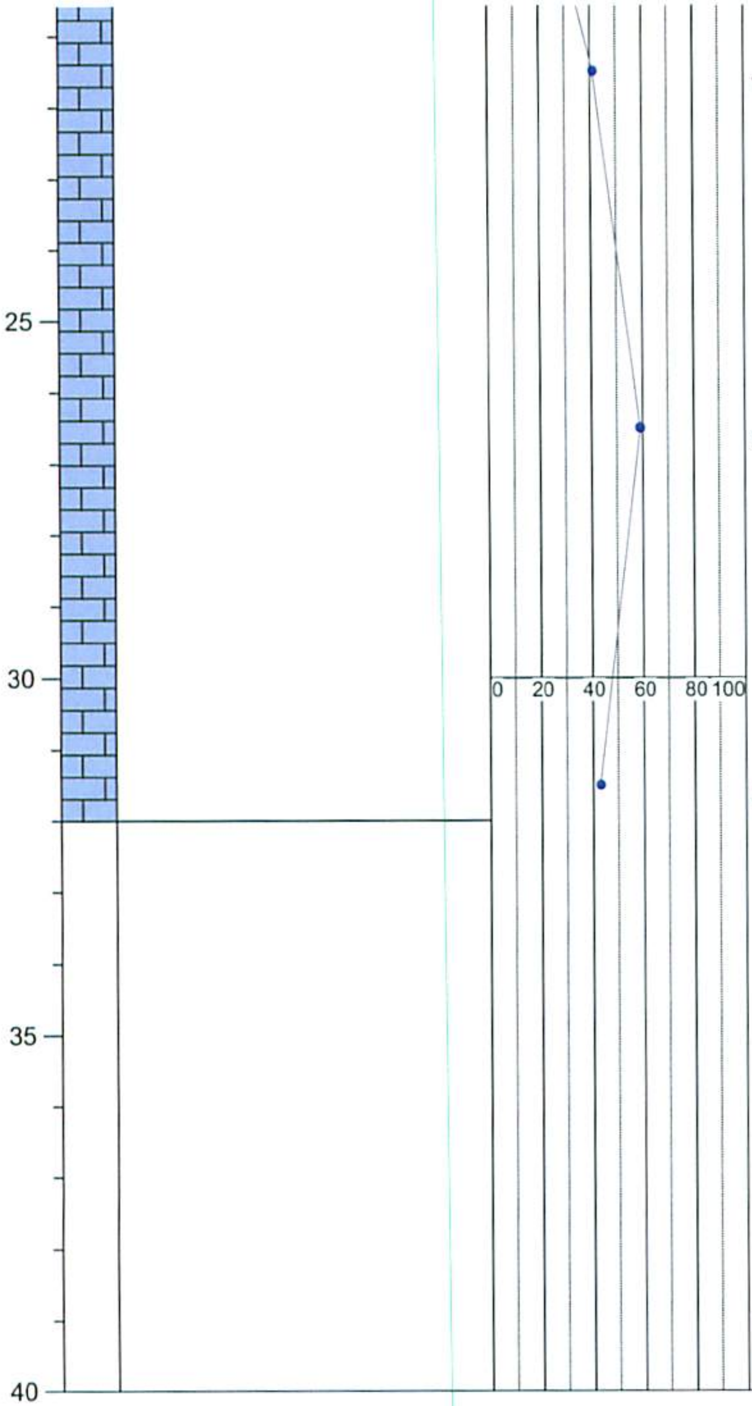
DEPTH (ft) BLS	DESCRIPTION	PENETRATION blows per foot	BLOW COUNTS	N VALUE	SYMBOL	COMMENTS Water Table Drilling Fluid Losses ft. = ft. bls (typical)
			18/16/25/29	41		
						Drilled hard from 24 ft. to end of boring
			8/23/36/27	59		
			25/25/18/14	43		
						TOB @ 32 ft. bls.
						Grouted borehole



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Tampa, Florida

SDII GLOBAL

SPT BORING LOG

SITE NAME: PCRRF - South Stormwater Pond
SITE LOCATION: Spring Hill, Florida

DESIGNED BY:	DR	PROJECT NO:	8053622	BORING
CHECKED BY:	JMW	BORING DATE:	11/28/12	SB-45
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