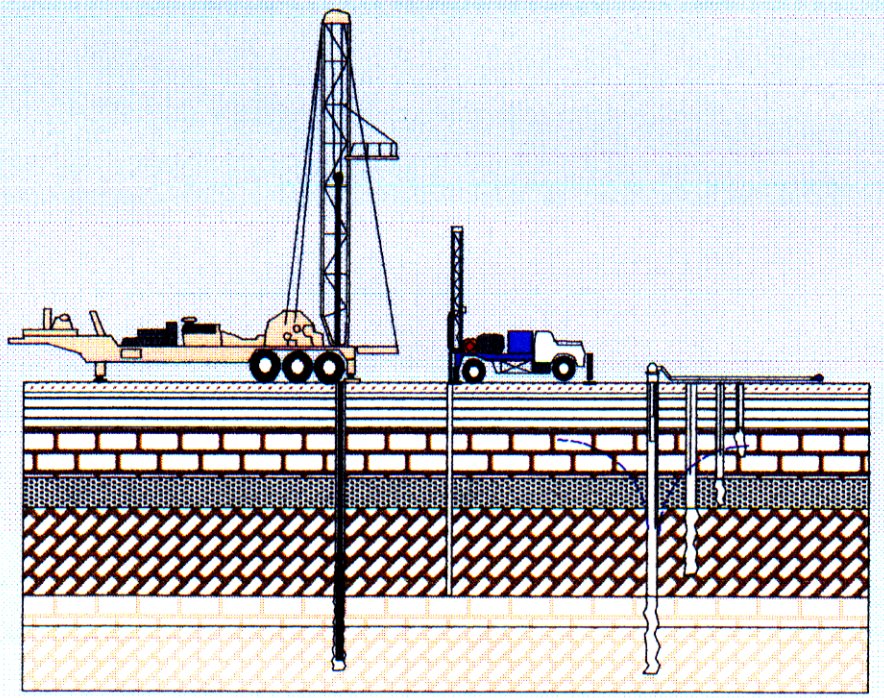
ROMP 5 CECIL WEBB
MONITOR WELL SITE
CHARLOTTE COUNTY, FLORIDA

VOLUME ONE

CORE DRILLING AND TESTING



Geohydrologic Data Section
Resource Data Department
Southwest Florida Water Management District
June 1997

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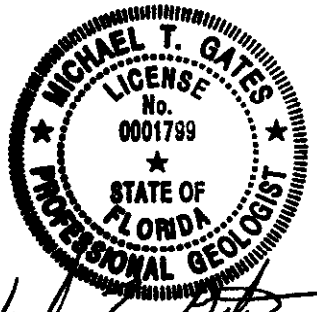
The geological evaluations and interpretations contained in the *ROMP 5 Core Drilling and Testing Report* have been prepared by or approved by a Certified Professional Geologist in the State of Florida, in accordance with Chapter 492, Florida Statutes.



Michael T. Gates
Professional Geologist
License No. PG 0001799

Date: 6/19/97

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MONITOR WELL SITE
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VOLUME ONE

CORE DRILLING AND TESTING

By M. T. Gates

Southwest Florida Water Management District

Resource Data Department
Timothy De Foe, Director

Geohydrologic Data Section
S. Greg McQuown, Manager

Southwest Florida Water Management District
2379 Broad Street
Brooksville, Florida 34609-6899

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1.0 INTRODUCTION

The ROMP 5 (WRAP S-2) Cecil Webb well site is one of six Regional Observation and Monitor-Well Program (ROMP) well sites constructed for the Southern District Water Resource Assessment Project (SDWRAP). The SDWRAP is a long-term study of the ground-water systems in DeSoto County, Hardee County, and portions of Charlotte, Polk, and Sarasota Counties (Figure 1).

The ROMP 5 Well Site was obtained by the Southwest Florida Water Management District (SWFWMD) in December 1992 for construction of a multiple well monitor site. Drilling, testing, and monitor well construction at ROMP 5 was planned in several phases. The data collected during these phases is presented as a four volume report: Volume One - **Core Drilling and Testing**, Volume Two - **Exploratory Drilling and Testing**, Volume Three - **Monitor Well Construction**, and Volume Four - **Aquifer Performance Testing**.

The first phase, exploratory coring from land surface to 1,304 feet (ft) below land surface (bls), began June 1993 and was completed in December 1993. The next phase of work, deep exploratory drilling (below 1,304 ft bls) and testing and monitor well construction was initiated in February 1995. The exploratory drilling and testing was completed in June 1996 and monitor well construction was completed in September 1996. The last phase of work at ROMP 5, aquifer performance testing, began in January 1997 and was completed in April 1997. This report, **Volume One - Core Drilling and Testing**, presents the data collected from the core drilling and testing at ROMP 5.

2.0 SITE LOCATION

The ROMP 5 (WRAP S-2) Cecil Webb well site is located in Charlotte County, east of Punta Gorda (Figure 2). ROMP 5 is located within the Cecil M. Webb Wildlife Management Area in the northwest quarter of the northwest quarter of Section 3, Township 41 South, Range 25 East at latitude 26° 56' 44", longitude 81° 48' 29" (Figure 3). Land surface elevation at the well site is approximately 40 ft above the National Geodetic Vertical Datum of 1929 (NGVD).

3.0 DATA COLLECTION METHODS

Hollow-stem auger, wire-line coring, and mud rotary drilling methods were used to collect lithologic and aqueous samples with depth. The hollow-stem auger method was used initially in the unconsolidated sediments. The wire-line coring method was employed after encountering competent limestone. The mud-rotary method was used to install casing at various locations in order to advance the core-hole. A stainless steel bailer was used to collect the ground-water samples while drilling. All ground-water samples were collected in accordance with ROMP Water Quality Sampling Protocol.

3.1 LITHOLOGIC SAMPLING

Drilling at ROMP 5 during the coring phase of work (June 1993 to December 1993) was performed with the District-owned Central Mine Exploration (CME) 75 core drilling rig. Continuous core was collected from land surface to 1,304 ft bls from June 1993 to December 1993. Figure 4 presents a diagram of the core drilling apparatus.

Hollow-stem augers and a split spoon sampler were used to collect continuous lithologic samples from land surface to 35 ft bls. Limestone was encountered at 35 ft bls terminating the auger hole. The auger hole was abandoned and plugged from 35 ft bls to land surface.

A new 10-inch diameter borehole was drilled to 36 ft bls using the mud-rotary method. Six-inch diameter polyvinyl-chloride (PVC) was installed to 36 ft bls and grouted in place. Four inch diameter HW steel casing was installed to the bottom of the six inch PVC casing at 36 ft bls. Wire-line coring began at 36 ft bls inside the four inch steel HW casing. Three inch outside diameter (OD) NQ core rods were used to collect the approximate two inch diameter core. The core was collected continuously and retrieved at five foot intervals. Coring continued to 149 ft bls, then the four inch HW casing was removed and a six inch borehole was advanced from 36 ft bls to 149 ft bls. The HW casing was installed to 149 ft bls and wire-line coring resumed. Wire-line coring continued in this borehole to a depth of 509 ft bls. Coring was stopped at 509 ft bls and the borehole was converted to a two inch diameter intermediate aquifer upper permeable zone temporary observation well (Figure 5).

A new 10-inch diameter borehole was drilled to 420 ft bls and six inch PVC was installed and grouted into place. The four inch diameter HW steel casing was installed inside the PVC to 420 ft bls and wire-line coring resumed. At 490 ft bls the HW steel casing was removed, a six inch borehole was advanced from 420 ft bls to 490 ft bls and the HW steel casing reinstalled to 490 ft bls. Wire-line coring continued to 711 ft bls. The Suwannee Limestone was encountered at 711 ft bls. The HW casing was removed, the bore-hole advanced and the HW casing reinstalled to 709 ft bls in order to collect accurate Upper Floridan head levels and water samples. Wire-line coring continued from 711 ft bls to 1304 ft bls into the Avon Park Formation. The core-hole was terminated at 1304 ft bls. The core-hole was then converted to a two inch diameter Suwannee Limestone/Upper Floridan aquifer temporary well (Figure 6).

3.2 GROUND-WATER SAMPLING

Split ground-water samples were collected at 20 ft or 40 ft intervals from land surface to 1,304 ft bls while advancing the core-hole. One sample was analyzed in the field for temperature, specific conductance, pH, chloride, sulfate, and density. The other sample was delivered to the District Environmental Chemistry Laboratory for more extensive analyses. Chain-of-Custody forms were used to track the samples. Results of the ground-water samples analyses are presented in Section 6.0.

Ground-water samples were collected using a 10 ft, 1.66-inch diameter, stainless steel bailer equipped with top and bottom check balls (Figure 7). Following airlifting (displacing water in the borehole by discharging air into the core rods) the core bit is lowered to near bottom. The bailer is then lowered through the core rods, on a wire-line to the bottom of the drill string and retrieved. The bailer samples are generally representative of water quality at depth, due to a moderate level of control provided by the check ball system of the bailer, however these samples can be affected by water contribution from up-hole permeable beds. Table 1 present the results of the ground-water samples collected and analyzed in the field. Table 2 presents the results of ground-water samples analyzed by the District laboratory.

3.3 GEOPHYSICAL LOGGING

Borehole geophysical logs were collected at ROMP 5 during various stages of core drilling and well construction to the total cored depth of 1,304 feet bls. Geophysical logs are used to delineate hydrogeologic units, characterize water quality, and to calculate amounts of well construction materials.

Table 3 presents a summary of the geophysical logs run during core drilling at ROMP 5. Figures 8, 9, and 10 present geophysical logs run at various stages of core drilling. All logs were run with SWFWMD's digital geophysical logging equipment and are archived with the ROMP 5 File of Record. The geophysical logs run during core drilling are identified below:

CALIPER	Three-arm caliper
GAM(NAT)	Natural Gamma
SP	Spontaneous Potential
RES	Single point resistance
RES(16N)	16" Normal resistivity
RES(64)	64" Normal resistivity
RES SUITE	Single point resistance (16", 64" Normal, laterlog)
RES(FL)	Fluid Resistivity
SP COND	Specific Conductance-fluid
TEMP	Temperature-fluid
IND	Induction
POR(SON)	Sonic Porosity
FLOW	Impeller-type flowmeter

4.0 GEOLOGY

The ROMP 5 well site is located within the Gulf Coastal Lowlands physiographic province, a division of the Mid-Peninsular zone of the Floridan Peninsula (White, 1970). The well site is within the SWFWMD Peace River Basin and is located southeast of Shell Creek, a tributary to the Peace River. The well site elevation is approximately 40 ft NGVD.

4.1 STRATIGRAPHY

The ROMP 5 well site stratigraphy was defined from descriptions of the continuous lithologic core samples collected during core drilling from land surface to 1,304 ft bls and from the drill cuttings collected during rotary drilling from 1,300 ft bls to 1,776 ft bls. Figure 11 depicts the geology and hydrogeology described at the ROMP 5 well site. The lithologic log for ROMP 5 is presented in Appendix A.

4.1.1 Undifferentiated Surficial Deposits

The Pliocene to Recent age Undifferentiated Surficial deposits is the uppermost geologic unit at the ROMP 5 well site. This unit is comprised of fine to medium grained, unconsolidated, quartz sand, with some interbedded silt, clay and organic matter. The undifferentiated Surficial deposits extend from land surface to 9 ft bls.

4.1.2 Caloosahatchee Formation

The Caloosahatchee Formation, Pliocene to Pleistocene in age, underlies the undifferentiated Surficial deposits and extends from 9 ft bls to 49 ft bls. The Caloosahatchee is comprised of a series of sand, shell, and limestone beds. The upper part of the formation is comprised of fine to medium grained, unconsolidated quartz sand, and mollusk and pelecypod shell beds (Dubar, 1962). Underlying the sand and shell beds are sequences of moldic, fossiliferous, calcilutite with interbedded sand and clay.

4.1.3 Tamiami Formation

The Tamiami Formation underlies the Caloosahatchee Formation and extends from 49 ft bls to 128 ft bls. Highly permeable sequences of interbedded quartz and phosphatic sands, and fossiliferous limestone are present from 49 ft bls to 84 ft bls. These beds overly a thick sequence of low permeability clay extending from 84 ft bls to 128 ft bls. This unit termed the Venice Clay, a name first used by Joyner and Sutcliffe (1976), is comprised of dark greenish-gray, plastic, clay, with minor amounts of interbedded quartz sand. In the area of ROMP 5 the Venice Clay forms the confining unit between the surficial and intermediate aquifers.

4.1.4 Peace River Formation

The Peace River Formation is a lower Pliocene to Miocene age marine siliclastic unit that lies unconformably below the Venice Clay. The Peace River Formation is part of the Hawthorn Group sediments described by Scott (1988). In the area of ROMP 5 the Peace River Formation is comprised of a thick sequence of siliclastic sediments extending from 128 ft bls to 432 ft bls. Alternating beds of

quartz and phosphatic sand, interbedded clay, sandstone, and sandy, fossiliferous limestone make up the numerous high and low permeability beds within this unit.

4.1.5 Arcadia Formation

The Arcadia Formation, middle-Miocene in age underlies the Peace River Formation. The Arcadia Formation as described by Scott (1988), consists primarily of limestone and dolostone with some quartz sand, clay and phosphate grains. The Arcadia Formation, part of the Hawthorn Group sediments, includes the Tampa and Nocatee members in some areas of South Florida. In the area of ROMP 5 the Arcadia extends from 432 ft bls to 711 ft bls. The Tampa Member was not present but the primarily siliclastic Nocatee Member was described from 508 ft bls to 561 ft bls. The upper part of the Arcadia Formation is characterized by moderately indurated calcarenite, with interbedded quartz sand, phosphatic sand and gravel, and some clay and dolostone. Foram, mollusk, and echinoid molds are common and account for the high permeability in the upper part of the unit. The Nocatee Member contains beds of low permeability clay, limestone, and dolostone with interbedded quartz and phosphatic sand. Below the Nocatee Member, the lower part of the Arcadia Formation consists primarily of thin beds of dolostone, limestone, and clay interbedded with minor amounts of quartz and phosphatic sand. Dolostone is the predominate carbonate in the lower part of the formation and exhibits low porosity and permeability.

4.1.6 Suwannee Limestone

The Suwannee Limestone is Oligocene in age and extends from 711 ft bls to 989 ft bls at the ROMP 5 well site. The Suwannee Limestone is distinguished from the overlying Arcadia Formation by the absence of phosphatic sediments. The Suwannee consists of a chalky, fossliferous, limestone alternating with thin beds of clay, dolostone, and quartz sand. Limestone beds are primarily sandy, clayey calcarenite, poor to moderate induration with varying permeability. Several distinct beds of unconsolidated quartz sand and thin beds of quartz sandstone were noted during coring.

4.1.7 Ocala Limestone

Eocene in age, the Ocala Limestone extends from 989 ft bls to 1,080 ft bls at ROMP 5. The Ocala is a highly fossiliferous, fine-grained, poorly cemented shallow marine limestone. The limestone is predominantly a chalky, foraminiferal calcarenite or calcilutite with minor interbedded quartz sand and clay. Some thin dolostone lenses are also present. Common foraminifera include *Lepidocyclina sp.* and *Nummulites sp.* Pelecypods, gastropods, milliolids, and echinoids are also common. In the ROMP 5 area the Ocala Limestone is generally of low permeability.

4.1.8 Avon Park Formation

The Avon Park Formation is Eocene in age and extends from 1,080 ft bls to more than 1,776 ft bls in the vicinity of ROMP 5. Coring was stopped at 1,304 ft bls during this phase of drilling. The Avon Park Formation is characterized by alternating beds of well indurated, fossiliferous limestone and dolostone. A thick sequence (1,080 ft bls to 1,114 ft bls) of fine-grained, fractured dolostone is present at the top of the Avon Park Formation near the Ocala Limestone contact. A medium-grained well indurated calcarenite alternating with thin beds of dolostone and clay is present from 1,114 ft bls to approximately 1,350 ft bls.

5.0 HYDROLOGY

The ROMP 5 well site hydrogeology was defined during initial wire-line coring and exploratory drilling. Aquifer systems were delineated from lithologic descriptions of permeable and non-permeable units, potentiometric levels, and water quality data collected during drilling. Changes in water levels were recorded while core drilling through the various aquifers. Figure 12 presents a graph of the water levels versus depth while drilling from land surface to the total cored depth of 1,304 ft bls.

5.1 SURFICIAL AQUIFER SYSTEM

The surficial aquifer system is an unconfined aquifer that extends from land surface to approximately 84 ft bls at the ROMP 5 well site. Sediments of the undifferentiated surficial deposits, Caloosahatchee Formation, and Tamiami Formation comprise the surficial aquifer. The base of the aquifer is formed

by the relatively impermeable clays of the Venice Clay Formation. The Venice Clay extends from 84 ft bls to 130 ft bls. The water level in the surficial aquifer ranges seasonally from less than one ft bls to five ft bls.

5.2 INTERMEDIATE AQUIFER SYSTEM

The intermediate aquifer system is a confined aquifer system located between the overlying surficial aquifer system and the underlying Upper Floridan Aquifer System. In the area of ROMP 5 the intermediate aquifer system is comprised of a series of transmissive and confining units of the Peace River Formation and Arcadia Formation. The intermediate aquifer system is approximately 624 ft thick and extends from 85 ft bls to 709 ft bls at the ROMP 5 well site.

In some areas of Charlotte County three separate permeable artesian zones have been described within the intermediate aquifer system (Sutcliffe, 1975). At ROMP 5 two permeable zones were delineated within the intermediate aquifer system. A third permeable zone, sometimes described as lying just above the Venice Clay but hydraulically separated from the surficial aquifer (Barr, 1996), was not identified at ROMP 5. The first or upper permeable zone is located within the Peace River Formation and extends from 130 ft bls to 230 ft bls. The second or lower permeable zone is located within the Arcadia Formation and Nocatee Member sediments and extends from 450 ft bls to 600 ft bls.

The potentiometric surface of the upper permeable zone at ROMP 5 varies seasonally from 5 ft bls to 10 ft bls. Figures 13 and 14 present maps (prepared by USGS) of the potentiometric surface of the upper zone of the intermediate aquifer in May and September, 1996.

The potentiometric surface of the lower permeable zone at ROMP 5 varies from about 5 ft above land surface (als) to 10 ft als. Potentiometric maps of the lower zones of the intermediate aquifer prepared by the USGS are produced from data collected from wells penetrating multiple zones of the intermediate aquifer. The resulting potentiometric contour lines are composites of several permeable zones. Potentiometric maps of only the lower zone of the intermediate aquifer monitored at the ROMP 5 site are not available.

5.3 UPPER FLORIDAN AQUIFER

The Upper Floridan aquifer in the vicinity of ROMP 5 extends from approximately 710 ft bls to greater than 1,776 ft bls. The top of the Upper Floridan aquifer coincides with the top of the Oligocene Age Suwannee Limestone at approximately 710 ft bls. The base of the Upper Floridan aquifer typically is marked by a transition from massive dolostone of the Avon Park Formation, to beds of vertically persistent, intergranular evaporites termed "middle confining unit" by Ryder (1985).

The Upper Floridan aquifer is comprised of the Suwannee Limestone, Ocala Limestone, and Avon Park Formation. The low permeability beds of the Ocala Limestone act as a semi-confining unit between the transmissive beds of the overlying Suwannee Limestone and the underlying Avon Park Formation.

Exploratory drilling (**ROMP 5 Volume Two- Exploratory Drilling and Testing Report**) in the Avon Park section of the Upper Floridan Aquifer revealed moderately permeable beds of calcarenite and dolostone from 1,080 ft bls to 1,350 ft bls. The top of the highly permeable dolostone zone of the Upper Floridan Aquifer, previously mapped by Wolansky and others (1980) occurs at 1,350 ft bls. A highly transmissive flow zone extends from 1,350 ft bls to 1, 400 ft bls. Caliper logs and borehole video surveys conducted during the exploratory drilling phase indicate this area is comprised of highly fractured, cavernous, dolostone. Permeable dolostone and limestone persists from 1,400 ft bls to 1,775 ft bls but fracturing is less prominent than the 1,350 to 1,400 ft zone.

The potentiometric surface of the Upper Floridan aquifer at ROMP 5 varies seasonally from approximately 7 ft als to 12 ft als. Potentiometric maps prepared by the USGS indicate the potentiometric surface of the Upper Floridan Aquifer in the area of ROMP 5 ranged from approximately 48 ft NGVD in September 1996 to 50 ft NGVD in May 1996 (Figures 15 and 16).

6.0 GROUND-WATER QUALITY

Ground-water samples were collected from the surficial, intermediate, and Upper Floridan aquifers at 20 to 40 ft intervals while core drilling from land surface to 1,304 ft bls at the ROMP 5 well site. All samples were collected using the stainless steel bailer shown in Figure 7. The results of ground-water quality

samples are presented in Tables 1 and 2. Figure 17 presents graphs of the chloride and sulfate concentrations and the specific conductance values of ground-water samples collected while core drilling from land surface to 1,304 ft bls.

6.1 SURFICIAL AQUIFER SYSTEM

One ground-water sample was collected from the surficial aquifer (land surface to 84 ft bls) at a depth of 20 ft bls during coring at ROMP 5. Specific conductance was 1, 391 umhos/centimeter (cm) (Table 1). Chloride and sulfate concentrations were 229 milligrams per liter (mg/l) and 10 mg/l, respectively (Table 2).

6.2 INTERMEDIATE AQUIFER SYSTEM

Ground-water samples were collected at approximately 20 ft intervals while core drilling through the intermediate aquifer (85 ft bls to 709 ft bls) during coring. Water quality in the upper permeable zone of the intermediate aquifer (130 ft bls to 230 ft bls) is comparatively fresher than that of the lower permeable zone (450 ft bls to 600 ft bls).

Specific conductance values for samples collected from the upper permeable zone ranged from 1,820 umhos/cm at 129 ft bls to 882 umhos/cm at 209 ft bls (Table 1). Chloride concentrations ranged from 198 mg/l at 129 ft bls to 156 mg/l at 209 ft bls. Sulfate concentrations ranged from 3 mg/l at 129 ft bls to 13 mg/l at 209 ft bls (Table 2).

Specific conductance values for samples collected from the lower permeable zone ranged from 1,671 umhos/cm at 489 ft bls to 2,940 umhos/cm at 609 ft bls (Table 1). Chloride concentrations increased from 436 mg/l at 489 ft bls to 814 mg/l at 609 ft bls. Sulfate concentrations increased from 74 mg/l at 489 ft bls to 216 mg/l at 609 ft bls (Table 2).

6.3 UPPER FLORIDAN AQUIFER

Ground-water samples were collected at approximately 20 ft intervals from 709 ft bls to 1,304 ft bls while core drilling through the Upper Floridan aquifer at ROMP 5. A marked change in water quality occurred

upon drilling into the Upper Floridan. Initial water quality samples collected at the top of the Upper Floridan aquifer (709 ft bls) were less mineralized than the samples collected at 689 ft bls in the intermediate aquifer system (Table 2). However, mineralization of ground-water increased with depth as drilling continued into the Upper Floridan. Specific conductance values of the samples increased from 1,480 umhos/cm at 709 ft bls to 3,330 umhos/cm at 1,304 ft bls (Table 1). Chloride concentrations increased from 344 mg/l at 709 ft bls to 911 mg/l at 1,304 ft bls. Sulfate concentrations increased from 210 mg/l at 709 ft bls to 243 mg/l at 1,304 ft bls (Table 2). Additional water quality data with depth (1,300 ft bls to 1,776 ft bls) is presented in the ROMP 5 report: **Volume Two-Exploratory Drilling and Testing**.

7.0 HYDRAULIC DATA

Vertical hydraulic conductivity values were calculated for six core samples collected while drilling in the intermediate and Upper Floridan aquifers at ROMP 5. Falling-head permeameter tests were conducted on core samples collected from sections of the Nocatee Member of the Arcadia Formation, the Suwannee Limestone, the Ocala Limestone, and the Avon Park Formation. Core samples exhibiting low visible porosity were selected, to determine relative confining properties between and within permeable zones in the intermediate and Upper Floridan aquifers. Permeameter test results are presented in Table 4. Additional hydraulic data collected from aquifer performance tests will be presented in the ROMP 5 report: **Volume Three-Aquifer Performance Testing**.

8.0 SUMMARY

Core drilling and testing, the first phase of a hydrogeologic investigation was conducted at the ROMP 5 Cecil Webb monitor well site from June 1993 to December 1993. The wire-line coring method was used to collect continuous lithologic core from land surface to 1,304 ft bls for description and stratigraphic correlation. Ground-water samples were collected at 20 to 40 foot intervals during coring to characterize the water quality in the surficial, intermediate, and Upper Floridan aquifers. Water levels were measured daily, while coring in the surficial, intermediate and Upper Floridan aquifers. Daily logs prepared by the site geologist are presented in Appendix B.

The results of the coring investigation indicate the ROMP 5 well site is underlain by a thick unconfined surficial aquifer (84 feet), an artesian intermediate aquifer with two separate permeable zones (130 ft bls to 230 ft bls and 450 ft bls to 600 ft bls) and the artesian Upper Floridan aquifer (720 ft bls to > 1,304 ft bls). Water quality in the surficial aquifer is generally good with most parameters within potable limits. Ground-water samples collected from the upper permeable zone of the intermediate aquifer were within potable limits. Samples collected from the lower permeable zone generally exceeded potable limits. Water quality within the Upper Floridan aquifer is close to potable limits near the top of the aquifer but becomes more mineralized with depth.

Two temporary observation wells were constructed from the former core-holes following the completion of the coring and testing. The temporary observation wells were used to monitor water levels during aquifer performance tests at ROMP 5. A two inch diameter upper intermediate observation well was constructed from the first core-hole. A two inch diameter Suwannee/Upper Floridan observation well was constructed from the second core-hole. The two temporary wells will be plugged at the completion of site activities at ROMP 5.

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FIGURES

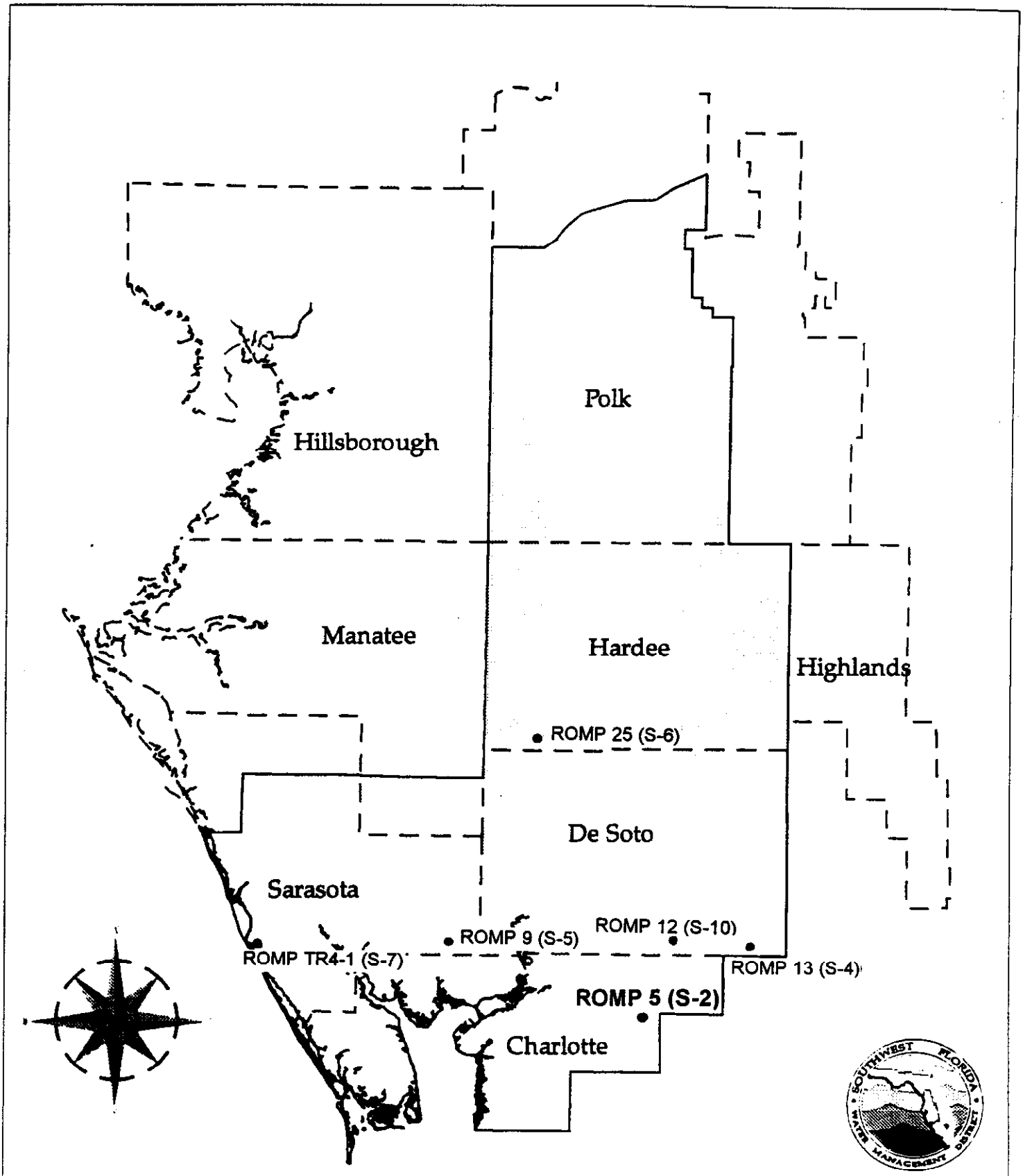

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FIGURE 1. ROMP 5 CECIL WEBB

Southern District Water Resources Assessment Project Area

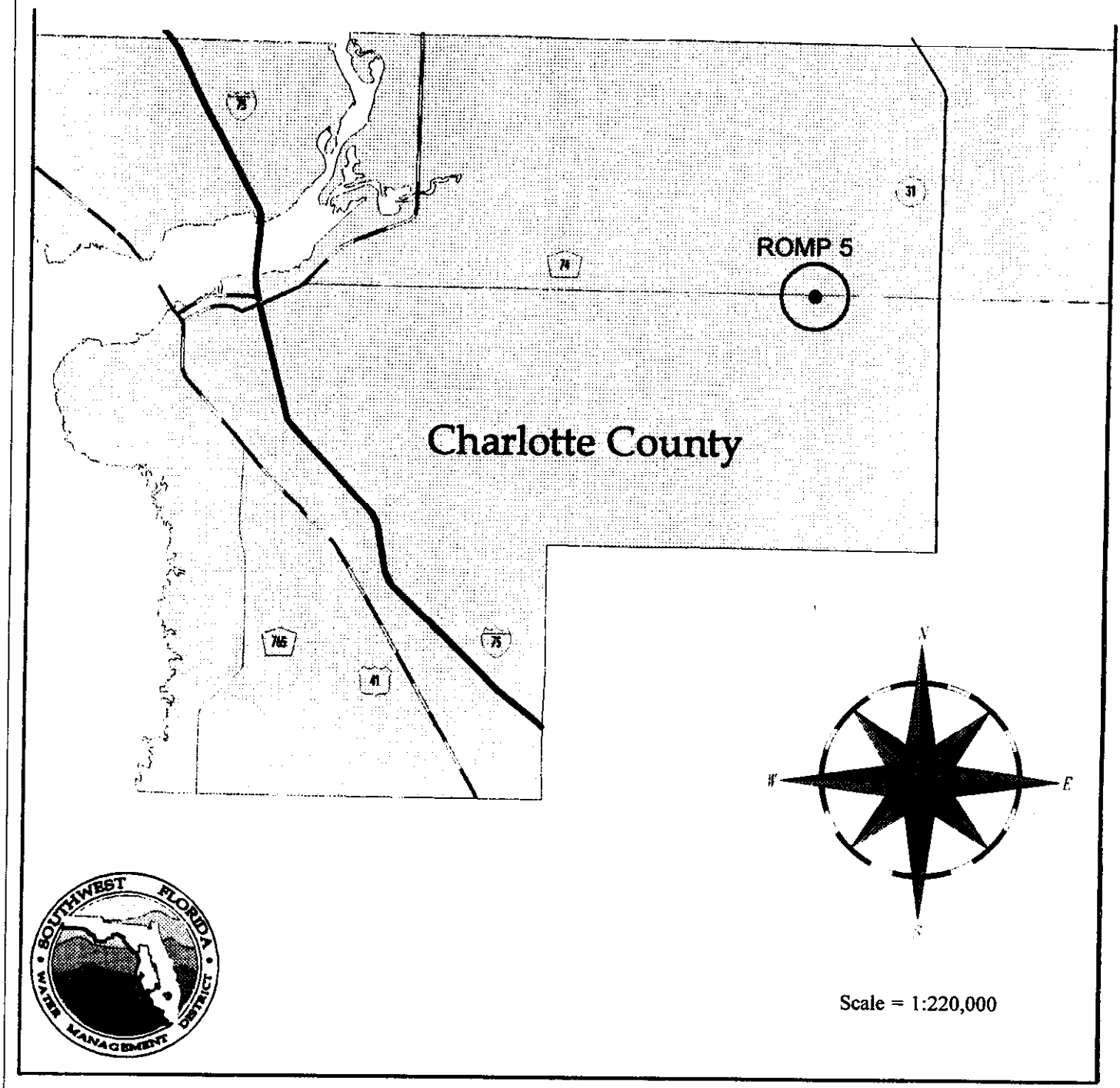


FIGURE 2. ROMP 5 CECIL WEBB

General Location Map

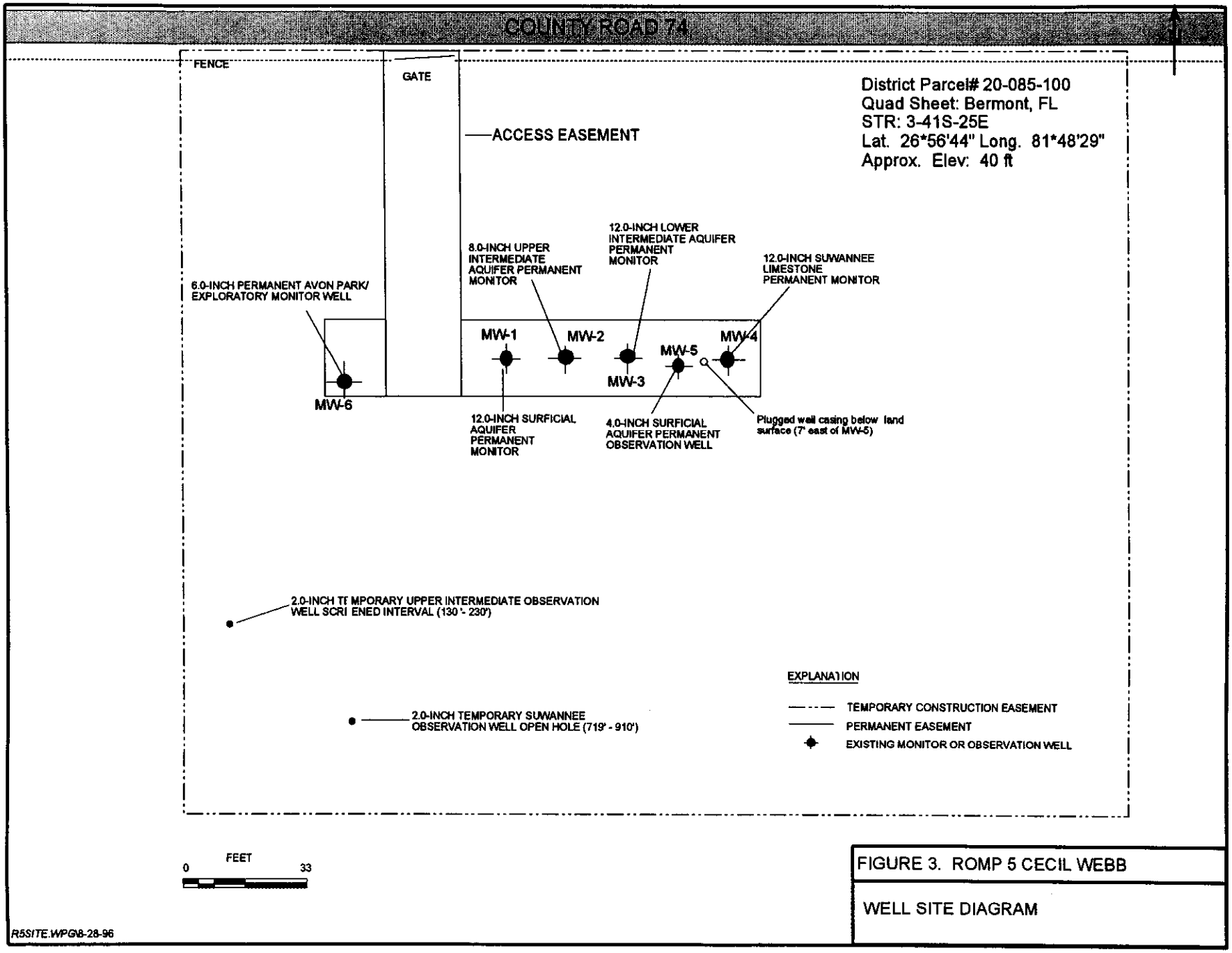


FIGURE 3. ROMP 5 CECIL WEBB

WELL SITE DIAGRAM

R5SITE.WPG\8-28-96

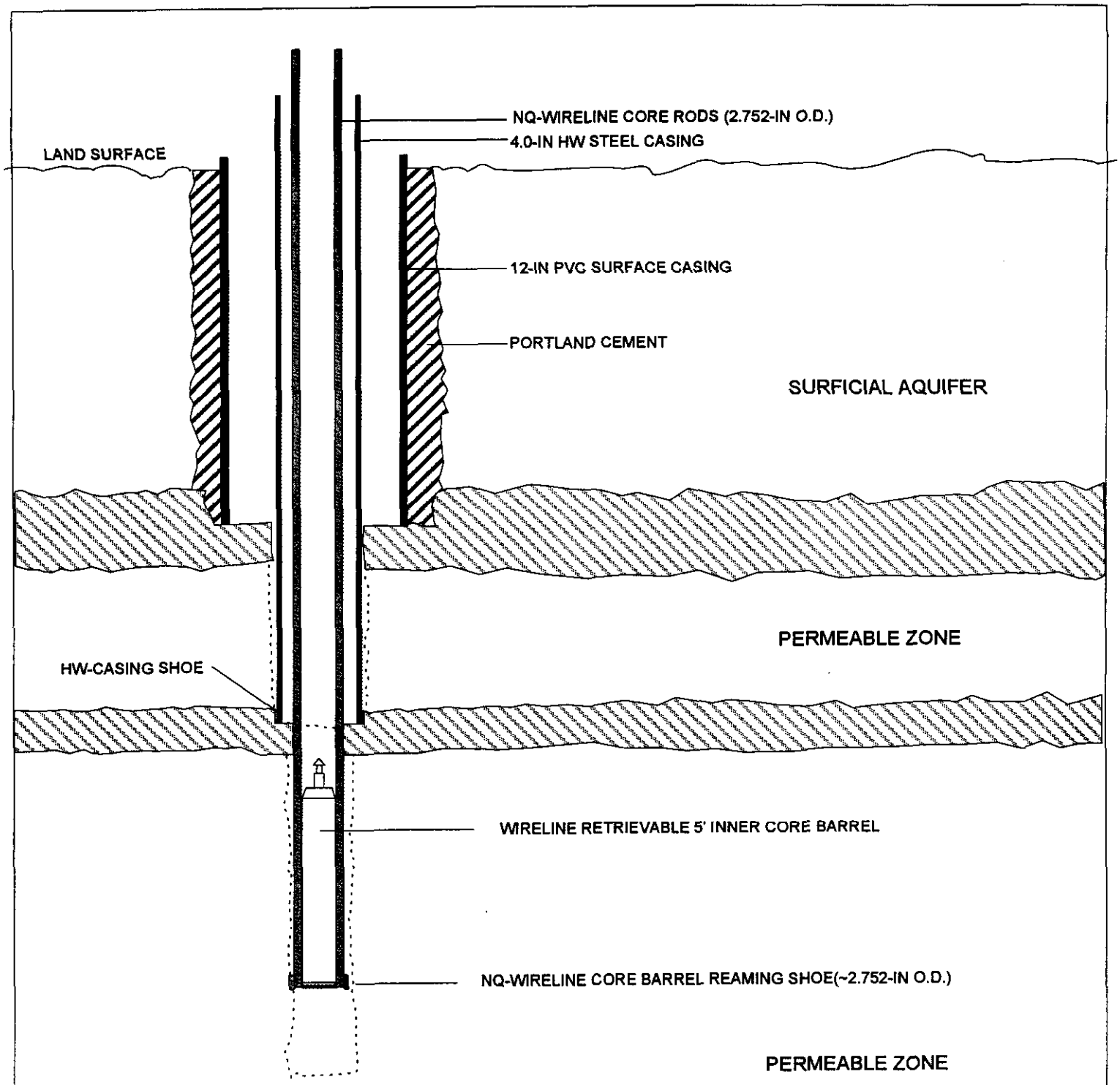


FIGURE 4 ROMP 5 CECIL WEBB

CORE DRILLING DIAGRAM

cordrill.wpg

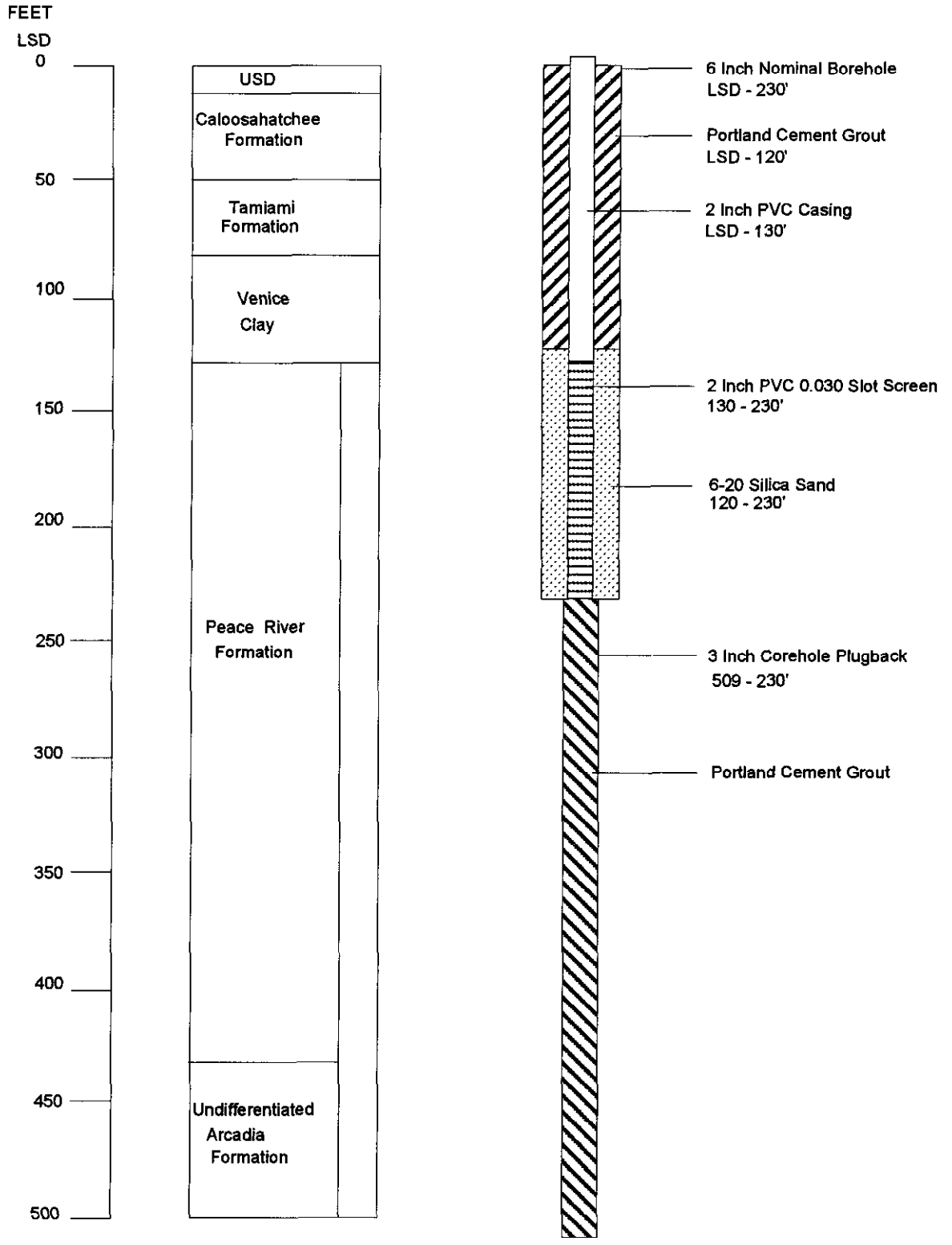


FIGURE 5. ROMP5 CECIL WEBB

INTERMEDIATE AQUIFER
TEMPORARY OBSERVATION WELL

lastempob.wpg

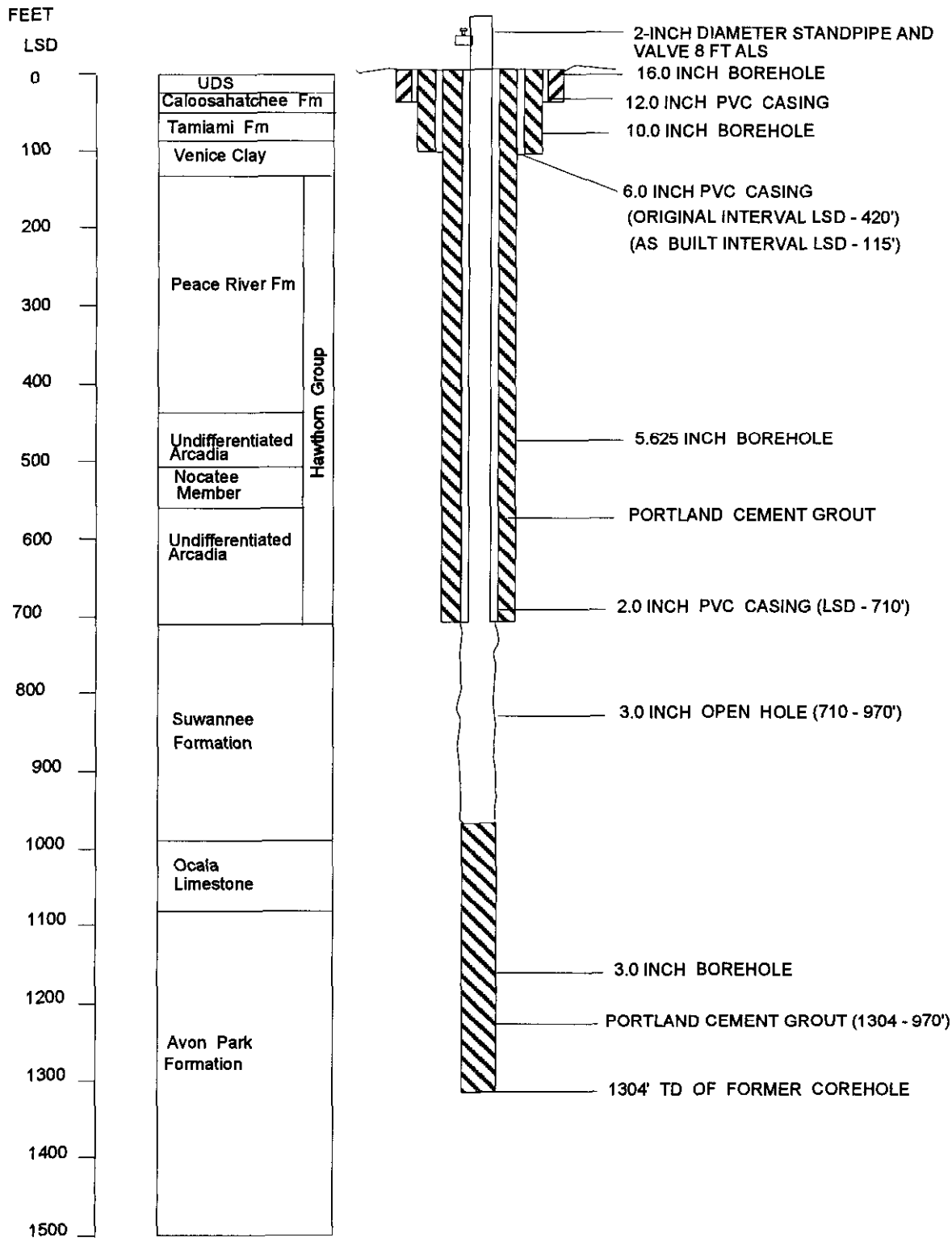


FIGURE 6. ROMP 5 CECIL WEBB

SUWANNEE/UPPER FLORIDAN TEMPORARY OBSERVATION WELL

R5suwob.wpg

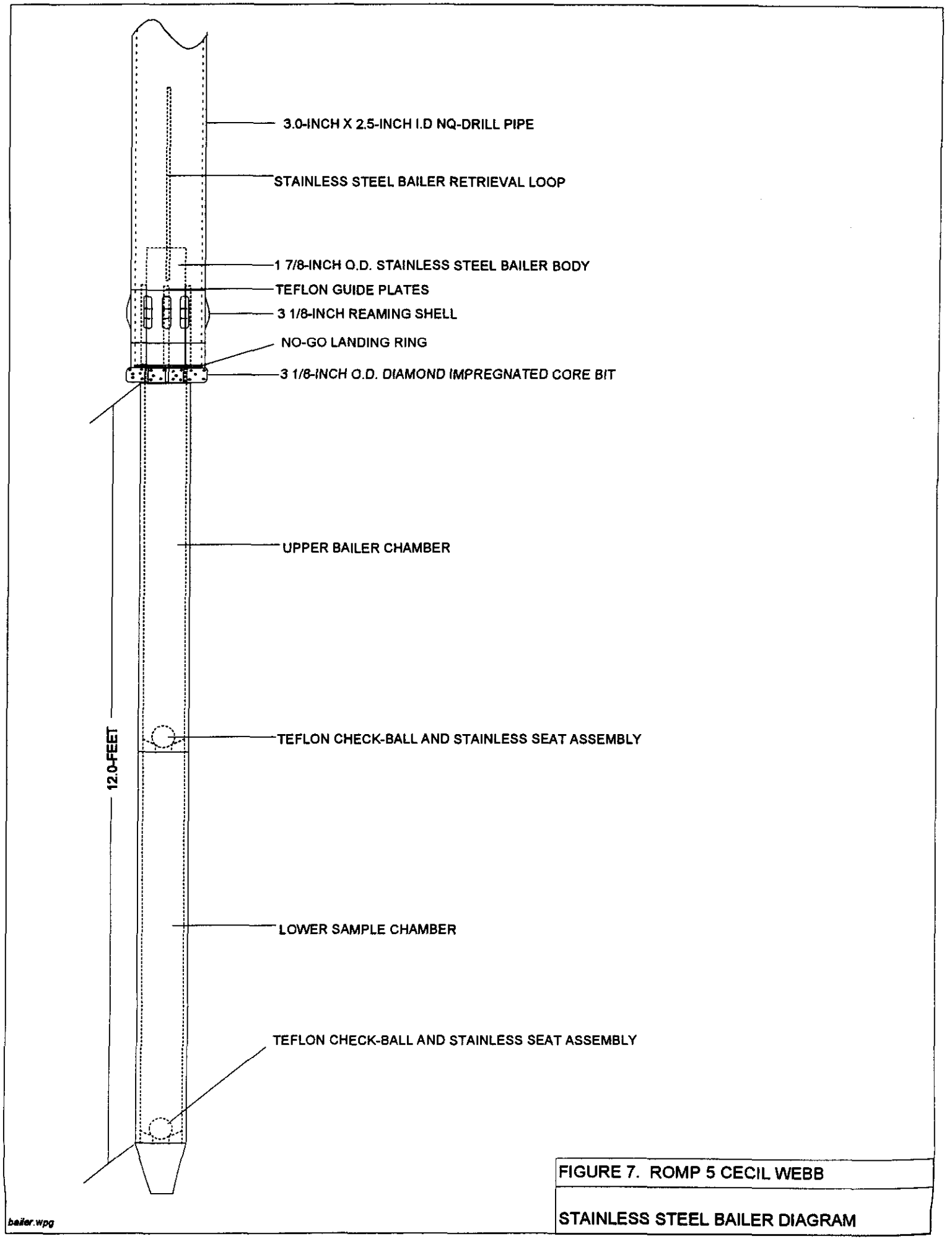
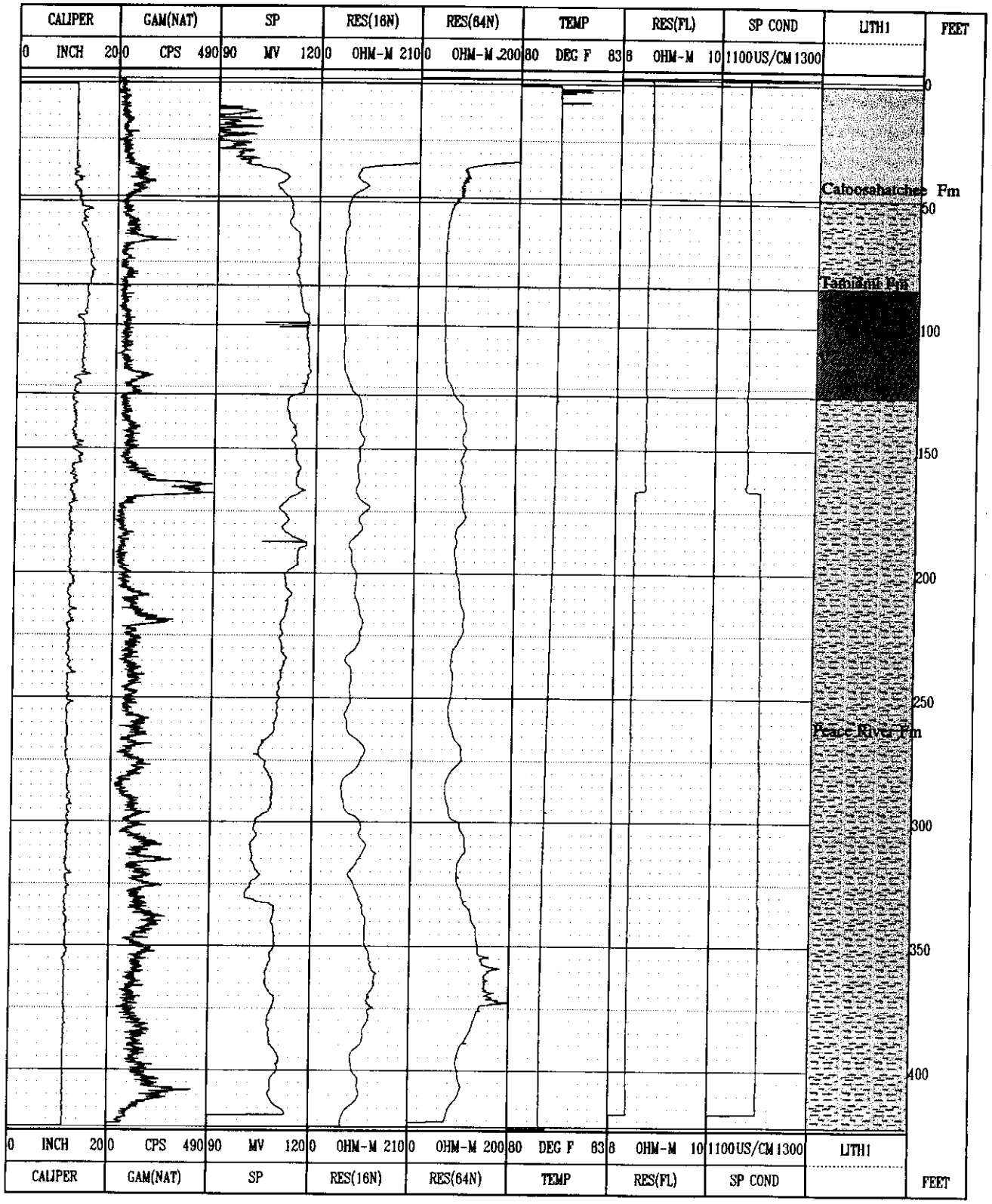


FIGURE 7. ROMP 5 CECIL WEBB

STAINLESS STEEL BAILER DIAGRAM

bailer.wpg

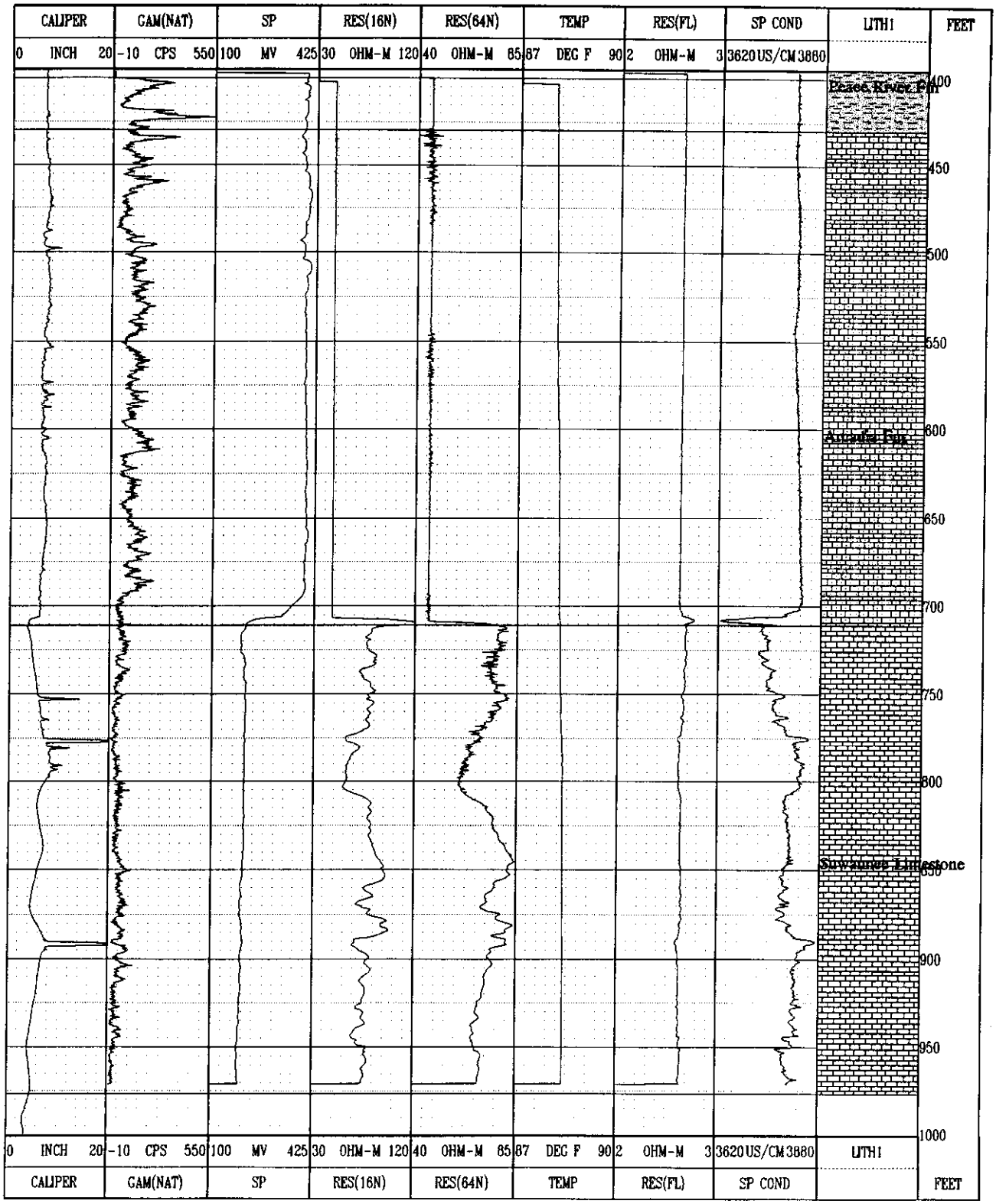


12" PVC Casing 0 - 36 ft bls Corehole No. 1

FIGURE 8. ROMP 5 CECIL WEBB

Geophysical Logs 36 - 420 ft bls

Acl\plot\5cr420pl

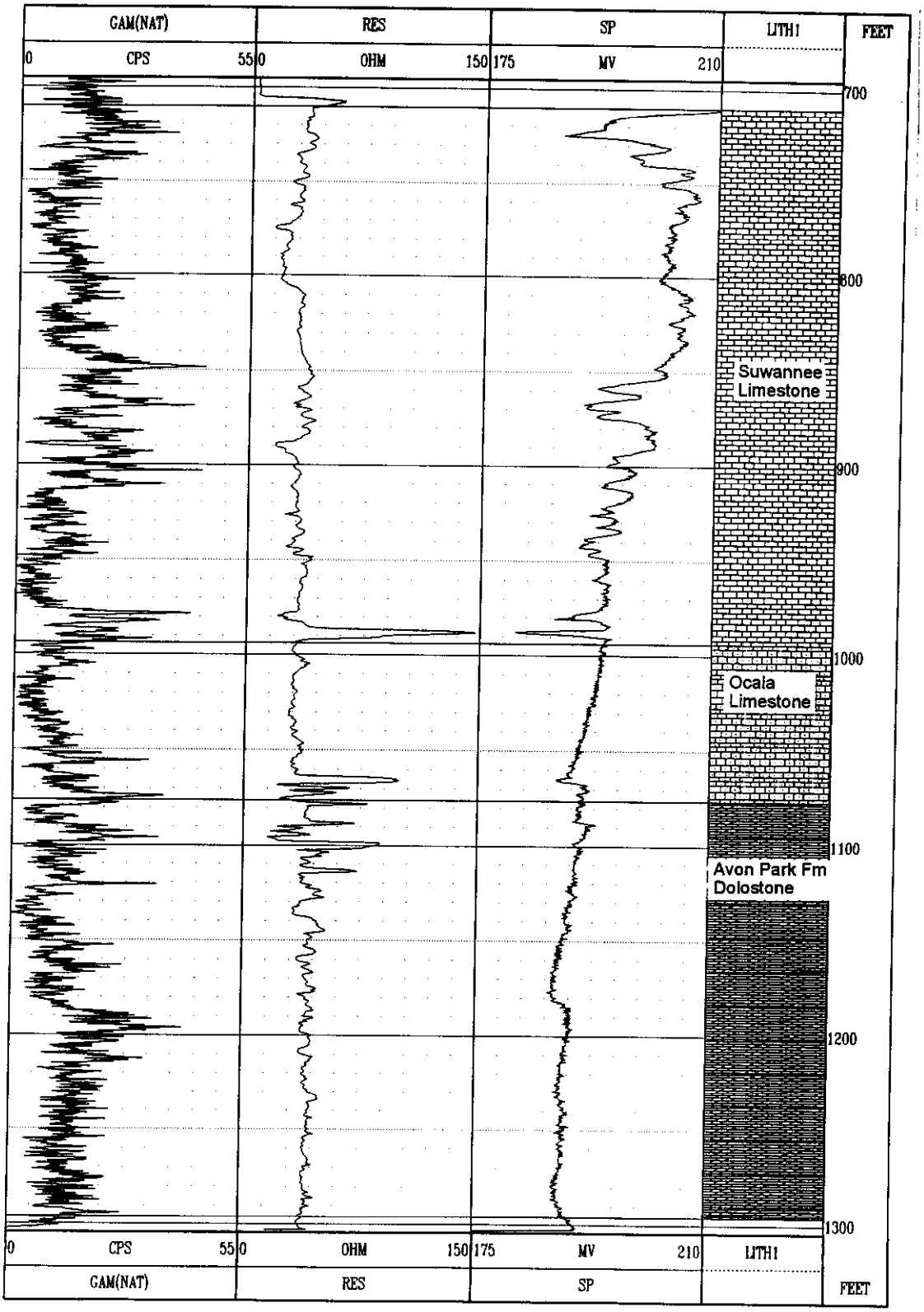


4" Steel Casing 0 - 125 ft bls Corehole No. 1

FIGURE 9. ROMP 5 CECIL WEBB

Geophysical Logs 400 - 1005 ft bls

Acf\plots\5cr10005



4" Steel Casing 0 - 700 ft bls Corehole No. 2

FIGURE 10. ROMP 5 CECIL WEBB

Geophysical Logs 700-1300 ft bls

Acl/plot/5cr1304pl

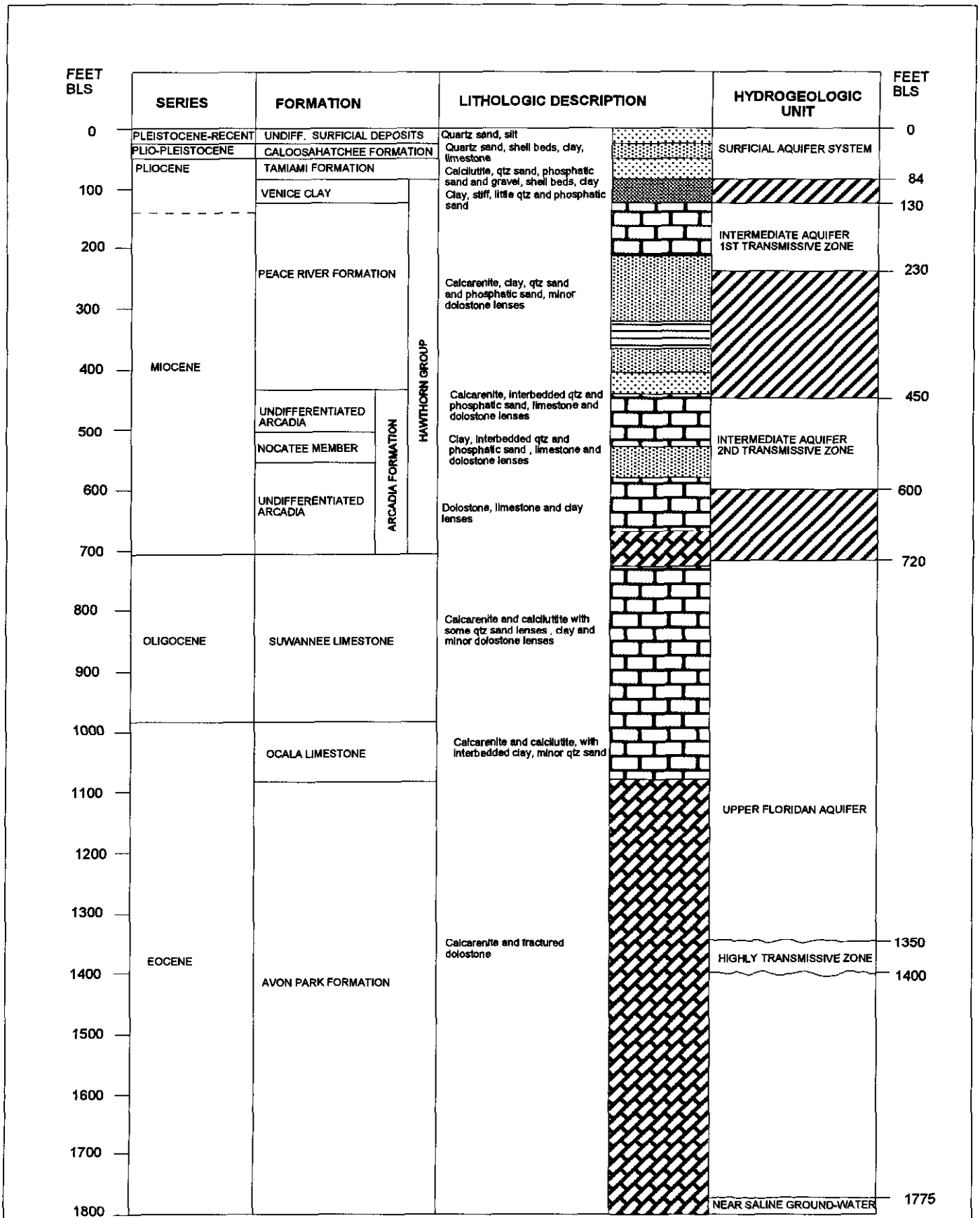


FIGURE 11. ROMP 5 CECIL WEBB

HYDROGEOLOGY

R5hydr3.wpg

WATER LEVELS DURING CORING

JUNE - NOVEMBER 1993

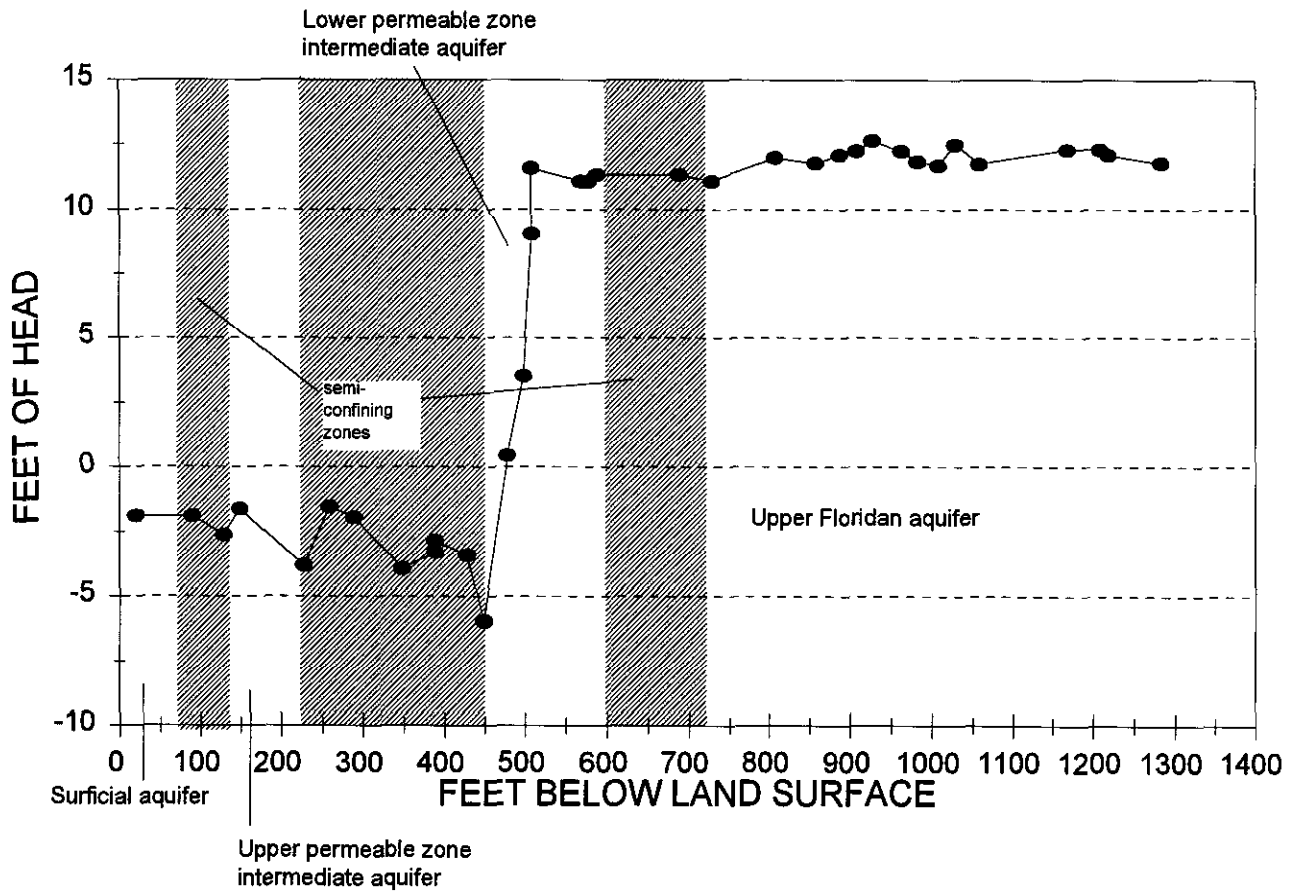
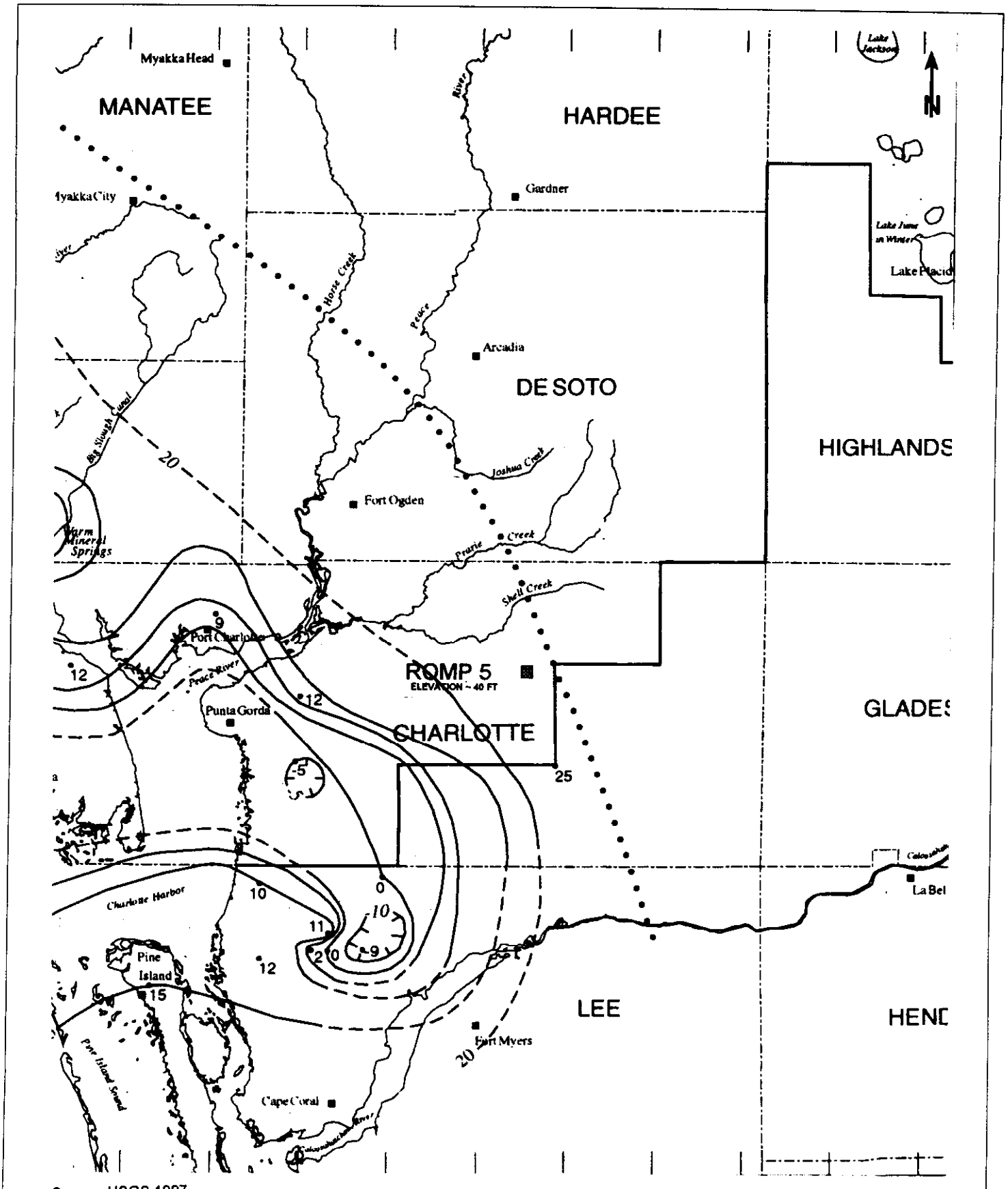


FIGURE 12. ROMP 5 CECIL WEBB
Water Levels During Coring



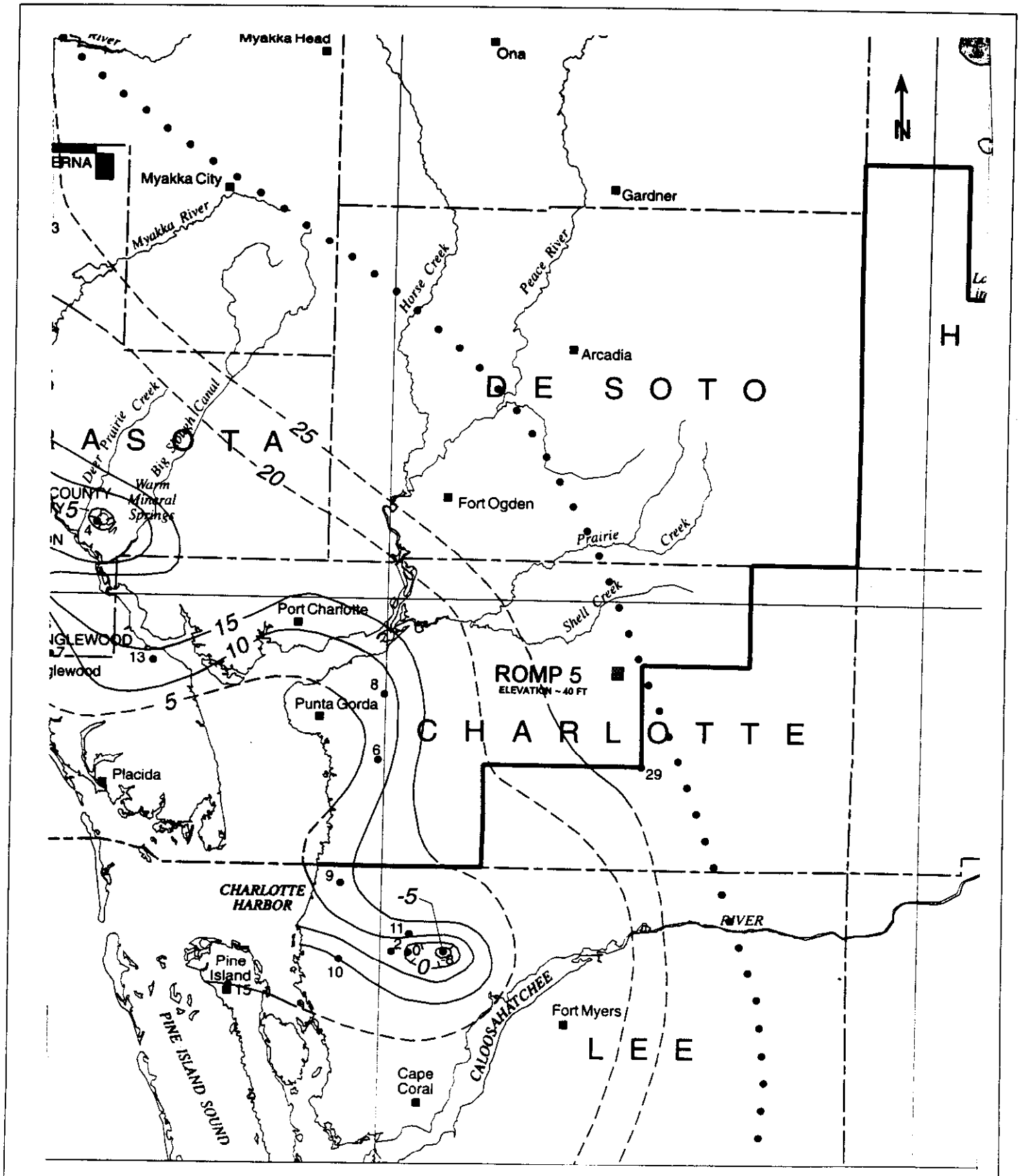
Source: USGS 1997

Scale:1" = 8.5 Miles

Figfm.wpg

FIGURE 13. ROMP 5 CECIL WEBB

Potentiometric Surface of the Upper Permeable Zone of the Intermediate Aquifer May1996



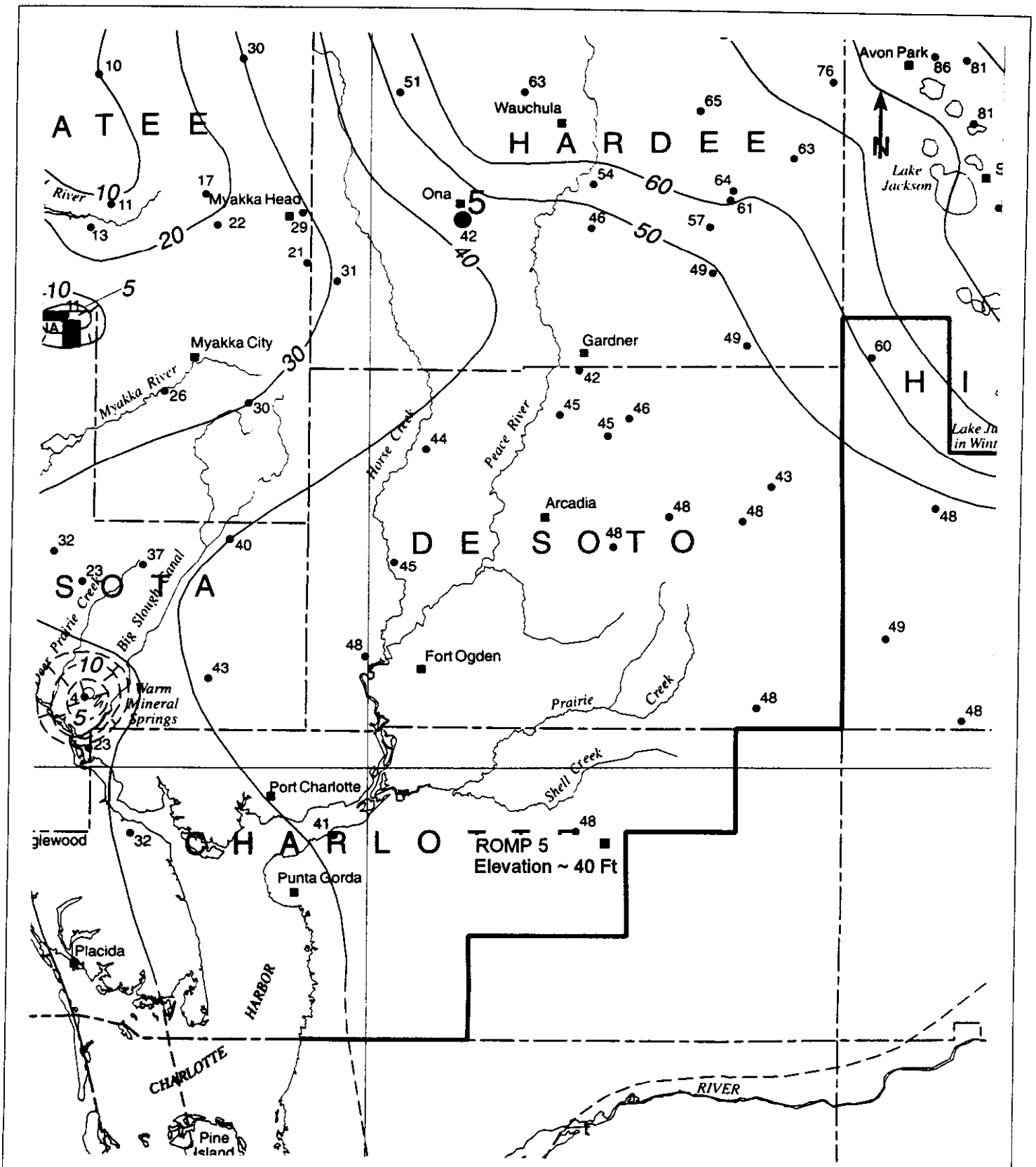
Source: USGS 1997

Scale:1" = 8.5 Miles

FIGURE 14. ROMP 5 CECIL WEBB

Potentiometric Surface of the Upper Permeable Zone of the Intermediate Aquifer September 1996

Figfm.wpg



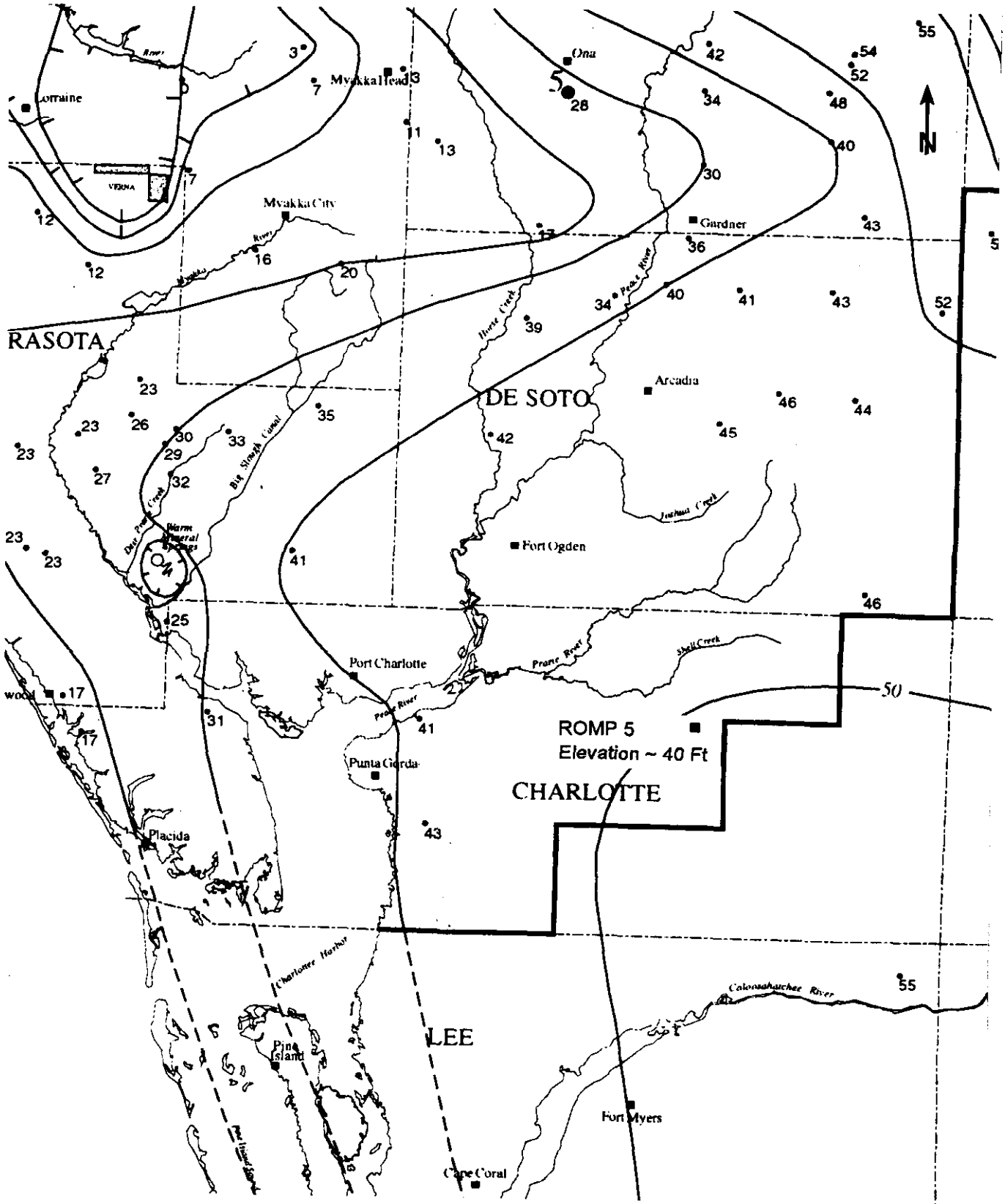
Source: USGS 1997

Scale:1" = 8.5 Miles

FIGURE 15. ROMP 5 CECIL WEBB

Potentiometric Surface of the Upper Floridan Aquifer September 1996

Figfm.wpg



Source: USGS 1996

Scale:1" = 8.5 Miles

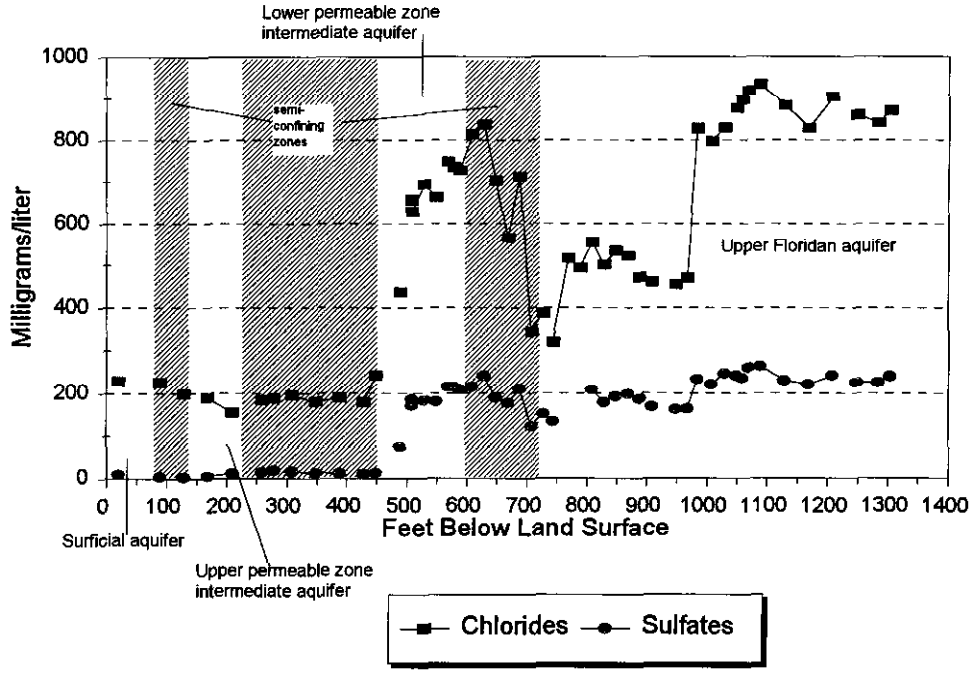
FIGURE 16. ROMP 5 CECIL WEBB

Potentiometric Surface of the Upper Floridan Aquifer May 1996

Figfm.wpg

ROMP 5 CECIL WEBB

Cl & SO4 Concentrations During Coring



ROMP 5 CECIL WEBB

Specific Conductance During Coring

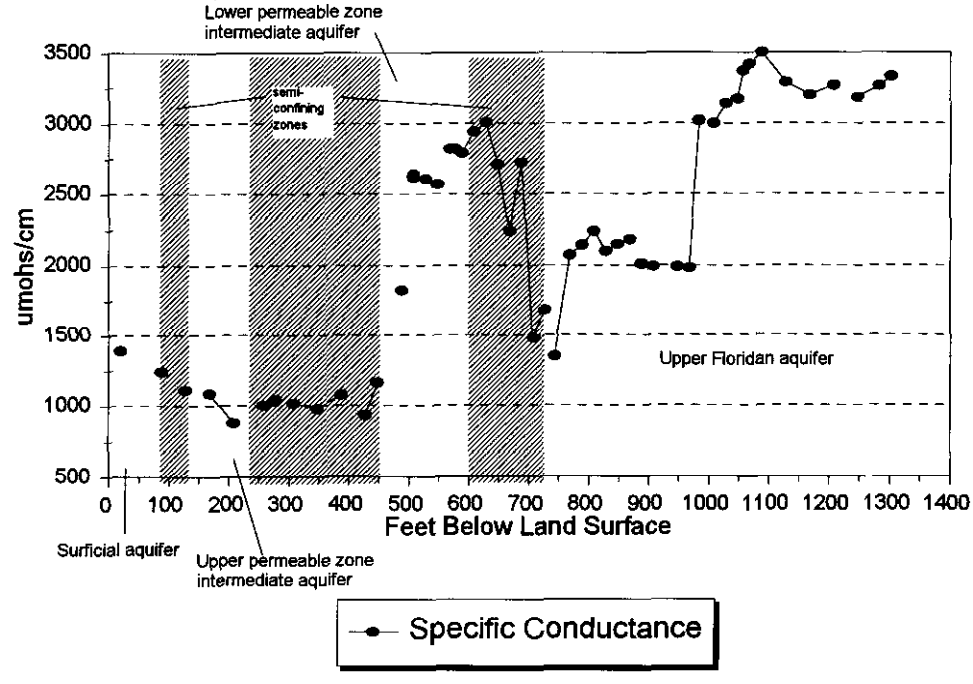


FIGURE 17. ROMP 5 CECIL WEBB

CHLORIDE, SULFATE, AND SPECIFIC CONDUCTANCE OF GROUND-WATER SAMPLES

TABLES

Table 1. Field Analyses of ROMP 5 Bailer Samples Collected During Coring

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond (umhos)	H20 Temp (celsius)	H20 Density (g/cm3)	CL (mg/l)	SO4 (mg/l)	pH
06/09/93	1700	20	1391	27.0	1.000	N/A	N/A	7.26

Sample collected through 6-in augers, casing not yet installed

N/A Not Analyzed

Table 1. (continued)

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond (umhos)	H20 Temp (celsius)	H20 Density (g/cm3)	CL (mg/l)	SO4 (mg/l)	pH
06/14/93	1645	89	1240	25.7	1.000	320	<50	7.01
06/15/93	1335	129	1109	26.8	1.000	340	<50	7.56
06/16/93	1120	169	1089	25.5	1.000	320	<50	7.09
06/17/93	1300	209	882	26.4	1.000	320	<50	7.81
06/22/93	1045	259	1002	26.0	N/A	280	<50	7.46
06/22/93	1400	279	1040	26.6	N/A	320	<50	7.52
06/23/93	1230	309	1016	25.6	N/A	300	<50	7.58
06/24/93	0930	349	981	26.2	N/A	300	<50	7.60
06/29/93	1305	389	1079	26.8	N/A	300	<50	7.53
07/01/93	1440	429	935	25.6	N/A	320	<50	7.80
07/06/93	1415	449	1166	27.0	N/A	420	<50	7.45
07/07/93	1410	489	1820	26.8	N/A	620	150	7.66
07/08/93	1310	509	2640	28.3	N/A	900	300	7.64

4" Steel casing 0-36' bls

N/A Not Analyzed

Table 1. (continued)

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond (umhos)	H20 Temp (celsius)	H20 Density (g/cm3)	CL (mg/l)	SO4 (mg/l)	pH
09/22/93	0830	509	2620	27.2	N/A	920	300	7.70
09/22/93	1215	529	2610	28.2	N/A	960	300	8.03
09/22/93	1530	549	2570	28.9	N/A	N/A	N/A	8.07
09/23/93	0940	569	2820	28.5	N/A	1040	300	7.76
09/23/93	1300	579	2820	29.0	N/A	1040	300	7.59
09/27/93	1200	589	2790	29.0	N/A	N/A	N/A	8.13
09/27/93	1530	609	2940	29.1	N/A	1080	400	7.91
09/28/93	0930	629	3010	28.6	N/A	1100	400	7.55
09/28/93	1330	649	2710	29.0	N/A	N/A	N/A	8.17
09/28/93	1600	669	2240	29.0	N/A	780	350	8.11
09/29/93	0930	689	2720	28.0	N/A	920	350	7.74
09/29/93	1345	709	1480	29.2	N/A	460	200	8.11
09/30/93	0840	729	1680	29	N/A	480	250	8.01

4" Steel casing 0-480' bls

N/A Not Analyzed

Table 1. Field Analyses of ROMP 5 Bailer Samples Collected During Coring (continued)

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond (umhos	H20 Temp (celsius)	H20 Density (g/cm3)	CL (mg/l)	SO4 (mg/l)	pH
10/12/93	1540	744	1350	28.6	N/A	400	200	8.71
10/13/93	1620	769	2070	29.2	N/A	680	300	8.16
10/14/93	1400	789	2140	29.3	N/A	N/A	N/A	8.12
10/18/93	0745	809	2240	28.3	N/A	740	300	7.49
10/19/93	1315	829	2100	29.5	N/A	680	300	7.78
10/19/93	1610	849	2150	29.4	N/A	N/A	N/A	8.21
10/20/93	1130	869	2180	29.1	N/A	700	300	8.02
10/21/93	1015	889	2010	29.7	N/A	600	200	7.88
10/25/93	1250	909	1990	29.3	N/A	520	160	8.02
10/26/93	1400	949	1990	29.2	N/A	520	400	8.02
10/27/93	1245	969	1980	29.2	N/A	540	250	8.12
10/27/93	1650	984	3020	30	N/A	960	400	7.93
11/01/93	1330	1009	3000	28.2	N/A	980	400	7.95
11/02/93	0700	1029	3140	29.5	N/A	980	350	7.96
11/02/93	1500	1049	3170	29.5	N/A	1200	500	8.06
11/02/93	1720	1059	3370	29.4	N/A	1280	N/A	8.03
11/03/93	1240	1069	3420	30.4	N/A	1280	400	8.00
11/03/93	1740	1089	3500	30.0	N/A	1300	N/A	7.85
11/09/93	0930	1129	3290	30.5	N/A	1120	360	7.75
11/10/93	1000	1169	3200	30.1	N/A	1080	400	7.93
11/15/93	1545	1209	3270	30.5	N/A	1120	400	7.73
11/16/93	1530	1249	3180	30.3	N/A	1020	350	7.71
11/22/93	1440	1284	3260	29.9	N/A	1260	400	7.86
11/23/93	1100	1304	3330	29.6	N/A	1240	N/A	7.56

4" Steel casing 0-705' bls

r5.wb2

N/A Not Analyzed

Table 2. Laboratory Analyses of ROMP 5 Bailer Samples Collected During Coring*

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond. (umhos)	Water Density (g/cm3)	CL	SO4	pH	Br	TDS	Ca	Mg	Bicarb as (CaCO3)	K	Na	Si	Fe (ug/l)	Total Hardness (CaCO3)	ION %
06/09/93	1700	20	N/A	N/A	229	10.0	N/A	0.00	785	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Sample collected in 6-in augers, casing not yet installed

R5.WB2

* All concentrations reported in mg/l unless otherwise noted

N/A Not Analyzed

Table 2. (continued)

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond. (umohs)	Water Density	CL	SO4	pH	Br	TDS	Ca	Mg	Bicarb as (CaCO3)	K	Na	Si	Fe (ug/l)	Total Hardness (CaCO3)	ION %
06/14/93	1845	89	1266	1.0007	226	4.5	7.4	0.00	775	141	10	298.0	2.7	97	N/A	905	391	1.17
06/15/93	1335	129	1076	1.0006	198	2.8	7.5	0.00	708	119	10	253.0	2.1	78	N/A	1383	347	1.55
06/16/93	1120	169	N/A	N/A	190	5.7	7.9	0.00	670	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/17/93	1300	209	880	1.0005	156	12.5	7.9	0.00	520	71	23	178.0	2.6	62	N/A	335	272	0.11
06/22/93	1045	259	1013	1.0005	185	14	7.6	0.00	640	93	21	204.0	2.2	73	N/A	844	317	0.01
06/22/93	1400	279	N/A	N/A	188	20	N/A	0.00	649	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/23/93	1230	309	968	1.0005	197	17	7.6	0.00	653	89	21	187.0	2.6	77	N/A	763	310	0.2
06/24/93	0930	349	925	1.0005	180	13	7.7	0.00	590	84	21	193.0	2.7	73	N/A	934	297	0.13
06/29/93	1305	389	N/A	N/A	189	12	N/A	N/A	636	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/01/93	1440	429	922	N/A	179	10	7.8	0.53	636	63	32	177.0	5.2	69	N/A	350	289	0.57
07/06/93	1415	449	1065	1.0006	243	13	7.6	0.74	622	69	34	185.0	6.4	97	N/A	393	312	1.1
07/07/93	1410	489	1671	1.0008	436	74	7.7	1.37	1005	84	46	161.0	7.6	186	N/A	513	396	2.66
07/08/93	1310	509	N/A	N/A	657	172	N/A	1.79	1448	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

4" Steel casing 0-36' bls

* All concentrations reported in mg/l unless otherwise noted

N/A Not Analyzed

Table 2. (continued)

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond. (umhos)	Water Density (g/cm3)	CL	SO4	pH	Br	TDS	Ca	Mg	Bicarb as (CaCO3)	K	Na	Si	Fe (ug/l)	Total Hardness (CaCO3)	ION %
09/22/93	0830	509	2580	1.0012	630	187	7.7	2.40	1517	108	68	110.0	12	325	N/A	1662	545	1.47
09/22/93	1215	529	N/A	N/A	694	184	N/A	2.40	1475	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/22/93	1530	549	N/A	N/A	665	180	N/A	2.40	1450	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/23/93	0940	569	2770	1.0013	749	215	7.8	2.40	1572	114	71	107.0	13	345	N/A	97	577	1.62
09/23/93	1300	579	2790	1.0030	736	215	7.8	2.40	1584	116	73	109.0	14	357	N/A	278	590	0.48
09/27/93	1200	589	N/A	N/A	728	209	N/A	2.40	1574	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/27/93	1530	609	2890	1.0014	814	216	7.8	2.70	1685	119	74	110.0	13	367	N/A	390	602	2.3
09/28/93	0930	629	N/A	N/A	837	241	N/A	2.90	1723	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/28/93	1330	649	N/A	N/A	703	189	N/A	2.40	1594	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/28/93	1600	669	N/A	N/A	586	178	N/A	2.00	1306	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/29/93	0930	689	N/A	N/A	712	210	N/A	2.20	1556	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2. Laboratory Analyses of ROMP 5 Bailer Samples Collected During Coring*

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond. (umhos)	Water Density (g/cm3)	CL	SO4	pH	Br	TDS	Ca	Mg	Bicarb as (CaCO3)	K	Na	Si	Fe (ug/l)	Total Hardness (CaCO3)	ION %
09/29/93	1345	709	1492	1.0007	344	123	7.9	1.20	884	73	45	125.0	11	167	N/A	128	388	0.4
09/30/93	0840	729	N/A	N/A	388	152	N/A	1.40	939	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

4" Steel casing 0-480' bls

* All concentrations reported in mg/l unless otherwise noted

N/A Not Analyzed

Table 2. (continued)

Date (M/D/Y)	Time	Depth (ft bls)	Specific Cond. (umhos)	Water Density (g/cm3)	CL	SO4	pH	Br	TDS	Ca	Mg	Bicarb as (CaCO3)	K	Na	Si	Fe (ug/l)	Total Hardness (CaCO3)	ION %
10/12/93	1540	744	1343	1.0007	320	135	8.8	1.10	776	60	36	57.0	12	151	10.2	17	293	3.01
10/13/93	1620	769	N/A	N/A	518	192	N/A	1.70	1164	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/14/93	1400	789	2040	1.0010	494	186	8.0	3.70	1203	94	55	109	12.0	241	7.3	85	461	N/A
10/18/93	0745	809	N/A	N/A	555	209	N/A	1.80	1261	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/18/93	1315	829	2100	1.0010	500	179	8.1	1.7	1200	90	55	111	11.0	240	6.6	231	451	0.77
10/19/93	1610	849	N/A	N/A	534	193	N/A	2.3	1217	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/20/93	1130	869	N/A	N/A	522	198	N/A	1.5	1218	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/21/93	1015	889	2010	1.0090	471	187	8.0	1.3	1149	85	54	109	11.0	223	7.3	71	435	1.82
10/25/93	1250	909	N/A	N/A	460	168	N/A	1.60	1170	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/26/93	1400	949	N/A	1.0009	455	163	8.1	1.57	1140	84	52	110.0	11	219	N/A	376	424	0.4
10/27/93	1245	969	N/A	N/A	469	164	N/A	2.31	1198	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/27/93	1650	984	2980	1.0014	828	233	8.0	2.75	1788	115	74	101.0	12	364	N/A	363	592	3.88
11/01/93	1330	1009	2970	1.0014	797	222	7.9	2.80	1758	120	80	100.0	12	373	9.7	428	629	0.001
11/02/93	0700	1029	N/A	N/A	831	247	N/A	2.88	1847	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/02/93	1500	1049	3180	1.0015	877	242	7.8	2.90	2048	127	84	98.0	13	412	13.5	349	663	1.53
11/02/93	1720	1059	N/A	N/A	897	237	N/A	0.00	1889	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/03/93	1240	1069	3360	1.0016	918	261	8.0	3.15	2111	1.35	88	102.0	13	447	8.6	310	699	2.91
11/03/93	1740	1089	N/A	N/A	933	264	N/A	3.17	1975	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/09/93	0930	1129	3220	1.0014	883	230	7.9	0.00	1894	115	75	103.0	12	395	9.7	176	596	3.87
11/10/93	1000	1169	N/A	N/A	829	222	N/A	0.00	1874	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/15/93	1545	1209	3210	1.0015	904	242	7.9	0.00	1921	123	79	106.0	11	417	10.0	668	632	2.5
11/16/93	1530	1249	N/A	N/A	861	226	N/A	2.89	1807	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/22/93	1440	1284	3180	1.0015	841	226	7.9	3.50	1804	128	82	125.0	12	423	9.5	418	657	2.11
11/23/93	1100	1304	3320	1.0015	871	240	7.8	3.40	1886	127	N/A	123.0	13	426	10	301	651	0.37
11/23/93	1100	1304 Dup	3310	1.0015	911	243	7.9	4.00	1821	126	81	103.0	12	421	9.3	262	648	1.94

4" Steel casing 0-705' bls

R5.WB2

* All concentrations reported in mg/l unless otherwise noted

N/A Not Analyzed

Table 3. Geophysical Logs Run During Core Drilling at ROMP 5.

Logging Date	Well	Open Hole Interval (Ft bls)	Well Construction Status	Log Type
8-16-93	1st Corehole	36'-420'	Logging prior to installing 6" PVC caisng to 420'	Caliper, POR(SON), SP, GAM (NAT), RES (OHM), RES(64N, 16N), SP COND, TEMP, Lateral
8-23-93	1st Corehole	Casing to 420'	Logging after squeeze in 6" PVC casing at 370', following grouting	Caliper
11-29-93	2nd Corehole	700' -1304'	Logging at TD of corehole, 4" steel casing to 700'	Caliper, Slimline Gamma, POR(SON), SP, GAM (NAT), RES (OHM), RES(64N, 16N), SP COND, TEMP, Lateral
12-6-93	2nd Corehole	125'-1005'	Logging after plug back from 1,304'	Caliper,GAM (NAT), SP, RES (OHM), RES (64N, 16N), SP CON, TEMP, Lateral, Flow log

Crglog.wpd

Table 4. Summary of Permeameter Tests at ROMP 5.

DEPTH (Feet bls)	FORMATION	K-VALUE (ft/day)			AVERAGE K (ft/day)
		RUN 1	RUN 2	RUN 3	
546.4	NOCATEE	2.14E-04	2.16E-04	2.34E-04	2.21E-04
722.5	SUWANNEE	1.93E-04	2.04E-04	2.13-04	2.04-04
829.0	SUWANNEE	1.54E-01	2.31E-02	1.55E-01	1.38E-01\1
1022.0	OCALA	4.50E-04	5.03E-04	4.96E-04	4.83E-04
1075.0	OCALA	3.26E-04	4.35E-04	4.33E-04	3.97E-04\2
1269.0	AVON PARK	7.34E-03	7.36E-03	9.33E-03	8.01E-03

\1 Average Value of Five Runs
\2 Average Value of Four Runs

r5perm.wp6

APPENDIX A

ROMP 5 LITHOLOGIC LOG

LITHOLOGIC WELL LOG PRINTOUT SOURCE - FGS

WELL NUMBER: W-16913 COUNTY - W-16913
TOTAL DEPTH: 1650 FT. LOCATION: T.41S R.25E S.03 AA
SAMPLES - NONE LAT = 26D 56M 44S
LON = 81D 14M 29S
COMPLETION DATE: 16/11/93 ELEVATION: 40 FT
OTHER TYPES OF LOGS AVAILABLE - GAMMA, CALIPER, ELECTRIC, FLUID CONDUCTIVITY,

OWNER/DRILLER:ROMP 5 CECIL WEBB (S-2) SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT, PAT MEADORS

WORKED BY:HYDROLOGIST-- TED GATES & JOHN DECKER FROM 6-15-93 TO 11-16-93. HOLLOW STEM (LSD-35.5') WIRELINE CORE (35.5'-1304') SAMPLE QUALITY-- AVERAGE TO EXCELLENT.
DRILL CUTTINGS COLLECTED 1300'-1650', 07-19-95
** 84'-128' IS VENICE CLAY **

0.0	-	9.0	090UDSC	UNDIFFERENTIATED SAND AND CLAY
9.0	-	49.0	112CLSCR	CALOOSAHATCHEE FM.
49.0	-	84.0	122TMIM	TAMIAMI FM.
84.0	-	128.0	122PCRV	PEACE RIVER FM.
128.0	-	432.0	122PCRV	PEACE RIVER FM.
432.0	-	508.0	122ARCA	ARCADIA FM.
508.0	-	561.5	122NOCA	NOCATEE MEMBER OF ARCADIA FM.
561.5	-	711.0	122ARCA	ARCADIA FM.
711.0	-	989.0	123SWNN	SUWANNEE LIMESTONE
989.0	-	1080.4	124OCAL	OCALA GROUP
1080.4	-	T.D	124AVPK	AVON PARK FM.

0 - 4.5 SAND; BROWNISH GRAY TO MODERATE YELLOWISH BROWN
25% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-02%, SILT-10%, HEMATITE-02%
PLANT REMAINS-02%
FOSSILS: NO FOSSILS

4.5- 6 SAND; DARK GRAYISH YELLOW TO LIGHT GREENISH GRAY
20% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-07%, SILT-05%, PEAT-02%
PLANT REMAINS-02%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

6 - 9 SAND; DARK GRAYISH YELLOW TO GRAYISH ORANGE
25% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; UNCONSOLIDATED
SEDIMENTARY STRUCTURES: BEDDED
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

9 - 11.5 SAND; VERY LIGHT ORANGE TO YELLOWISH GRAY
25% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
OTHER FEATURES: CALCAREOUS
FOSSILS: MOLLUSKS
QUARTZ SAND, CLEAN AND INTERBEDDED WITH MOLLUSK FRAGMENTS.

11.5- 15 SHELL BED; WHITE TO DARK YELLOWISH ORANGE
50% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: BEDDED
OTHER FEATURES: CALCAREOUS
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS

15 - 18 SAND; WHITE TO YELLOWISH GRAY
25% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS
QUARTZ SAND, CLEAN, AND INTERBEDDED WITH MOLLUSK FRAGMENTS.

18 - 23.5 SAND; VERY LIGHT GRAY TO LIGHT OLIVE GRAY
20% POROSITY: INTERGRANULAR, MOLDIC
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; LOW SPHERICITY
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-05%, SILT-05%, CLAY-02%
OTHER FEATURES: CALCAREOUS
FOSSILS: MOLLUSKS, WORM TRACES, FOSSIL FRAGMENTS

23.5- 36 SAND; LIGHT OLIVE GRAY TO LIGHT GRAY
15% POROSITY: INTERGRANULAR, MOLDIC
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; LOW SPHERICITY
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-10%, CLAY-02%
OTHER FEATURES: CALCAREOUS
FOSSILS: CORAL, MOLLUSKS, FOSSIL FRAGMENTS
QUARTZ SAND INTERBEDDED WITH LIMESTONE RUBBLE AND NUMEROUS
SHELL FRAGMENTS.

36 - 44 CALCILUTITE; VERY LIGHT GRAY TO MODERATE LIGHT GRAY
20% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED, BIOTURBATED
ACCESSORY MINERALS: CLAY-02%, QUARTZ SAND-01%
OTHER FEATURES: PARTINGS
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, WORM TRACES
FOSSIL MOLDS

44 - 49 CALCILUTITE; YELLOWISH GRAY
20% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED, BIOTURBATED
ACCESSORY MINERALS: CLAY-02%, QUARTZ SAND-01%
OTHER FEATURES: PARTINGS
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, WORM TRACES
FOSSIL MOLDS
CALCILUTITE, FOSSILIFEROUS, MOLDIC, NUMEROUS PELECYPOD PECTIN MOLDS & CASTS, LITTLE QUARTZ SAND & CLAY, MODERATE INDURATION.

49 - 64 SAND; YELLOWISH GRAY
20% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; LOW SPHERICITY
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-05%, CALCILUTITE-10%, SILT-03%
PHOSPHATIC GRAVEL-03%
OTHER FEATURES: CALCAREOUS, POOR SAMPLE, GRANULAR
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS
QUARTZ SAND, INTERBEDDED LIMESTONE, SHELL FRAGMENTS, CLAY SILT, PHOSPHATIC SAND & GRAVEL. POOR SAMPLES.

64 - 69 PHOSPHATE; OLIVE GRAY TO BLACK
UNCONSOLIDATED
ACCESSORY MINERALS: CLAY-20%, LIMESTONE-10%, QUARTZ-03%
PHOSPHATIC SAND-10%
OTHER FEATURES: CALCAREOUS, POOR SAMPLE
FOSSILS: FOSSIL MOLDS

69 - 84 CLAY; DARK GREENISH GRAY TO DARK GREENISH GRAY
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-05%, QUARTZ SAND-03%
PHOSPHATIC GRAVEL-10%, PHOSPHATIC SAND-05%
OTHER FEATURES: POOR SAMPLE, MUDDY, VARVED
CLAY, SOFT, INTERBEDDED LIMESTONE, QUARTZ SAND, PHOSPHATE SAND & GRAVEL.

84 - 95 CLAY; GRAYISH OLIVE TO MODERATE GRAYISH GREEN
POROSITY: NOT OBSERVED; MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: DOLOMITE-01%, LIMESTONE-01%
QUARTZ SAND-01%
FOSSILS: NO FOSSILS
CLAY, DUSKY YELLOW-GREEN, IMPERMEABLE. FEW ACCESSORY MINERALS.

95 - 120.5 CLAY; GRAYISH OLIVE TO MODERATE GRAYISH GREEN
POROSITY: NOT OBSERVED; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: MASSIVE, INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-20%, PHOSPHATIC SAND-05%
LIMESTONE-01%
FOSSILS: ECHINOID, MOLLUSKS, FOSSIL FRAGMENTS
CLAY, SAND INCREASES WITH DEPTH, PHOSPHATIC SAND AND GRAVEL PRESENT, SOME INTERBEDDED LIMESTONE FRAGMENTS, ECHINOID AND MOLLUSK FOSSILS. SERVES AS CONFINING UNIT FOR SURFICIAL AQUIFER.

120.5- 128.3 CLAY; LIGHT OLIVE GRAY
03% POROSITY: INTRAGRANULAR, FRACTURE, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-35%, PHOSPHATIC GRAVEL-15%
CALCILUTITE-02%
OTHER FEATURES: CALCAREOUS
FOSSILS: FOSSIL FRAGMENTS
CLAY, QUARTZ SAND, PHOSPHATIC GRAVEL ABUNDANT, SOME LIMESTONE FRAGMENTS.

128.3- 139 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE
25% POROSITY: MOLDIC, VUGULAR, FRACTURE
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO VERY COARSE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-03%
OTHER FEATURES: GRANULAR, PARTINGS
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS
CALCARENITE, FOSSILIFEROUS, NUMEROUS MOLLUSK SHELLS, OYSTER SHELLS COMMON, INTERBEDDED QUARTZ SAND & PHOSPHATE SAND.

139 - 144 SAND; GRAYISH OLIVE
05% POROSITY: INTERGRANULAR, FRACTURE
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: PHOSPHATIC SAND-10%
PHOSPHATIC GRAVEL-03%, CLAY-02%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED
FOSSILS: FOSSIL FRAGMENTS

144 - 154 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
20% POROSITY: INTERGRANULAR, FRACTURE, VUGULAR
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED
ACCESSORY MINERALS: QUARTZ SAND-30%, PHOSPHATIC SAND-05%
LIMESTONE-02%, PHOSPHATIC GRAVEL-01%
OTHER FEATURES: POOR SAMPLE, CHALKY, PARTINGS
FOSSILS: MOLLUSKS, SHARKS TEETH, WORM TRACES
FOSSIL FRAGMENTS
CALCARENITE, POORLY CONSOLIDATED, PERMEABLE, FRACTURED INTERBEDDED.

154 - 159 SAND; LIGHT OLIVE GRAY TO GRAYISH BROWN
15% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
UNCONSOLIDATED
ACCESSORY MINERALS: CLAY-10%, PHOSPHATIC GRAVEL-05%
SILT-05%, LIMESTONE-05%
OTHER FEATURES: CALCAREOUS, SPECKLED, POOR SAMPLE
FOSSILS: FOSSIL FRAGMENTS, SHARKS TEETH
QUARTZ SAND, INTERBEDDED LIMESTONE, PHOSPHATIC GRAVEL & SAND, SHELL FRAGMENTS & CLAY, SHARKS TEETH COMMON.

159 - 164 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
20% POROSITY: FRACTURE
GRAIN TYPE: CALCILUTITE, SKELETAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BRECCIATED, NODULAR
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC GRAVEL-05%
PHOSPHATIC GRAVEL-02%
FOSSILS: FOSSIL FRAGMENTS
CALCARENITE RUBBLE, LARGE PHOSPHATE NODULES, QUARTZ SANDY.

164 - 179 CALCARENITE; DARK GRAYISH YELLOW TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, VUGULAR, MOLDIC
GRAIN TYPE: BIOGENIC, CRYSTALS, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY COARSE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-03%, PHOSPHATIC SAND-02%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS

179 - 184 LIMESTONE; YELLOWISH GRAY TO YELLOWISH GRAY
25% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO MEDIUM; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCITE-01%, QUARTZ SAND-01%
PHOSPHATIC SAND-01%
OTHER FEATURES: PLATY, PARTINGS
FOSSILS: CORAL, BENTHIC FORAMINIFERA, MOLLUSKS
FOSSIL MOLDS
LIMESTONE, FOSSILIFEROUS, NUMEROUS TURRITELLA MOLDS
PERMEABLE

184 - 189.1 CLAY; VERY LIGHT GRAY TO LIGHT OLIVE GRAY
02% POROSITY: FRACTURE, LOW PERMEABILITY
MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-02%
CALCILUTITE-02%
OTHER FEATURES: CALCAREOUS, CHALKY, PARTINGS
FOSSILS: MOLLUSKS
CLAY, LIMEY, SOME INTERBEDDED, MICRO-SIZE QUARTZ SAND
MOLLUSKS.

189.1- 199 CLAY; YELLOWISH GRAY TO YELLOWISH GRAY
03% POROSITY: FRACTURE, LOW PERMEABILITY; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-02%
CALCILUTITE-02%

199 - 205.2 LIMESTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY
20% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO COARSE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED
ACCESSORY MINERALS: CALCITE-01%, QUARTZ SAND-01%
PHOSPHATIC GRAVEL-05%
OTHER FEATURES: PLATY, PARTINGS, SPECKLED
FOSSILS: CORAL, BENTHIC FORAMINIFERA, MOLLUSKS
WORM TRACES, FOSSIL MOLDS
LIMESTONE, FOSSILIFEROUS, PERMEABLE, ABUNDANT GRANULE-SIZED
PHOSPHATE GRAVEL.

205.2- 219 CLAY; YELLOWISH GRAY TO LIGHT GREENISH GRAY
03% POROSITY: INTERGRANULAR, FRACTURE
POSSIBLY HIGH PERMEABILITY; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-02%, CALCILUTITE-05%
QUARTZ SAND-05%, PHOSPHATIC GRAVEL-10%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED
FOSSILS: FOSSIL FRAGMENTS
CLAY, QUARTZ AND PHOSPHATIC SANDY, ABUNDANT PHOSPHATE
GRAVEL, SOME VERY SMALL PHOSPHATIZED TEETH--(ALLIGATOR??)

219 - 229.2 CALCILUTITE; VERY LIGHT GRAY TO YELLOWISH GRAY
10% POROSITY
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-05%, CALCITE-01%, QUARTZ SAND-02%
PHOSPHATIC GRAVEL-05%
OTHER FEATURES: POOR SAMPLE, CHALKY, PARTINGS, SPECKLED
FOSSILS: FOSSIL MOLDS

229.2- 233.3 CLAY; YELLOWISH GRAY TO LIGHT OLIVE GRAY
03% POROSITY: INTERGRANULAR, FRACTURE; MODERATE INDURATION
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-01%, QUARTZ SAND-20%
PHOSPHATIC GRAVEL-10%, PHOSPHATIC SAND-05%
OTHER FEATURES: CALCAREOUS, GRANULAR, PARTINGS, SPECKLED
FOSSILS: FOSSIL MOLDS
CLAY, INTERBEDDED MICRO- TO COARSE- GRAINED QUARTZ SAND
PHOSPHATIC SAND & GRAVEL ABUNDANT; LOW PERMEABILITY.

233.3- 239 CLAY; DARK GREENISH GRAY TO DARK GREENISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-02%
OTHER FEATURES: LOW RECRYSTALLIZATION
FOSSILS: NO FOSSILS
CLAY, QUARTZ AND PHOSPHATE SAND PRESENT AS THIN LAMINAE
LESS INTERBEDDED.

239 - 254 CLAY; DARK GREENISH GRAY TO DARK GREENISH GRAY
10% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-02%, QUARTZ SAND-20%
PHOSPHATIC SAND-15%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS
CLAY, VERY SANDY, QUARTZ & PHOSPHATE GRAINS ARE MEDIUM
-VERY COARSE, FEW LIMESTONE MOLLUSK FRAGMENTS.

254 - 259 SAND; WHITE TO BLACK
30% POROSITY: INTERGRANULAR
GRAIN SIZE: COARSE; RANGE: MEDIUM TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: PHOSPHATIC SAND-40%
FOSSILS: NO FOSSILS
SAND-- QUARTZ AND PHOSPHATIC-- COARSE-GRAINED
UNCONSOLIDATED; PERMEABLE.

259 - 264.5 CLAY; DARK GREENISH GRAY TO DARK GREENISH GRAY
05% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-02%, QUARTZ SAND-10%
PHOSPHATIC SAND-10%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS

264.5- 267 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
05% POROSITY: INTERGRANULAR, FRACTURE
GRAIN TYPE: BIOGENIC, PELLET, CRYSTALS
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-10%
CLAY-03%
OTHER FEATURES: GRANULAR, SPECKLED

267 - 279 SAND; WHITE TO BLACK
10% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: LIMESTONE-02%, CALCILUTITE-02%
PHOSPHATIC SAND-40%
OTHER FEATURES: CALCAREOUS, SPECKLED
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS
SAND-- QUARTZ AND PHOSPHATIC, PERMEABLE, SOME MOLLUSK
FRAGMENTS.

279 - 295.7 CLAY; DARK GREENISH GRAY TO DARK GREENISH GRAY
01% POROSITY: FRACTURE; MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-01%, PHOSPHATIC SAND-01%
FOSSILS: FOSSIL MOLDS
CLAY, STIFF, IMPERMEABLE, MINOR THIN SAND LAMINAE.

295.7- 299 CALCARENITE; MODERATE LIGHT GRAY TO LIGHT OLIVE GRAY
05% POROSITY: MOLDIC, FRACTURE, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CRYSTALS, PELLET
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
MODERATE INDURATION
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: CLAY-02%, CALCITE-05%, QUARTZ SAND-03%
PHOSPHATIC SAND-03%
OTHER FEATURES: DOLOMITIC, SPECKLED
HIGH RECRYSTALLIZATION
FOSSILS: CORAL, BENTHIC FORAMINIFERA, MOLLUSKS
FOSSIL MOLDS, ECHINOID
CALCARENITE, HARD, CALCITE REPLACED FOSSILS, INTERBEDDED
CLAY, QUARTZ AND PHOSPHATIC SAND, LOW PERMEABILITY EXCEPT
IN FRACTURE ZONES.

299 - 303.8 CLAY; LIGHT OLIVE GRAY
04% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCITE-03%, CALCILUTITE-02%
QUARTZ SAND-20%, PHOSPHATIC SAND-20%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED, MUDDY
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS

303.8- 321.6 CLAY; MODERATE GRAYISH GREEN TO GREENISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCITE-03%, CALCILUTITE-02%
QUARTZ SAND-20%, PHOSPHATIC SAND-20%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS
CLAY, VERY SANDY-- QUARTZ AND PHOSPHATIC, INTERGRANULAR LOW POROSITY.

321.6- 323.8 DOLOSTONE; YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; ANHEDRAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, BIOTURBATED
ACCESSORY MINERALS: CALCITE-02%, QUARTZ SAND-05%
PHOSPHATIC SAND-03%, CLAY-03%
OTHER FEATURES: SPECKLED
FOSSILS: CORAL, BENTHIC FORAMINIFERA, MOLLUSKS
WORM TRACES
DOLOMITE, MOLDIC, FOSSILIFEROUS, MOLLUSK & WORM TUBES COMMON.

323.8- 324 SANDSTONE; LIGHT OLIVE GRAY TO GREENISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; HIGH SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-25%, PHOSPHATIC SAND-30%
LIMESTONE-05%
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS

324 - 324.6 SAND; DARK GREENISH GRAY TO GREENISH BLACK
10% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; HIGH SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX
ACCESSORY MINERALS: CLAY-20%, PHOSPHATIC SAND-30%
LIMESTONE-05%, CALCILUTITE-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS

324.6- 329.2 SAND; VERY LIGHT GRAY TO LIGHT OLIVE GRAY
10% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
ROUNDNESS: SUB-ANGULAR TO ROUNDED; HIGH SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-30%, PHOSPHATIC SAND-20%
LIMESTONE-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
FOSSIL FRAGMENTS
SAND, QUARTZ & PHOSPHATIC, CALCILUTITIC CEMENT.

329.2- 348.6 CALCARENITE; YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: CRYSTALS, PELLET, SKELTAL CAST
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-01%, SPAR-04%, QUARTZ SAND-03%
PHOSPHATIC SAND-25%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
FOSSIL FRAGMENTS, CORAL

348.6- 362 CLAY; YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-10%, SPAR-03%
QUARTZ SAND-05%, PHOSPHATIC SAND-20%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS
CLAY, LIMEY, SANDY, PHOSPHATIC, LESSER VERY FINE-GRAINED
SAND.

362 - 363 SANDSTONE; YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-02%, CALCILUTITE-10%
QUARTZ SAND-04%, PHOSPHATIC SAND-20%
OTHER FEATURES: CALCAREOUS
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
FOSSIL FRAGMENTS
SANDSTONE, PHOSPHATIC SAND IN CALCILUTITIC CEMENT, LESSER
AMOUNTS SAND & LIMESTONE FRAGMENTS.

363 - 389 CLAY; YELLOWISH GRAY
04% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-10%, QUARTZ SAND-04%
SPAR-04%, PHOSPHATIC SAND-20%
OTHER FEATURES: CALCAREOUS
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
FOSSIL FRAGMENTS

389 - 406.6 CLAY; LIGHT OLIVE GRAY TO LIGHT OLIVE GRAY
03% POROSITY: INTERGRANULAR, FRACTURE, LOW PERMEABILITY
MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: CALCILUTITE-02%, QUARTZ SAND-15%
PHOSPHATIC SAND-15%, CALCITE-01%
OTHER FEATURES: CALCAREOUS
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS
CLAY, WELL INDURATED, LOW PERMEABILITY, INTERBEDDED
FINE-GRAINED QUARTZ AND PHOSPHAITC SAND.

406.6- 407.7 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
03% POROSITY: MOLDIC, FRACTURE, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-05%, QUARTZ SAND-03%
PHOSPHATIC SAND-05%, SPAR-05%
OTHER FEATURES: PARTINGS
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS

407.7- 414 CLAY; YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-10%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%, SPAR-05%
OTHER FEATURES: CALCAREOUS, MUDDY
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS
CLAY, LIMEY, INTERBEDDED CALCILUTITE, PHOSPAHTIC SAND
QUARTZ SAND, NUMEROUS CALCILUTITE-REPLACED MOLLUSK MOLDS.

414 - 423.5 CLAY; DARK GREENISH GRAY TO DARK GREENISH GRAY
00% POROSITY: NOT OBSERVED; MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: MASSIVE, MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-01%, PHOSPHATIC SAND-01%
FOSSILS: NO FOSSILS

423.5- 424.5 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, CRYSTALS, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-02%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
FOSSIL FRAGMENTS

424.5- 425.6 CLAY; YELLOWISH GRAY TO LIGHT OLIVE GRAY
03% POROSITY: INTERGRANULAR, FRACTURE; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-20%, PHOSPHATIC SAND-05%
PHOSPHATIC GRAVEL-02%
FOSSILS: NO FOSSILS

425.6- 433 SANDSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
03% POROSITY: INTERGRANULAR, FRACTURE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE
ROUNDNESS: ANGULAR TO SUB-ANGULAR; MEDIUM SPHERICITY
POOR INDURATION
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: CLAY-05%, PHOSPHATIC SAND-03%
CALCILUTITE-04%, CHERT-01%
OTHER FEATURES: CALCAREOUS
FOSSILS: MOLLUSKS
QUARTZ SANDSTONE CEMENTED WITH CLAY & CALCILUTITE CEMENT
SOME INTERBEDDED LIMESTONE, SOME CHERT PEBBLES.

433 - 445 CALCARENITE; LIGHT OLIVE GRAY
20% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, CRYSTALS, PELLET
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-01%, QUARTZ SAND-05%
PHOSPHATIC SAND-01%, PHOSPHATIC GRAVEL-01%
OTHER FEATURES: CRYSTALLINE, FROSTED
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS
CALCARENITE, MOLDIC, PERMEABLE, SOME INTERBEDDED LIMEY
CLAY.

445 - 469 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
15% POROSITY: INTERGRANULAR, FRACTURE, MOLDIC
GRAIN TYPE: BIOGENIC, CALCILUTITE, PELLET
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-20%, QUARTZ SAND-02%
OTHER FEATURES: POOR SAMPLE
FOSSILS: MOLLUSKS, WORM TRACES
CALCARENITE, MOLDIC, FOSSILIFEROUS, INTERBEDDED LIMEY CLAY
AND NUMEROUS CLAY LENSES ALTERNATING WITH CALCARENITE
LENSES.

469 - 490.7 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, PELLET, SKELETAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-01%, QUARTZ SAND-02%
PHOSPHATIC SAND-02%
FOSSILS: MOLLUSKS

490.7- 499 DOLOSTONE; VERY LIGHT GRAY TO LIGHT OLIVE GRAY
10-50% ALTERED; ANHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; GOOD INDURATION
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: CLAY-01%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%, CALCITE-03%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

499 - 508 CALCARENITE; WHITE TO VERY LIGHT GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-02%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%, CALCITE-02%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

508 - 510.5 CLAY; WHITE TO VERY LIGHT GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-05%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%
FOSSILS: MOLLUSKS

510.5- 513.7 CALCARENITE; WHITE TO VERY LIGHT GRAY
10% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-05%, QUARTZ SAND-02%
PHOSPHATIC SAND-02%, CALCITE-01%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

513.7- 519 CLAY; WHITE TO VERY LIGHT GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-05%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%
FOSSILS: MOLLUSKS
CLAY, LIMEY, INTERBEDDED THIN LIMESTONE LENSES, INTERBEDDED
QUARTZ AND PHOSPHATE GRAINS.

519 - 553.6 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, MOLDIC, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELTAL CAST
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, MOTTLED
ACCESSORY MINERALS: CLAY-10%, CALCITE-02%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%
OTHER FEATURES: DOLOMITIC
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
CALCARENITE, FOSSILIFEROUS, MOLDIC, LOW PERMEABILITY
ALTERNATES WITH BEDS OF SANDY, LIMEY CLAY.

553.6- 555 DOLOSTONE; LIGHT GRAY TO MODERATE LIGHT GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: VERY FINE
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MOTTLED, INTERBEDDED
ACCESSORY MINERALS: CLAY-03%, QUARTZ SAND-02%
PHOSPHATIC SAND-02%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

555 - 559 CLAY; VERY LIGHT GRAY TO LIGHT GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-01%, QUARTZ SAND-02%
PHOSPHATIC SAND-02%
OTHER FEATURES: CALCAREOUS, POOR SAMPLE
FOSSILS: NO FOSSILS

559 - 560.2 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
04% POROSITY: INTERGRANULAR
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-02%, QUARTZ SAND-01%
PHOSPHATIC SAND-02%
OTHER FEATURES: POOR SAMPLE, GRANULAR, SPECKLED
FOSSILS: MOLLUSKS

560.2- 560.9 CLAY; VERY LIGHT GRAY TO LIGHT GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-01%, QUARTZ SAND-02%
PHOSPHATIC SAND-02%
OTHER FEATURES: CALCAREOUS, POOR SAMPLE
FOSSILS: NO FOSSILS

560.9- 561.4 DOLOSTONE; MODERATE LIGHT GRAY TO MODERATE GRAY
01% POROSITY: INTERGRANULAR, LOW PERMEABILITY
50-90% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BRECCIATED, MOTTLED, MASSIVE
ACCESSORY MINERALS: LIMESTONE-02%, QUARTZ SAND-10%
PHOSPHATIC SAND-10%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS
DOLOMITE, VERY FINE-GRAINED TO CRYSTALLINE, INTERBEDDED
QUARTZ AND PHOSPHATE SAND, GRADES INTO COARSER-GRAINED
MOLDIC DOLOMITE BELOW.

561.4- 573 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
20% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
50-90% ALTERED; SUBHEDRAL
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-05%, QUARTZ SAND-02%
PHOSPHATIC SAND-05%
OTHER FEATURES: GRANULAR, REEFAL
FOSSILS: CORAL, ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
VERTEBRATE
COARSE-GRAINED, MOLDIC, FOSSILIFEROUS DOLOMITE; QUARTZ &
PHOSPHATIC SAND; NUMEROUS TURITELLA AND FORAM MOLDS, AND
SOME VERTEBRATE BONE MOLDS.

573 - 579 DOLOSTONE; VERY LIGHT GRAY
03% POROSITY: FRACTURE; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: CALCILUTITE-01%, QUARTZ SAND-01%
PHOSPHATIC SAND-01%
FOSSILS: NO FOSSILS
DOLOMITE, HARD, ONLY VISIBLE POROSITY IS IN FRACTURES.

579 - 583.5 SAND; YELLOWISH GRAY TO LIGHT OLIVE GRAY
10% POROSITY: INTERGRANULAR
GRAIN SIZE: FINE; RANGE: FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-10%, PHOSPHATIC SAND-03%
IRON STAIN-01%, LIMESTONE-01%
OTHER FEATURES: CALCAREOUS
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

583.5- 589 LIMESTONE; VERY LIGHT GRAY
03% POROSITY: INTERGRANULAR, MOLDIC, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CRYSTALS, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: DOLOMITE-02%, CLAY-05%, CALCITE-01%
PHOSPHATIC SAND-03%
OTHER FEATURES: DOLOMITIC, PARTINGS
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS
LIMESTONE, MOLDIC, FRACTURED, SOME CLAY FILLED FRACTURES
LOW POROSITY.

589 - 598.5 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
20% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-03%, QUARTZ SAND-02%
PHOSPHATIC SAND-05%
OTHER FEATURES: CALCAREOUS, GRANULAR, CRYSTALLINE
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

598.5- 608 DOLOSTONE; LIGHT GRAY TO LIGHT OLIVE GRAY
15% POROSITY: FRACTURE; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: LIMESTONE-02%, QUARTZ SAND-08%
PHOSPHATIC SAND-08%, CALCITE-03%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED
FOSSILS: MOLLUSKS

608 - 613.5 DOLOSTONE; LIGHT OLIVE GRAY TO GREENISH GRAY
02% POROSITY: FRACTURE; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-10%
OTHER FEATURES: PARTINGS
FOSSILS: MOLLUSKS
HARD, CONSOLIDATED, NON-MOLDIC DOLOMITE; INCREASING SAND CONTENT.

613.5- 614 CLAY; LIGHT GRAY TO LIGHT OLIVE GRAY
02% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

614 - 618.5 CALCARENITE; WHITE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, MOLDIC
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: FINE; RANGE: FINE TO COARSE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED, INTERBEDDED
ACCESSORY MINERALS: CLAY-05%, QUARTZ SAND-01%
PHOSPHATIC SAND-03%
OTHER FEATURES: GRANULAR
FOSSILS: BENTHIC FORAMINIFERA

618.5- 619.6 CLAY; WHITE TO LIGHT GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BANDED, INTERBEDDED
ACCESSORY MINERALS: PHOSPHATIC SAND-03%
OTHER FEATURES: CALCAREOUS

619.6- 621 CALCILUTITE; VERY LIGHT ORANGE TO MODERATE GRAY
02% POROSITY: FRACTURE, LOW PERMEABILITY
GRAIN TYPE: CRYSTALS, CALCILUTITE, BIOGENIC
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: DOLOMITE-15%, QUARTZ SAND-01%
PHOSPHATIC SAND-01%
OTHER FEATURES: DOLOMITIC
FOSSILS: BENTHIC FORAMINIFERA
CALCILUTITE, HARD, MOTTLED APPEARANCE DUE TO SOLUTION CAVITIES BEING FILLED BY DARK-COLORED DOLOMITE.

621 - 624 CLAY; YELLOWISH GRAY
02% POROSITY: FRACTURE; POOR INDURATION
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-03%, PHOSPHATIC SAND-05%
LIMESTONE-03%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

624 - 629 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE
20% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-01%, PHOSPHATIC SAND-03%
OTHER FEATURES: GRANULAR, CHALKY
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

629 - 630.2 CLAY; YELLOWISH GRAY TO LIGHT GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-01%, PHOSPHATIC SAND-03%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

630.2- 639.5 DOLOSTONE; LIGHT GRAY TO LIGHT OLIVE GRAY
03% POROSITY: FRACTURE, LOW PERMEABILITY; 10-50% ALTERED
SUBHEDRAL
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): IRON CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-03%, PHOSPHATIC SAND-05%
OTHER FEATURES: GRANULAR
FOSSILS: BENTHIC FORAMINIFERA

639.5- 640.2 CLAY; LIGHT GRAY TO YELLOWISH GRAY
02% POROSITY: LOW PERMEABILITY; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX

640.2- 641.5 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-20%, QUARTZ SAND-01%
PHOSPHATIC SAND-03%
OTHER FEATURES: MUDDY
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

641.5- 644 CLAY; VERY LIGHT GRAY TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: LIMESTONE-02%, QUARTZ SAND-01%
PHOSPHATIC SAND-02%
FOSSILS: NO FOSSILS

644 - 648.5 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
08% POROSITY: INTERGRANULAR, MOLDIC
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, BANDED
ACCESSORY MINERALS: QUARTZ SAND-01%, PHOSPHATIC SAND-03%
OTHER FEATURES: SPECKLED
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

648.5- 653 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, MOLDIC, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-20%, QUARTZ SAND-01%
PHOSPHATIC SAND-04%
OTHER FEATURES: SPECKLED
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS
MOLDIC CALCARENITE; INCREASING PHOSPHATE GRAINS; CLAYEY.

653 - 654.6 SANDSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
05% POROSITY: INTERGRANULAR, FRACTURE
POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE
ACCESSORY MINERALS: PHOSPHATIC SAND-40%, LIMESTONE-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

654.6- 656.1 CLAY; YELLOWISH GRAY TO LIGHT OLIVE GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-25%, PHOSPHATIC SAND-20%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

656.1- 657.8 DOLOSTONE; LIGHT GRAY TO MODERATE LIGHT GRAY
02% POROSITY: INTERGRANULAR, FRACTURE, LOW PERMEABILITY
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-15%, PHOSPHATIC SAND-15%
OTHER FEATURES: CALCAREOUS
FOSSILS: MOLLUSKS, BENTHIC FORAMINIFERA
DOLOMITE, HARD SANDY, NON-MOLDIC, FEW FOSSILS.

657.8- 662 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, FRACTURE
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE, PELLET
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; UNCONSOLIDATED
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-10%
CLAY-10%, LIMONITE-15%
OTHER FEATURES: CALCAREOUS
FOSSILS: MOLLUSKS, BENTHIC FORAMINIFERA
CALCARENITE, UNCONSILDATED, INTERBEDDED DOLOMITE, CLAY &
QUARTZ & PHOSPHATIC SAND GRAINS.

662 - 669 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: CLAY-05%, QUARTZ SAND-02%
PHOSPHATIC SAND-03%
OTHER FEATURES: GRANULAR
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

669 - 671 DOLOSTONE; LIGHT OLIVE GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: LIMESTONE-04%, QUARTZ SAND-20%
PHOSPHATIC SAND-25%
OTHER FEATURES: CALCAREOUS, GRANULAR, SPECKLED, WEATHERED
FOSSILS: MOLLUSKS, ECHINOID

671 - 674.4 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
03% POROSITY: FRACTURE, MOLDIC; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-20%, PHOSPHATIC SAND-20%
CALCITE-03%
OTHER FEATURES: CALCAREOUS, SPECKLED
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS
DOLOMITE, VERY SANDY, SLIGHTLY MOLDIC, FEW CALCITE FOSSILS.

674.4- 675.2 CLAY; WHITE TO YELLOWISH GRAY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
ACCESSORY MINERALS: LIMESTONE-15%, QUARTZ SAND-03%
PHOSPHATIC SAND-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

675.2- 679 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: BIOGENIC, SKELETAL, PELLET
GRAIN SIZE: COARSE; RANGE: MEDIUM TO COARSE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-03%, PHOSPHATIC SAND-05%
FOSSILS: MOLLUSKS, BENTHIC FORAMINIFERA

679 - 681.2 CALCILUTITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: CALCILUTITE, BIOGENIC
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-15%
CLAY-02%
OTHER FEATURES: GRANULAR
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

681.2- 684 CALCARENITE; WHITE TO YELLOWISH GRAY
08% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: BIOGENIC, PELLET, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-15%
CLAY-02%
OTHER FEATURES: GRANULAR
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, ECHINOID

684 - 685.3 CALCILUTITE; WHITE TO LIGHT OLIVE GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, PELLET
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-15%
OTHER FEATURES: GRANULAR, WEATHERED
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

685.3- 688 CLAY; LIGHT GRAY TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-02%
FOSSILS: NO FOSSILS

688 - 690 DOLOSTONE; LIGHT GRAY TO MODERATE LIGHT GRAY
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-02%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

690 - 693 CALCILUTITE; MODERATE LIGHT GRAY TO YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: CALCILUTITE, BIOGENIC
GRAIN SIZE: FINE; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-03%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

693 - 702.8 CLAY; LIGHT OLIVE GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-02%
FOSSILS: NO FOSSILS

702.8- 711.6 DOLOSTONE; YELLOWISH GRAY TO MODERATE DARK GRAY
02% POROSITY: FRACTURE; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BANDED, MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-03%, PHOSPHATIC SAND-02%
FOSSILS: MOLLUSKS, BENTHIC FORAMINIFERA
DOLOMITE, BRECCIATED, FOSSILIFEROUS, MOLDIC, FRACTURED
BELOW 706'.

711.6- 729 CALCARENITE; WHITE TO YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, FRACTURE
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: CRYSTALS
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
ACCESSORY MINERALS: CLAY-05%, QUARTZ SAND-05%
OTHER FEATURES: CHALKY
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

729 - 731 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
08% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: SILT-02%
OTHER FEATURES: CHALKY
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS

731 - 731.7 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-25%
OTHER FEATURES: CALCAREOUS
FOSSILS: BENTHIC FORAMINIFERA

731.7- 734 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
08% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: SILT-02%
OTHER FEATURES: CHALKY
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS

734 - 734.6 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-25%
OTHER FEATURES: CALCAREOUS
FOSSILS: BENTHIC FORAMINIFERA

734.6- 738.9 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-03%, CLAY-01%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

738.9- 739 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY, POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-25%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

739 - 740 CALCARENITE; VERY LIGHT ORANGE
03% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS

740 - 742.2 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-30%
OTHER FEATURES: CALCAREOUS

742.2- 744.8 CALCARENITE; VERY LIGHT ORANGE TO VERY LIGHT GRAY
03% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-03%, PHOSPHATIC SAND-01%
OTHER FEATURES: MEDIUM RECRYSTALLIZATION
FOSSILS: BENTHIC FORAMINIFERA

744.8- 745.5 CLAY; LIGHT OLIVE GRAY TO GREENISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-05%, QUARTZ SAND-20%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

745.5- 749 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: FINE; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-15%, CALCARENITE-01%
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID

749 - 745 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-15%, PHOSPHATIC SAND-01%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

745 - 767 CALCARENITE; VERY LIGHT ORANGE TO VERY LIGHT GRAY
10% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-20%, LIMESTONE-03%
PEAT-01%
FOSSILS: BENTHIC FORAMINIFERA, ECHINOID

767 - 769 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-15%, CALCILUTITE-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

769 - 779 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, MOLDIC
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-15%, CALCILUTITE-05%
OTHER FEATURES: POOR SAMPLE
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS
CALCARENITE, QUARTZ SANDY, NUMEROUS LENSES OF QUARTZ SAND.

779 - 789 SAND; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO COARSE
ROUNDNESS: ANGULAR TO SUB-ANGULAR; MEDIUM SPHERICITY
UNCONSOLIDATED
SEDIMENTARY STRUCTURES: BEDDED
FOSSILS: NO FOSSILS

789 - 794 SANDSTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO COARSE
ROUNDNESS: ANGULAR TO SUB-ANGULAR; MEDIUM SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: CALCILUTITE-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

794 - 795.3 SAND; LIGHT GREENISH GRAY
10% POROSITY: INTERGRANULAR
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM
ROUNDNESS: ANGULAR TO SUB-ANGULAR; MEDIUM SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-30%, CALCILUTITE-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

795.3- 801.1 CLAY; LIGHT GREENISH GRAY
05% POROSITY: INTERGRANULAR; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-30%, CALCILUTITE-05%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

801.1- 804 CALCARENITE; WHITE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO FINE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-05%, QUARTZ SAND-05%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

804 - 814 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
ACCESSORY MINERALS: CLAY-15%, QUARTZ SAND-03%
OTHER FEATURES: MUDDY
FOSSILS: MOLLUSKS, BENTHIC FORAMINIFERA

814 - 819.7 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-02%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

819.7- 824 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-20%
FOSSILS: FOSSIL FRAGMENTS

824 - 829.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-01%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, ECHINOID

829.5- 833.4 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-10%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, ECHINOID
CALCARENITE, INCREASING QUARTZ CONTENT.

833.4- 843.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-10%
FOSSILS: FOSSIL FRAGMENTS

843.5- 850.2 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
ACCESSORY MINERALS: CLAY-30%, QUARTZ SAND-01%
IRON STAIN-01%
FOSSILS: FOSSIL FRAGMENTS
CALCILUTITE, CLAYEY, LARGE IRON-STAINED CALCILUTITE NODULES
PRESENT AT 844.4'.

850.2- 857.2 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, FRACTURE, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
MODERATE INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
ACCESSORY MINERALS: QUARTZ SAND-01%
FOSSILS: FOSSIL FRAGMENTS

857.2- 858.5 DOLOSTONE; GRAYISH BROWN TO YELLOWISH GRAY
02% POROSITY: LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: QUARTZ SAND-05%, CALCILUTITE-10%
OTHER FEATURES: CALCAREOUS
FOSSILS: FOSSIL FRAGMENTS

858.5- 866 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, FRACTURE, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO FINE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-01%
FOSSILS: FOSSIL FRAGMENTS

866 - 870.8 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
ACCESSORY MINERALS: QUARTZ SAND-01%, CLAY-05%
FOSSILS: PLANKTONIC FORAMINIFERA, FOSSIL FRAGMENTS
CALCARENITE, CLAYEY, SOME ORGANICS PRESENT.

870.8- 873.8 SANDSTONE; VERY LIGHT ORANGE TO GRAYISH ORANGE
15% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: CLAY-01%
FOSSILS: NO FOSSILS

873.8- 889 SAND; GRAYISH ORANGE TO LIGHT OLIVE GRAY
15% POROSITY: INTERGRANULAR, POSSIBLY HIGH PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: CLAY-03%
FOSSILS: NO FOSSILS

889 - 899 CALCILUTITE; VERY LIGHT GRAY TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED, INTERBEDDED
ACCESSORY MINERALS: CLAY-10%
FOSSILS: NO FOSSILS

899 - 900.1 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: CALCILUTITE-02%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

900.1- 909 CALCILUTITE; VERY LIGHT GRAY TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-10%
FOSSILS: NO FOSSILS

909 - 912.3 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL
GRAIN SIZE: FINE; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: QUARTZ SAND-01%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

912.3- 922.5 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-40%
FOSSILS: FOSSIL FRAGMENTS

922.5- 928.1 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL
GRAIN SIZE: FINE; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: QUARTZ SAND-01%, CLAY-03%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

928.1- 937 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-40%
FOSSILS: FOSSIL FRAGMENTS

937 - 956 CALCILUTITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, FRACTURE
GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: CLAY-20%, IRON STAIN-01%, CALCITE-05%
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS
CALCILUTITE, CLAYEY, SOME LENSES OF CALCARENITE, SOME IRON STAINS PRESENT IN FRACTURE ZONES, SOME MOTTLING.

956 - 971.6 CALCILUTITE; WHITE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: CALCITE-05%, QUARTZ SAND-02%
OTHER FEATURES: CHALKY
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS

971.6- 973.4 CALCILUTITE; YELLOWISH GRAY TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, FRACTURE
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-20%, PLANT REMAINS-01%
OTHER FEATURES: WEATHERED
FOSSILS: ALGAE
CALCILUTITE, SOFT, CLAYEY, WEATHERED, GREEN ALGAE CASTS.

973.4- 972.9 CALCILUTITE; DARK YELLOWISH BROWN TO DARK YELLOWISH BROWN
02% POROSITY: INTERGRANULAR, FRACTURE
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED
FOSSILS: NO FOSSILS
CACILUTITE, DARK BROWN, WEATHERED.

972.9- 979.5 CALCILUTITE; VERY LIGHT GRAY TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
ACCESSORY MINERALS: CLAY-30%
OTHER FEATURES: WEATHERED
FOSSILS: NO FOSSILS

979.5- 980 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: DOLOMITIC
FOSSILS: MOLLUSKS

980 - 988 DOLOSTONE; LIGHT OLIVE GRAY TO YELLOWISH GRAY
05% POROSITY: FRACTURE; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: QUARTZ SAND-03%
FOSSILS: NO FOSSILS

988 - 994 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-10%, QUARTZ SAND-03%
CALCILUTITE-05%
OTHER FEATURES: WEATHERED
FOSSILS: BENTHIC FORAMINIFERA

994 - 1001 CALCILUTITE; WHITE TO YELLOWISH GRAY
04% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: CALCILUTITE, BIOGENIC
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MOTTLED, INTERBEDDED
ACCESSORY MINERALS: CHERT-01%, CLAY-01%
OTHER FEATURES: FROSTED
SOFT CALCILUTITE; MANY FORAMINIFERA, E.G., NUMMULITES; SOME
INTERBEDDED CLAY & CHERT AND RIP-UP CLASTS AT 996.5'.

1001 - 1037.4 CALCARENITE; WHITE TO YELLOWISH GRAY
04% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-01%, CLAY-01%
OTHER FEATURES: CHALKY
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

1037.4- 1046 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: VUGULAR, POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: GRANULAR, REEFAL
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
WORM TRACES
CALCARENITE, FOSSILIFEROUS, MANY MOLLUSKS AND FORAMS.

1046 - 1049.2 CALCARENITE; WHITE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: CLAY-05%
OTHER FEATURES: CHALKY
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS

1049.2- 1050.7 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, PIN POINT VUGS
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-02%
OTHER FEATURES: GRANULAR
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, ECHINOID
FOSSIL FRAGMENTS

1050.7- 1060 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS, CALCILUTITE
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-01%
FOSSILS: NO FOSSILS

1060 - 1068.6 DOLOSTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY
10% POROSITY: FRACTURE, POSSIBLY HIGH PERMEABILITY
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: CRYPTOCRYSTALLINE TO FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
FOSSILS: NO FOSSILS
DOLOMITE, HARD, SOME FRACTURE ZONES, FINE GRAIN-SIZED
DOLOMITE CRYSTALS PRESENT IN THESE ZONES.

1068.6- 1070 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
MODERATE INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: CHALKY
FOSSILS: NO FOSSILS

1070 - 1071.4 DOLOSTONE; MODERATE YELLOWISH BROWN TO VERY LIGHT GRAY
10% POROSITY: FRACTURE, MOLDIC; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
OTHER FEATURES: MEDIUM RECRYSTALLIZATION
HARD DOLOMITE; RECRYSTALLIZATION PRESENT IN FRACTURES &
VUGS.

1071.4- 1080.4 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED
ACCESSORY MINERALS: QUARTZ SAND-01%
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1080.4- 1085.5 DOLOSTONE; LIGHT GRAY TO LIGHT OLIVE GRAY
15% POROSITY: FRACTURE, MOLDIC, VUGULAR; 50-90% ALTERED
SUBHEDRAL
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: PLANT REMAINS-02%, CALCILUTITE-02%
FOSSILS: ECHINOID, FOSSIL MOLDS
VUGULAR, FRACTURED DOLOMITE; ORGANICS AT 1082.6'.

1085.5- 1086 CLAY; LIGHT OLIVE GRAY TO OLIVE GRAY
01% POROSITY: LOW PERMEABILITY; MODERATE INDURATION
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT
ACCESSORY MINERALS: DOLOMITE-02%
OTHER FEATURES: DOLOMITIC
FOSSILS: NO FOSSILS

1086 - 1095.1 DOLOSTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: FRACTURE, POSSIBLY HIGH PERMEABILITY
50-90% ALTERED; SUBHEDRAL
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-02%
FOSSILS: NO FOSSILS
DOLOMITE, CRYSTALLINE, FRACTURED.

1095.1- 1096.2 DOLOSTONE; OLIVE GRAY TO DARK GREENISH GRAY
01% POROSITY: INTERGRANULAR, FRACTURE
POSSIBLY HIGH PERMEABILITY
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE
SEDIMENTARY STRUCTURES: FISSILE, MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: WEATHERED, GREASY
FOSSILS: NO FOSSILS
DOLOMITE, VERY SOFT, WEATHERED, MOTTLED.

1096.2- 1097.3 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
03% POROSITY: FRACTURE, LOW PERMEABILITY; 50-90% ALTERED
SUBHEDRAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-02%
OTHER FEATURES: FROSTED, GRANULAR
FOSSILS: NO FOSSILS

1097.3- 1099.5 DOLOSTONE; VERY LIGHT ORANGE TO YELLOWISH GRAY
03% POROSITY: FRACTURE, LOW PERMEABILITY; 50-90% ALTERED
SUBHEDRAL
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX
SEDIMENTARY STRUCTURES: BRECCIATED, MOTTLED, MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-02%, CLAY-02%, PYRITE-01%
OTHER FEATURES: CALCAREOUS, WEATHERED
FOSSILS: NO FOSSILS

1099.5- 1105.7 DOLOSTONE; LIGHT OLIVE GRAY TO OLIVE GRAY
02% POROSITY: FRACTURE, LOW PERMEABILITY; 90-100% ALTERED
ANHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: FISSILE, MASSIVE
ACCESSORY MINERALS: CLAY-02%
OTHER FEATURES: WEATHERED
FOSSILS: NO FOSSILS
DOLOMITE, VERY SOFT, WAXY.

1105.7- 1109 DOLOSTONE; YELLOWISH GRAY
01% POROSITY: LOW PERMEABILITY; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
OTHER FEATURES: CHALKY
FOSSILS: BENTHIC FORAMINIFERA

1109 - 1109.7 DOLOSTONE; MODERATE YELLOWISH BROWN
05% POROSITY: FRACTURE, LOW PERMEABILITY; 50-90% ALTERED
ANHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: FISSILE, LAMINATED
OTHER FEATURES: PLATY, WEATHERED
FOSSILS: NO FOSSILS
DOLOMITE, SOFT, WAXY, VERY WEATHERED.

1109.7- 1110.9 DOLOSTONE; MODERATE YELLOWISH BROWN TO GRAYISH BROWN
01% POROSITY: INTERGRANULAR, LOW PERMEABILITY
50-90% ALTERED; ANHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MOTTLED
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: WEATHERED
FOSSILS: NO FOSSILS

1110.9- 1114 DOLOSTONE; MODERATE LIGHT GRAY TO BLACK
01% POROSITY: LOW PERMEABILITY; 50-90% ALTERED; ANHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, ORGANIC MATRIX
SEDIMENTARY STRUCTURES: LAMINATED, FISSILE
ACCESSORY MINERALS: PLANT REMAINS-03%
OTHER FEATURES: CALCAREOUS, WEATHERED
FOSSILS: ORGANICS
SOFT, VERY WEATHERED DOLOMITE; THIN LAMINAE OF ORGANICS.

1114 - 1119.2 CALCARENITE; VERY LIGHT ORANGE
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: GRANULAR
FOSSILS: BENTHIC FORAMINIFERA

1119.2- 1128 CALCARENITE; VERY LIGHT ORANGE
15% POROSITY: MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1128 - 1151 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, PELLET, SKELTAL CAST
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-01%
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
ORGANICS

1151 - 1154 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, PELLET, SKELTAL CAST
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-02%
OTHER FEATURES: GRANULAR, REEFAL
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1154 - 1164 CALCARENITE; VERY LIGHT ORANGE
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS, PELLET
GRAIN SIZE: FINE; RANGE: FINE TO COARSE; GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: DOLOMITE-01%, QUARTZ SAND-01%
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1164 - 1165.2 CALCARENITE; VERY LIGHT ORANGE TO LIGHT GRAY
10% POROSITY: INTERGRANULAR, MOLDIC, FRACTURE
GRAIN TYPE: BIOGENIC, PELLET
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED
ACCESSORY MINERALS: DOLOMITE-05%, QUARTZ SAND-01%
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION
GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
CALCARENITE, RECRYSTALLIZED DOLOMITE IN CAVITIES AND IN
FOSSIL MOLDS.

1165.2- 1169 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-20%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

1169 - 1179.9 CALCARENITE; VERY LIGHT ORANGE TO LIGHT GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, PELLET, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED, MOTTLED, MASSIVE
ACCESSORY MINERALS: DOLOMITE-05%, QUARTZ SAND-01%
QUARTZ-02%
OTHER FEATURES: DOLOMITIC
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1179.9- 1183 CLAY; VERY LIGHT ORANGE TO GRAYISH BROWN
02% POROSITY: FRACTURE, LOW PERMEABILITY; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-20%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

1183 - 1189.4 CALCARENITE; GRAYISH BROWN TO LIGHT OLIVE GRAY
10% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, PELLET, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: DOLOMITE-01%, QUARTZ SAND-01%
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA

1189.4- 1193.7 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: LOW PERMEABILITY; POOR INDURATION
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

1193.7- 1203 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, MOLDIC, FRACTURE
GRAIN TYPE: BIOGENIC, CRYSTALS, PELLET
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-02%
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1203 - 1209 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: QUARTZ SAND-02%
FOSSILS: BENTHIC FORAMINIFERA

1209 - 1209.4 CLAY; VERY LIGHT ORANGE TO YELLOWISH GRAY
02% POROSITY: INTERGRANULAR, LOW PERMEABILITY
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-20%, QUARTZ SAND-01%
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS

1209.4- 1223.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-02%
OTHER FEATURES: CHALKY
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA
CALCARENITE, FINE-GRAINED, SOME WEATHERED FORAMS AND ECHINOID CASTS.

1223.5- 1235 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
15% POROSITY: INTERGRANULAR, MOLDIC, VUGULAR
GRAIN TYPE: BIOGENIC, PELLET, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-02%
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1235 - 1258 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
08% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, PELLET, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-01%
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA

1258 - 1258 CALCARENITE; YELLOWISH GRAY TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: DOLOMITE-02%
OTHER FEATURES: DOLOMITIC, GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS
ORGANICS

1258 - 1273.5 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
08% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, PELLET, SKELETAL
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
OTHER FEATURES: GRANULAR
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, MOLLUSKS

1273.5- 1281.6 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, CRYSTALS, PELLET
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, MASSIVE
ACCESSORY MINERALS: PLANT REMAINS-10%, DOLOMITE- %
OTHER FEATURES: GRANULAR, LOW RECRYSTALLIZATION
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS, FOSSIL FRAGMENTS
MOLLUSKS
CALCARENITE, GRANULAR, INTERBEDDED ORGANICS, CALCIFIED
FOSSILS, SOME VERTICAL FRACTURE TRACES, SLIGHTLY DOLOMITIC
SOME LAMINATION FEATURES-- DARK GREEN GLAUCONITE PELLETS?
OR ORGANICS.

1281.6- 1282 CALCARENITE; YELLOWISH GRAY
07% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE
ACCESSORY MINERALS: PLANT REMAINS- %
OTHER FEATURES: LOW RECRYSTALLIZATION, CALCAREOUS
GRANULAR
FOSSILS: BENTHIC FORAMINIFERA, ORGANICS, FOSSIL FRAGMENTS

1282 - 1283.6 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE
07% POROSITY: INTERGRANULAR, PIN POINT VUGS, FRACTURE
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: PLANT REMAINS- %
OTHER FEATURES: GRANULAR, LOW RECRYSTALLIZATION
FOSSILS: ORGANICS, FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA
INFILLED FRACTURE TRACES, GLAUCONITE? OR ORGANICS.

1283.6- 1284 CALCARENITE; YELLOWISH GRAY
07% POROSITY: INTERGRANULAR, LOW PERMEABILITY
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED, MASSIVE
OTHER FEATURES: GRANULAR, LOW RECRYSTALLIZATION
FOSSILS: FOSSIL FRAGMENTS

1284 - 1299.1 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE
07% POROSITY: INTERGRANULAR, LOW PERMEABILITY, FRACTURE
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO COARSE
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED, MASSIVE
ACCESSORY MINERALS: DOLOMITE- %, CALCITE- %
QUARTZ SAND- %
OTHER FEATURES: GRANULAR, LOW RECRYSTALLIZATION
FOSSILS: FOSSIL FRAGMENTS, ORGANICS, BENTHIC FORAMINIFERA
MOLLUSKS
SOME MOLLUSK FRAGMENTS & MOLDS, CHLORITE? OR ORGANICS
FRACTURE TRACES- SOME INFILLED, SLIGHTLY MORE
RECRYSTALLIZED.

1299.1- 1299.2 CALCILUTITE; YELLOWISH GRAY
POROSITY: INTERGRANULAR
GRAIN TYPE: CALCILUTITE
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE
POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
OTHER FEATURES: CALCAREOUS
FOSSILS: NO FOSSILS
CLAYEY CALCILUTITE.

1299.2- 1304 CALCARENITE; YELLOWISH GRAY
POROSITY: INTERGRANULAR
GRAIN TYPE: BIOGENIC, CALCILUTITE
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM
GOOD INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: BEDDED, MASSIVE
OTHER FEATURES: GRANULAR, LOW RECRYSTALLIZATION
FOSSILS: FOSSIL FRAGMENTS, ORGANICS
WHITE CHALKY FOSSILS & FOSSIL FRAGMENTS; ALTERED
RECRYSTALLIZED MOLLUSK SHELL FRAGMENTS; FRACTURE TRACE AT
BASE OF SECTION.

1304 - 1341 CALCARENITE; VERY LIGHT GRAY TO YELLOWISH GRAY
05% POROSITY: INTERGRANULAR
GRAIN TYPE: BIOGENIC
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX

1341 - 1360 DOLOSTONE; MODERATE LIGHT GRAY TO LIGHT OLIVE GRAY
05% POROSITY: FRACTURE; 10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE
GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: MASSIVE
OTHER FEATURES: CALCAREOUS, WEATHERED
HARD DOLOSTONE, POSSIBLY FRACTURED, SOME SULFATE STAINING.

1360 - 1395 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: BIOGENIC, PELLET
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: DOLOMITE-20%, MICA-01%

1395 - 1407 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
10% POROSITY: FRACTURE, POSSIBLY HIGH PERMEABILITY
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: CALCARENITE-03%
OTHER FEATURES: CRYSTALLINE
HARD DOLOSTONE, FRACTURED, SOME INTERBEDDED CALCARENITE
HIGHLY PERMEABLE.

1407 - 1437 CALCARENITE; WHITE TO YELLOWISH GRAY
10% POROSITY: INTERGRANULAR, MOLDIC, PIN POINT VUGS
GRAIN TYPE: BIOGENIC, SKELETAL, SKELTAL CAST
GRAIN SIZE: VERY FINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: DOLOMITE-02%
OTHER FEATURES: MUDDY, WEATHERED, FOSSILIFEROUS
FOSSILS: PLANKTONIC FORAMINIFERA

1437 - 1467 CALCARENITE; WHITE TO YELLOWISH GRAY
15% POROSITY: INTRAGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: PELLET, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
ACCESSORY MINERALS: DOLOMITE-02%
OTHER FEATURES: CHALKY, FOSSILIFEROUS
FOSSILS: PLANKTONIC FORAMINIFERA
LIMESTONE, FOSSILIFEROUS, COMPOSED OF NUMMULITES - PROBABLY
FALL IN FROM OCALA LM ABOVE.

1467 - 1507 CALCARENITE; YELLOWISH GRAY TO OLIVE GRAY
10% POROSITY: INTRAGRANULAR, POSSIBLY HIGH PERMEABILITY
FRACTURE
GRAIN TYPE: PELLET, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: DOLOMITE-02%
OTHER FEATURES: CHALKY, FOSSILIFEROUS
FOSSILS: PLANKTONIC FORAMINIFERA

1507 - 1527 CALCARENITE; YELLOWISH GRAY TO OLIVE GRAY
10% POROSITY: INTRAGRANULAR, POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: PELLET, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: DOLOMITE-03%, CALCITE-01%
OTHER FEATURES: CHALKY, FOSSILIFEROUS, VARIEGATED
FOSSILS: PLANKTONIC FORAMINIFERA
LIMESTONE, FOSSILIFEROUS, DOLOMITE CONTENT INCREASING.

1527 - 1537 DOLOSTONE; DARK GRAYISH YELLOW TO OLIVE GRAY
10% POROSITY: INTERGRANULAR, PIN POINT VUGS
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CALCILUTITE-02%
OTHER FEATURES: CALCAREOUS

1537 - 1547 CALCARENITE; VERY LIGHT ORANGE TO GRAYISH BROWN
10% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: PELLET, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: DOLOMITE-01%, CALCITE-01%, CLAY-01%
OTHER FEATURES: FOSSILIFEROUS
FOSSILS: PLANKTONIC FORAMINIFERA

1547 - 1557 CALCARENITE; VERY LIGHT ORANGE TO GRAYISH BROWN
10% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: PELLET, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: CLAY-05%, DOLOMITE-01%
OTHER FEATURES: FOSSILIFEROUS
FOSSILS: PLANKTONIC FORAMINIFERA

1557 - 1580 CALCARENITE; VERY LIGHT ORANGE TO GRAYISH BROWN
10% POROSITY: INTERGRANULAR, MOLDIC
POSSIBLY HIGH PERMEABILITY
GRAIN TYPE: PELLET, SKELETAL, SKELTAL CAST
GRAIN SIZE: MICROCRYSTALLINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX
DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: INTERBEDDED
ACCESSORY MINERALS: DOLOMITE-30%, CLAY-02%
FOSSILS: PLANKTONIC FORAMINIFERA
LIMESTONE, NMEROUS FOAMS, NUMMULITES - FALL IN FROM ABOVE.

1580 - 1600 DOLOSTONE; WHITE TO LIGHT OLIVE GRAY
10% POROSITY: INTRAGRANULAR, INTERCRYSTALLINE
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: VERY FINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-20%
OTHER FEATURES: CRYSTALLINE
FOSSILS: PLANKTONIC FORAMINIFERA

1600 - 1620 DOLOSTONE; WHITE TO LIGHT OLIVE GRAY
10% POROSITY: INTRAGRANULAR, INTERCRYSTALLINE
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: VERY FINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-05%
OTHER FEATURES: CRYSTALLINE
FOSSILS: PLANKTONIC FORAMINIFERA

1620 - 1630 DOLOSTONE; WHITE TO LIGHT OLIVE GRAY
10% POROSITY: INTRAGRANULAR, INTERCRYSTALLINE
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: VERY FINE
RANGE: MICROCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT, CALCILUTITE MATRIX
ACCESSORY MINERALS: CALCILUTITE-20%
OTHER FEATURES: CRYSTALLINE
FOSSILS: PLANKTONIC FORAMINIFERA
DOLOMITE, INCLUDES LIMESTONE FRAGMENTS & NUMMULITES CASTS FALL IN FROM ABOVE.

1630 - 1640 DOLOSTONE; LIGHT OLIVE GRAY TO LIGHT OLIVE GRAY
05% POROSITY: INTERGRANULAR, INTERCRYSTALLINE, FRACTURE
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: CRYPTOCRYSTALLINE TO VERY FINE; POOR INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
ACCESSORY MINERALS: CALCILUTITE-03%
FOSSILS: VERTEBRATE
DOLOSTONE, DECREASING CALCILUTITE.

1640 - 1650 DOLOSTONE; YELLOWISH GRAY TO LIGHT OLIVE GRAY
15% POROSITY: INTERGRANULAR, INTERCRYSTALLINE, FRACTURE
10-50% ALTERED; SUBHEDRAL
GRAIN SIZE: MICROCRYSTALLINE
RANGE: CRYPTOCRYSTALLINE TO VERY FINE; GOOD INDURATION
CEMENT TYPE(S): DOLOMITE CEMENT
SEDIMENTARY STRUCTURES: MASSIVE
ACCESSORY MINERALS: CALCILUTITE-01%
OTHER FEATURES: FOSSILIFEROUS
FOSSILS: ECHINOID
DOLOSTONE, HARD, FRACTURED, CRYSTALLINE, ECHINOID MOLDS PRESENT.

1650 TOTAL DEPTH

APPENDIX B

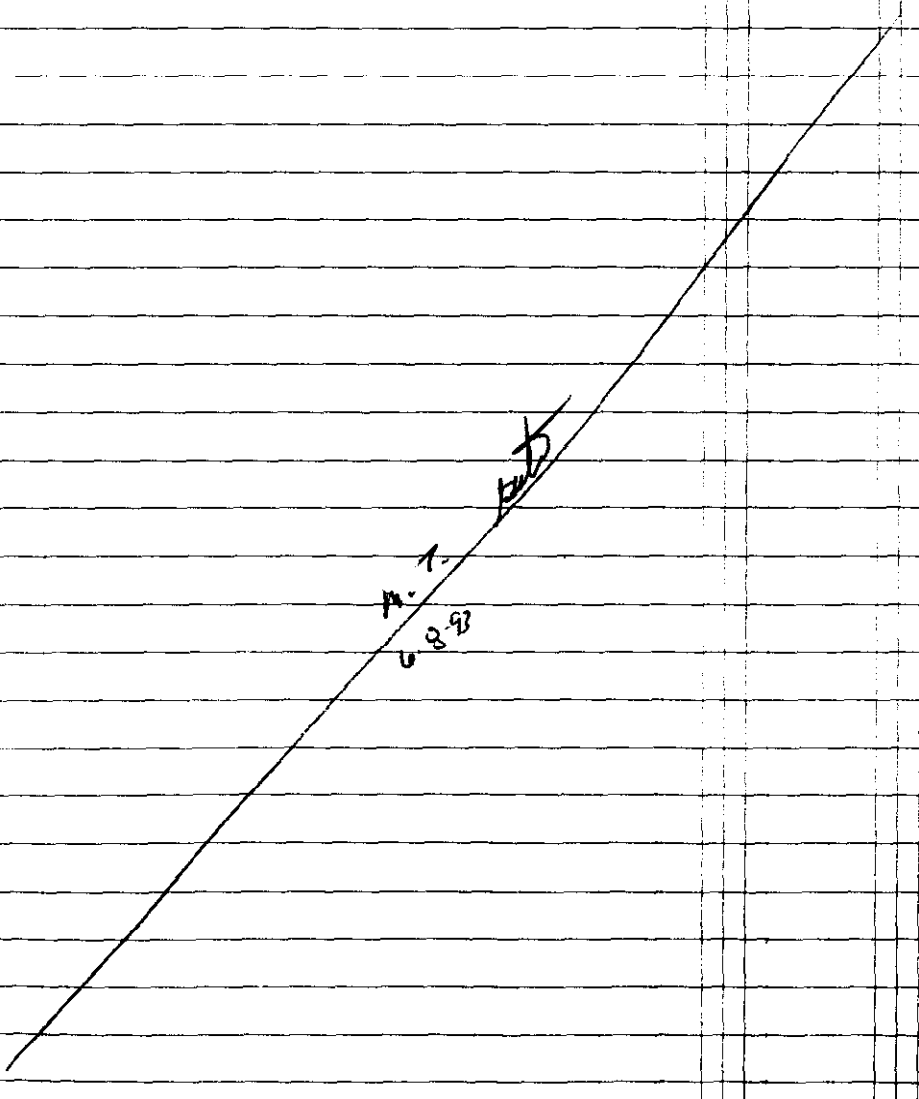
GEOLOGIST'S DAILY LOGS

Comp 5 / Cecil Webb / Charlotte Co.

T. Gates
TUESDAY 6-8-93

1700 T. Gates arrives on-site @ Cecil Webb. P. Meadors, J. Schiedemantz on-site drilling. Currently @ 13' bls, they have split spoonal to this depth. In the unconsolidated Surficials sands. Mostly Qtz. Sand + shell.

1730 Securing site - leaving site for day. ——



RAMP 5 / Cecil Webb / CHARLOTTE Co. T. GATES
WEDNESDAY 6-9-88

0710 T. Gates on-site. P. Meadors, J. Schickendanz already on-site.
WEATHER: Clear, Sunny, Temp ~78°, high today 96°F, no chance of rain.

0800 Collect spoon @ 13-17', Qtz sand, silt & interbedded shell, Also clean shell beds of broken mollusk shells - very permeable.

0900 - Dave Fanchor & Bob ~~on-site~~ Mechanics from Brooksville office, on-site to service rig. Currently using mud pan for circulating water & cuttings. WATER LEVEL ~ 2' bls. Water is extremely muddy & thick will wait to collect water sample.

1200 NOTE: SHELL BED present in split spoon samples appears to not be in place in core boxes. SHELL was present @ the top of the 3 spoon intervals: 13-15; 15-17; 17-19. A ~~previous~~ site cored by the FGS approx 2 miles away had a shell bed present @ 16-18' bls. The 19-21' interval was ~~per~~ recovered due to large piece of fossiliferous limestone that blocked spoon.

1230 T. Gates leaving site to purchase D.I H_2O.

1310 T. Gates back on site. Currently @ 25.5' bls
NOTE: Mechanics off site @ 1200.

1615 Reach hard limestone bed @ ~~@~~ 35.5' bls. This zone was reached @ 32.5' bls @ FGS site ~2 miles away (Thickness: 8-9').

1630 Call Brooksville - speak to John Decker about this well - will either abandon or set a water supply well here because this is not in permanent use.

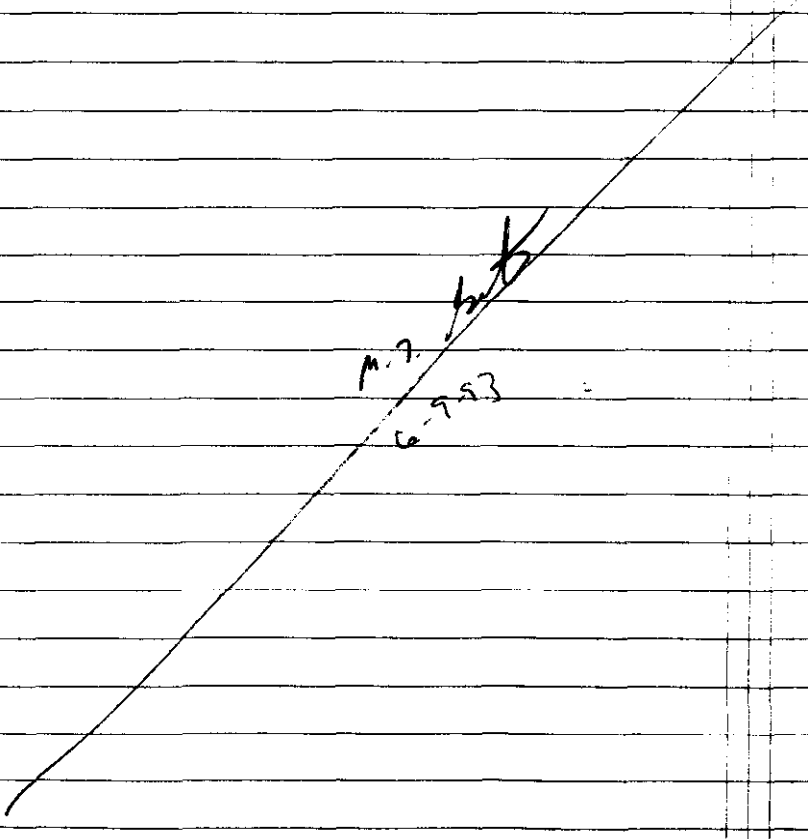
1645 Decide to abandon this hole in favor of moving the core rig closer to the mud pit.

RAMPS Cecil Webb / Charlotte G. — T GATES
WEDNESDAY 6-9-93

1700 Will install a water supply well into the Intermediate aquifer tomorrow due to poor water in surficial for mixing mud. Collect water sample from borehole for surficial water sample. Collected from discharge line of while pumping from borehole after inserting intake line in borehole - water very silty.

1700 Depth: 20' bls. Temp: 27.0°C pH: 7.26
Conduct. 1391 uMHOS.

1740 T Gates leaving site for day - drillers offsite



ROMPS Cecil Webb / Charlotte Co. T. Gates

THURSDAY 6-10-93

0700 T. Gates checks out of motel - heading for site

0720 Arrive on-site, drillers are moving equipment closer to mud pit to drill ~~next~~ water supply well (SOUTH SIDE OF MUD PIT)

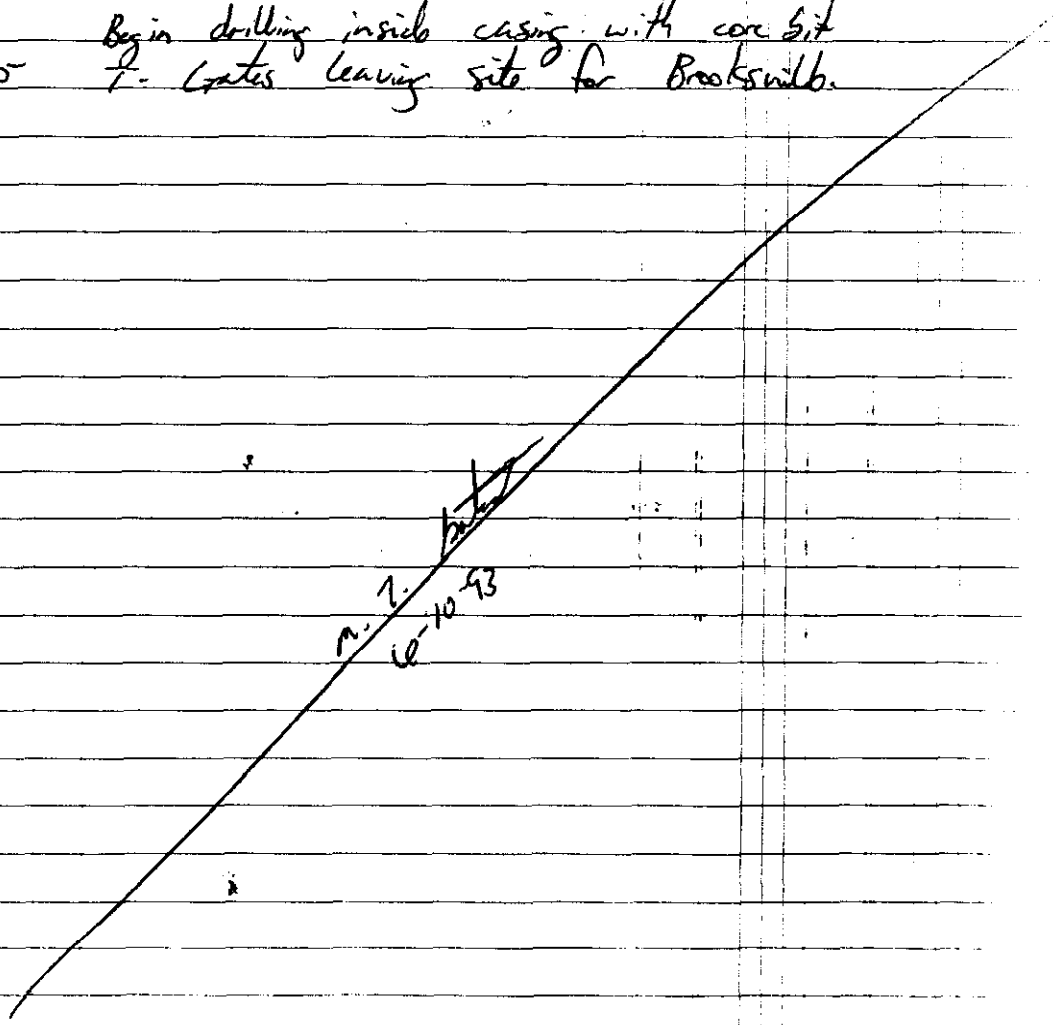
1030 Drilled to 36' (6 in into limestone) w/ 5 3/8 b.t. Installing 6" casing to 36'. Installed 36' of casing.

1130 J. Decker arrives on-site - inform him of progress, and coring & sampling done thus far.

1220 J. Decker offsite.

1230 Begin drilling inside casing with core bit

1345 T. Gates leaving site for Brooksville.



ROMP 5 Cecil Webb / CHARLOTTE CO. T. Gates
MONDAY 6-14-93

1100 T. Gates arrives on-site @ Cecil Webb. Organ & Pat are airlifting @ 49' 6" to remove cuttings.

1200 Stopping for Lunch.

1230 From 35-49' core is calc. lutite and marl. The 49-54' run is no recovery & the 54-55' is no recovery - sand.
Meter Monday Morn = 930614

1230 Meter = 1015824 begin airlifting

1330 Stop airlifting (to remove cuttings).

1345 Calibrating pH meter using 7.00 & 10.01 buffer solutions. Slope = 100.5 % ⇒ Good

1400 Collecting bag samples of sand, clay, phosphate gravel, limestone fragments because of No Recovery in core barrel.

1500 Collect bag samples from 59-84' b/s. Encounter soft but consistent green clay - confining unit @ base of Surficial Aquifer.

1515 Begin airlifting @ 89' before penetrating the clay confining unit at the Surficial. Meter: 1017171

1600 Collect Conductivity: 1230 u OHMS ~ 1347 gal

1615 Conductivity: 1226 u OHMS

$\frac{1347 \text{ gal}}{1} \times \frac{25 \text{ sec}}{5 \text{ gal}} \times \frac{1 \text{ min}}{60 \text{ sec}} = \frac{5 \text{ gal}}{25 \text{ sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 12 \text{ gpm}$

$\frac{1347 \text{ gal}}{1} \times \frac{1 \text{ min}}{12 \text{ gal}} = \frac{112 \text{ min}}{1} \times \frac{1 \text{ hr}}{60 \text{ min}} = 1.87 \text{ hrs.}$

1635 Conductivity: 1219 u MHOS
STOP AIRLIFTING: TOTAL TIME = 90 minutes, conductivity has stabilized.

1645 Conductivity 1215 u MHOS Cl 320 mg/l SO4: 530 mg/l

1645 Collecting water sample @ 89' b/s: ↓ begins raining
Temp: 25.7°C Cond: 1240 ph: 7.01

1730 Leaving site for hotel room

5.1 94.4

ROMP 5 Cecil/Webb T. GATES

TUESDAY 6-15-93

0700 Arrive on-site. Some standing water on the southwest side of site.

0730 Calibrating pH Meter using 7.00 & 10.01 buffer solutions. slope = 94.4% ⇒ Calibration good on 2nd try.

0750 Setting up to collect a spoon w/ plastic liner installed. Will push into the green clay confining unit @ bottom of surficial aquifer @ 89'.

0755 Depth to water: Top of Casing = 3.23' above land surface (alls) - dtw 5.1' toc = DTW = 1.87' bls Surficial Aquifer.

0800 CLAY unit from 84-129' bls is impermeable, CONFINING UNIT FOR THE SURFICIAL AQUIFER.

0825 Collect split spoon from 89-90.5' in the clay confining. Used plastic sleeve & plastic wrapped & taped the ends to create watertight seal, packed in cooler w/ ice. This sample will be tested for permeability by the FGS.

0900 Resume coring @ 89' bls. Records sample with depth

1200 Encounter limestone @ 129' also ∴ have artesian flow ~ 6" above land surface.

1200 Stopping for lunch while air lifting @ 129.

1315 Conductivity = 1188 μmhos, Discharge rate = 15 gpm

Meter = 10/8330

- 10/7171

1159 gal x 1 min / 15 gal

VOLUME: 77 minute purge time

1325 Stop air lifting ⇒ total purge time = 85 minutes

Will collect standard complete @ 129' bls

1335 Collect Water Sample @ 129' bls: Temp: 26.8°C

Cond: 1109 μmhos pH: 7.56 Cl: 340 mg/l SO4: <50

CONT'D.

ROMPS Cecil Webb — T. GATES

TUESDAY 6-15-93

1400 Collect water level @ 129' = 2.6' b/s. Continue coring. ~~times~~

1430 Limestone @ 128 - 129.5' then sand, Qtz, phosphate, clay 129.5 -

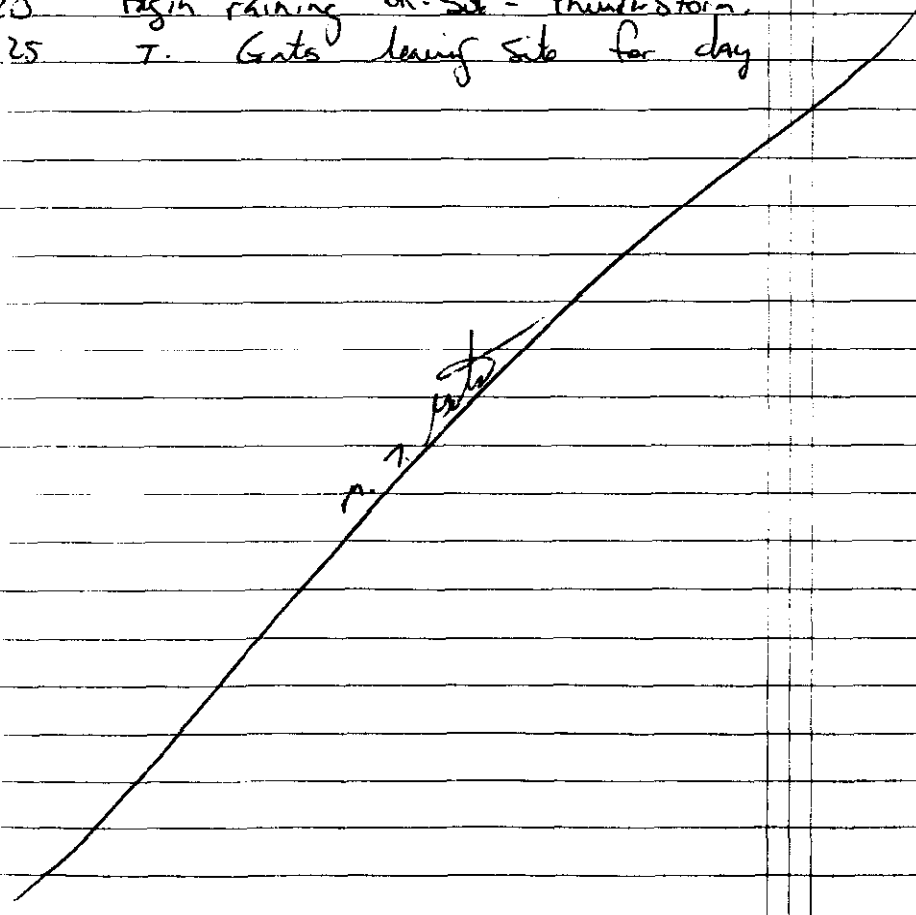
1510 Encounter hard limestone @ 149' b/s - will ~~reset the~~ pull the 4" drill at to 149', then reset 4" to 149' b/s

1515 Part of the core barrel breaks - stop drilling for repair.

1705 Drillers leaving site to purchase parts to fix core barrel sampler

1720 Begin raining on-Site - thunderstorm.

1725 T. Gates leaving site for day



T. GATES
-15-93

ls. Continue

e, phosphate,

~~Urset the~~ ~12-

4" to 149' bls.

drilling for

ts to fin

ROMOS Sec./Wells — Wednesday — T. Gates — Wednesday 6-16-93

0705 T. Gates, P. Meadows, K. DeGraf arrive on-site. Puddles of water standing on-site using pump to remove. Weather: ~79°, clear - high today ~92°F.

0720 Calibrating pH Meter using manual calibration mode: 10.01 & 7.00 buffer solution Slope = 94.2 %. Calibration within range.

0750 Measure water-level: TOC = 3.3 DTW = 4.9 DTW = 1.6' bls.

0800 Resume coring from 149', currently in sandy limestone, poor recovery, many sandy lenses.

0910 Reach 169.0' stop coring begin airlifting.
Meter: 10206 86 Discharge rate: 27 gpm
10 18330
2354 gals used Purge Time Eval = 94 minutes.

0920 Cond.: 1026 uMOHS 10:50

0935 Cond: 1147 uMOHS

0950 Cond: 11666 uMOHS

1005 Cond: 1172 uMOHS

1020 Cond: 1173 uMOHS

1035 Cond: 1176 uMOHS

1050 Conduct: 1175 uMOHS

1105 Conduct: 1173 uMOHS

1110 Stop airlifting, installing thief sampler.

1120 Collect water sample @ 169' bls w/ thief sampler. Will analyze for Cl, SO_4, TDS. TEMP: 25.5°C
COND: 1089 uMOHS pH: 7.09 Cl: 320 mg/L SO_4: 450 mg/L

1125 Resume coring @ 169' bls.

1200 T. Gates eating lunch.

1215 Murphy arrives on-site w/ trailer & supplies.

1245 Murphy offset continue coring

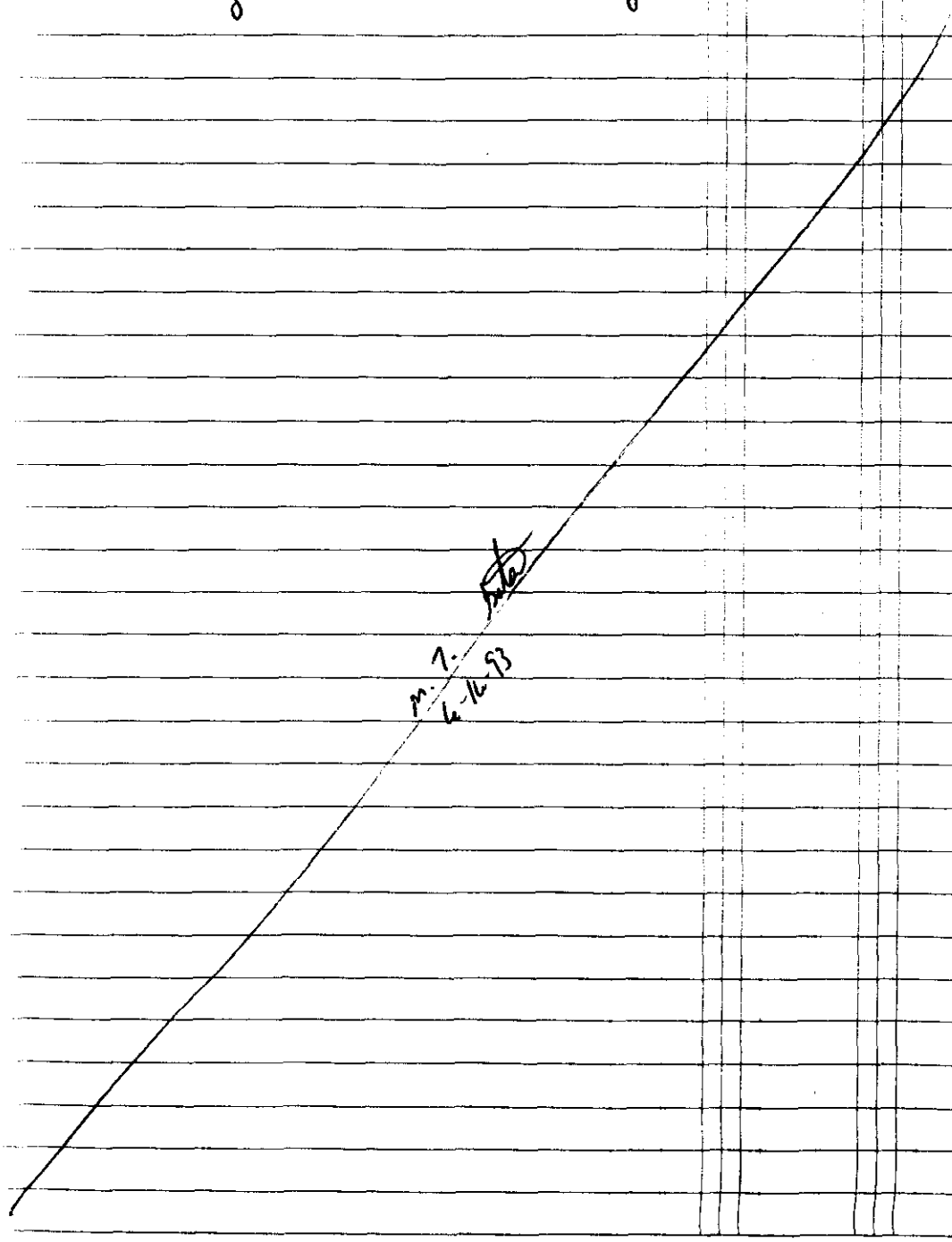
1430 Wireline breaks - wire goes down the rods - begin pulling rods.

RCMP 5/CECIL WEBB — T. Gates

WEDNESDAY 6-16-93

1300 Drillers are putting new cable on all the pulleys on the rig.

1530 Leaving site for the day.



ROMP S Coal Webb — T. GATES
THURSDAY 6-17-93

0700 Check-out of hotel driving to site.
0720 Arrive on-site, Pat & Kevin still working on respooling lines on rig.
0830 Calibrate pH Meter using 7.00 & 10.01 buffer solution. Slope = 93.8% calibration is within normal range.
Clay encountered @ 184.5' bls. - possibly confiner for the 1st transmissive unit in the Intermediate Aquifer.
0915 T. Gates preparing stratigraphy chart for drilling thus far & water samples collect from aquifer.
0955 Currently @ 199' bls in limey, sandy clay - probably confining unit below 1st transmissive zone
1045 Reach 209' bls. stopping for sampling.
1050 Begin air lifting. Discharge Rate $\frac{3 gal}{7 sec} \cdot \frac{60 sec}{1 min}$ = 43 gpm
Meter: 1026213 - (1020686) = 5527 gal used
1115 Conduct: 970 umhos 128 min. 1 volume
1145 Conduct: 855 umhos
1200 Conduct: 854 umhos
1215 Conduct: 854 umhos
1230 Conduct 859 umhos
1245 Conduct 860 umhos
1300 Collect sample @ 209' for STD. COMPLETE - 2nd Transmissive Zone of Int. Aquifer
Temp: 26.4°C Conduct: 882 umhos pH: 7.81
Cl: 320 mg/l SO4: < 50 mg/l
1315 Leaving site for Brooksville

T. Gates
6-17-93

30

ROMP 5 CECIL WEBB — T. GATES — MONDAY 6-21-93

1320 Arrive on-site @ ROMP 5, P. Mendors, J. Schindandiz on-site, preparing site, putting supplies away.

1330 DTW from casing = 7.48 (3.68) DTW = 3.80' from land surface.

1335 Resume coring @ 225' b/s.

Formation becomes clayey @ 209' b/s - appears to be confining layer below 4th 2nd Transmissive zone. Clay extends from 209-

1430 Copying Percentages & core recovery from PAT'S NOTES:

0-4	65%
4-6.5	100%
6.5-9'	56%
9-11.5'	40%
11-13'	100%
13-15	100%
15-17	65%
17-19	100%
19-21.5	40%
21.5-23.5	60%
23.5-25.5	60%
25.5-27.5	98%
27.5-29.5	80%
29.5-31.5	80%
31.5-33.5	85%
33.5-35.5	95%
Limestone	
36-39	95%
39-44	34%

Split Spoon Samples

CONTD.

GATES

J

, putting

3.80'

46

's

TS NOTES:

ROMPS CECIL WEBB — T. GATES

MONDAY 6-21-82

44-49	40%		
49-84 →	0% - COLLECTED BULK SAMPLES		
84-89	100%		
89-90.5 →	COLLECTED SPLIT SPOON OF CLAY		(100%)
90.5-94	20%	224-229	10%
94-99	66%	229-234	76%
99-104	24%	234-239	40%
104-109	100%	239-244	48%
109-114	50%	244-249	84%
114-119	100%		
119-124	76%		
124-129	64%		
129-134	62%		
134-139	34%		
139-144	18%		
144-149	34%		
149-154	40%		
154-159	34%		
159-164	20%		
164-169	46%		
169-174	20%		
174-179	32%		
179-184	48%		
184-189	50%		
189-194	50%		
194-199	74%		
199-204	26%		
204-209	48%		
209-214	30%		
214-219	40%		
219-224	26%		

CONTD.

32

ROMP 5 CECIL WEBB

T. GATES
MONDAY 6-21-93

1630 Encountered coarse sandy zone @ 2' Pat WASHING sand out. Have cored through clay since 209' 5/8 (CMS) H_2O samples. Will sample this pt this morning

1730 Leaving site for Hotel.

T. GATES
1-93
Pat
L clay
Will

ROMP 5 CECIL WEBB — T. GATES TUESDAY 6-22-93

0705 T. Gates arrives on-site. It appears that J. Schickendanz van was burglarized last night - the side door is open. (Wagner left door open). John
0730 Check water level = 1.52' bls (will verify after air lifting). Sampling @ 4 SAND LENS @ 259' bls
0735 Meter = 1031267 - (1026218) = 5054 gallons since 6-17-93. Discharge = 37.5 gpm
1 volume = 135 minutes. Begin Air lifting.
0745 Conduct. of Discharge = 1019 uMOHS
0800 Cond: 1125 uMOHS 1125 uMOHS
0815 Cond 1120 uMOHS Discharge = 50 gpm = 101 minutes to evacuate
0830 Cond 1114 uMOHS calibrated pH Meter with
0845 COND 1096 7.00 and 10.01 buffer; Slope = 94.8% ok.
- called Brooksville for site update spoke to D. Demuth J. Decker in the field. will stop by today.
0900 COND: 1082 uMOHS
0915 COND: 1072 uMOHS - Collected permeability sample of
0930 COND: 1062 uMOHS confining unit clay from core
0945 COND: 1077 box @ 247.2 - 247.8'
1000 COND: 1061
1015 COND 1055
1045 Collect 550 complete sample w/ this sample @ 259'.
Temp 26.0°C Cond: 1002 uMOHS pH: 7.46
Cl: 280 mg/L SO_4: < 50 mg/L
1050 Resume coring @ 259' bls.
1200 Stop coring @ 279' to sample. T. Gates leaving site for lunch. Begin air lifting.
1300 T. Gates back on-site.
1305 Conduct: 1022 uMOHS Volume = 42 min.
1330 Conduct 1020 Discharge Rate ~ 40 gpm
Meter 1032947 - (1031267) = 1680 gallons

Cont.

ROMP 5 Cecil Webb — T. GATES TUESDAY 6-22-93

1345 Conduct: 1022 umhos
1400 Collect Cl, SO_4, TDS sample @ 279' b/s.
Temp: 24.6°C Conduct: 1040 pH: 7.52
Cl: 320 SO_4: < 50
1430 J. Decker arrives on-site
1700 Stop coring @ 289'
1730 Leave site for Motel

ROMP 5

0700
0720
0742
0830
0840
1010
1015
1035
1050
1105
1120
1135
1150
1205
1230
1300
1430

pH 7.

ROMP 5 CECIL WEBB — T. Gates, WEDNESDAY 6-23-93

0700 T. Gates & J. Decker on-site @ ROMP 5.
0710 Check water level = Casing = 3.47 abls, DTW = 5.39 DTW = 1.92' bls.
0740 Calibrate pH Meter using 7.00 & 10.01 buffer solution using manual calibration. Slope = 95.2% Calibration good.
0830 Pat states that this Clay @ 284' has been "swelling" around the rods. CLAY is dk. green, stiff v. little sand - impermeable zone of Peace R. Fm. J. Decker off site to Utopia.
0840 Encounter DOLOMITE below Clay @ 299' bls.
1010 Stop @ 309' for water sample currently in SAND & limestone.
1015 START AIR LIFTING, METER - 1041384 - (1032947) Discharge = 30 gpm 8437 gal = 281 minutes
1035 Conduct: 1041 uMOHS
1050 Conduct: 1027 uMOHS
1105 Conduct: 1022 uMOHS
1120 Conduct: 1030 uMOHS
1135 Conduct: 1024 uMOHS
1150 Conduct: 1024 uMOHS
1205 Conduct: 1022 uMOHS
1230 Collect sample @ 309' in calcareous sand zone below confining clay layer in Peace River Fm. Collect SID. COMPLETE. Temp: 25.6°C Cond: 1016 uMOHS pH: 7.58 Cl: 300 mg/L SO_4: < 50 mg/L
1300 Resume coring.
1430 Currently in sandy clay. Collect PERMEABILITY SAMPLE @ 306 - 306.5' bls. Put in cooler. This will be a good Tertiary/Confining sample.

cont'd

ROMP 5 CECIL WEBB — T. Gates — WEDNESDAY 6-23-93

1600 Reach 349' stU in PEACE RIVER FM. Clayey, SANDY, phosphatic, clearing out hole with water

1620 Begin air lifting @ 349'bls Meter = 1046169 - (1041384)

1625 CONDUCT: 1250 umhos DISCHARGE RATE = 43 gpm

1640 CONDUCT: 1062 4785 gal TOTAL = 111 min 1 volume

1655 CONDUCT: 1039

1710 CONDUCT: MTG Stop air lifting to secure site & put equipment away.

1730 Leaving site for hotel.

Date

M. T.

Gates 6-23-93

SANDY, ter -(1041384) 43gpm min 1 volume. site

ROMP 5 CECIL WEBB

T. Gates

THURSDAY 6-24-93

0700 Check out of hotel room - heading for site.

0730 Measure water level in cocktail DTW (TOC) = 7.20
Top of Casing = 3.29 | DTW = 3.91' bls |

0740 Begin airlifting @ 349' bls. Discharge Rate 30 gpm

0755 Cond 1063 uMOHS

0810 Cond: 1092 uMOHS

0830 Cond: 1036 uMOHS 90 min

0845 Cond: 1026 uMOHS

0900 Cond. 1017 uMOHS Calibrating pH Meter w/ 7.00 &

0915 Cond: 1011 uMOHS 10.01 buffer Solution

0930 Collect STD COMPLETE @ 349' bls in SAND: Limestone (consistent interbedded limestone). Temp. 26.2°C
Conduct: 981 pH: 7.60 Cl: 300 mg/L SO4: <300 mg/L

0940 Resum coring

1200 T. Gates eating Lunch.

1230 Currently @ 384' bls - Pat is experiencing downhole problem with rods - NR in last barrel because it was jammed with sample.

130 Leaving site for Brooksville.

M. T. Gates
6-24-93

ROMP 5 Cecil Webb — T. GATES TUESDAY 6-29-93

0830 T. Gates arrives on-site. Measure water Level
TOC = 3.78 — TOC = 0.5 — DTW = 3.28' bls

0920 Measure conductivity of mud pit water (intake to auxhole) = 940 µMOHS.

0925 Calibrating pH Meter using 4 7.00 & 10.01 buffer solutions

0940 Charged solution - calibration at slope = 92.6 %

100 Conductivity of discharge = 980 µMOHS

1045 Begin air lifting @ 389' bls.

1050 Conduct: 1026 µMOHS DISCHARG RATE = 4/3 gpm

1105 Conduct: 1108 µMOHS METER 1052523 - (1046167) = 6354

1120 Conduct: 1079 µMOHS 1 vol. = 148 minutes

1140 Conduct: 1074 µMOHS

1155 Conduct 1068 µMOHS

1210 Conduct 1074 µMOHS

1225 Conduct: 1077 µMOHS

1240 Conduct: 1072 µMOHS

1250 Conduct 1068

1305 Collect Cl, SO_4, TDS sample @ 349' bls in Peace River ? SAND, CLAY.
Conduct: 1079 Temp: 26.8°C pH: 7.53
Cl: 300 mg/L SO_4: < 50 mg/L

1315 Resume coring.

1330 Drive west & call J. Decker @ Bracksville - inform him of progress conditions ect.

1500 Encounter well-indurated clay @ 389' bls - low permeability ~ 15% gtz sand 15% phosphatic sand - dk green (38-5/1).

1530 Wireline cable on-rig breaks - pulling core barrel out of rods.

1730 Stopping for day, Leaving site for hotel.
m. 7 Rain

ROMP 5 Cecil Wells — T. GATES — WEDNESDAY 6-30-93

0700 T. GATES arrives on-site.

0715 P. Meadors & J. Schindler resume replacing wireline cable.

0755 check water level. [TOC = (3.10)] [DTW TOC = 5.93'] [DTW BLS = 2.83']

0825 Calibrate pH Meter manually using 7.00 & 10.01 buffer solutions, slope = 92.7 % ⇒ Calibration O.K.

1000 Reach very tight clay confining layer 414 - 423.5' bls. very few accessory minerals.

1120 Stopping @ end of run 429 - currently in liner, slowly clearing - calculable - washing hole of cuttings.

1130 Begin airlifting @ 425'

1140 Conduct: 1233 Discharge: 50 gpm
Meter: 1061429 - (1052523) = 8906 gal

1155 Conduct: 1109 µmhos Wtd = 178 minutes

1215 Conduct: 1082 µMOHS

1230 Conduct: 1065 µMOHS

1245 Conduct: 1052 µMOHS

1300 Conduct: 1043 µMOHS

1315 Conduct: 1037 µMOHS

1400 Conduct: 1013 µMOHS called in spoke to J. Decker

1420 Conduct 1015 in Brooksville - informed him of site progress.

1440 Collect STD. COMPLETE @ 429' bls.
Temp: 25.6°C Cond: 935 µMOHS ph: 7.80
Cl: 320 mg/L SO4: < 50 mg/L

1450 Problems with the throttle on rig - stopping to repair

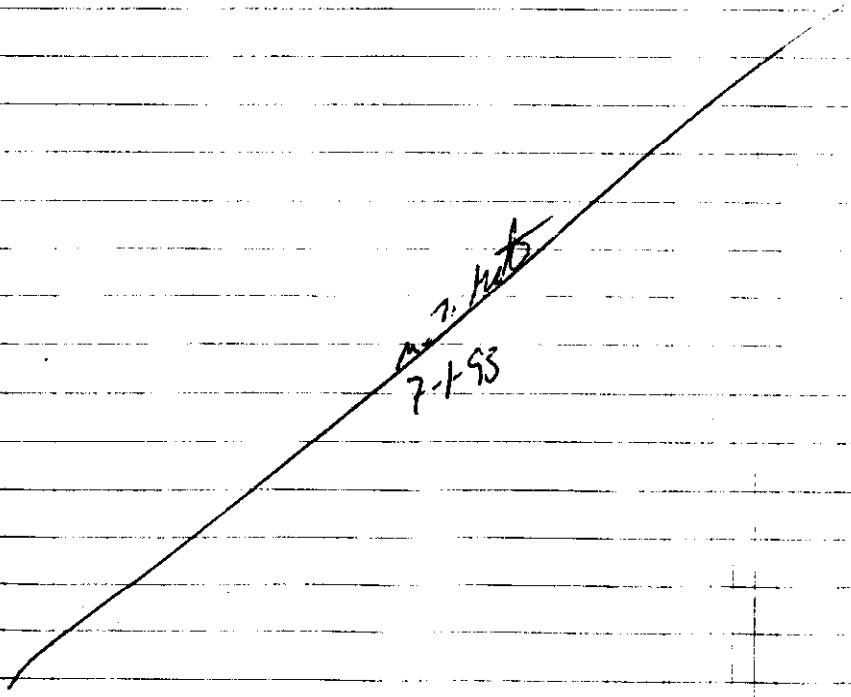
1720 Leaving site for hotel - One tech will be on site tomorrow to repair rig.

T. Gates

RMP 5 Cecil Webb T. GATES

THURSDAY 7-1-93 T. Gates

0740 Arrive on-site after checking out of hotel.
0800 D. Fancher arrives on-site to repair r.s.
0930 Pat leaves site to call in to Brooksville
1010 TOC = 3.15 ~~ft~~ lbs DTW = 6.33 DTW = 3.38' b/s
1015 Resume coring @ 429' ~~4~~ 5.
1030 Calibrate pH Meter manually using 7.00 & 10.01 buffer solution ⇒ slope = 99.9% o.k.
1200 Stopping @ 449' to collect water sample in permeable calcarenite zone. Conductivity is the same.
1210 Conduct: 1210 umhos Discharge Rate: 20 gpm
1225 Conduct 1186 umhos Meter = 1063992 - (1061429) = 2563
1240 Conduct: 1109 umhos 129 cu. ft.
1305 Conduct: 1102 umhos
1330 Leaving site for Brooksville - will sample Tues. Morning.



Romp 5 Cecil/Webb T. Gates

TUESDAY 7-6-93

1255 T. Gates arrives on-site. D. Meadors & J. Schakendanz on-site. They started air-lifting @ 1150. Currently @ 449' 6ls.

1300 Conduct: 1074 umhos

1315 Conduct: 1067 Calibrated Conductivity meter automatic setting, slope = 94.3% => O.K

1330 Conduct: 1066 Discharge Rate: 30 gpm

1345 Conduct: 1052

1355 Conduct: 1053

1415 Collecting Sample @ 449' for STD Complete analysis Temp: 27.0c Conduct 1166 ph: 7.45 Cl: 420 SO_4:

1420 Chlorides have increased from 320 @ 429' to 420 mg/l on this sample @ 449' 6ls.

1500 Put locked water level @ 1100 Today Casing = 3.40 DTW = 5.34 DTW = 5.94 6ls

1700 Stop drilling due to rain

1730 Leaving site for hotel.

M. T. Gates 7-6-93

ROMP 5 Cecil Wells

T. GATES
WEDNESDAY 7-7-93

0700 T. Gates on-site
0715 Water level is above casing with rods still in the hole ⇒ Artesian flow.
0720 Will remove rods & install clear tubing to get a good measurement of height of water. The artesian conditions were encountered between 445 - 489'. Most calcarenite & clay
0835 Depth to water = 0.45 above land surface
0915 Calibrate pH Meter using 7.00 & 10.01 buffer solution, slope = 95.5% o/c
1015 Begin air lifting @ 489' b/s Meter: 1068514-(1063992) in calcarenite of Arcadia Fm. = 4922 gal.
Discharge Rate = 30 gpm 164 min = 1 vol.
1020 Conduct: 1610 mMOHS
1035 Conduct: 1695 mMOHS
1050 Condct. 1692 mMOHS
⇒ Major increase in conductivity @ this sample depth 489'. From 1166 mMOHS to 1692 mMOHS.
1105 Conduct: 1687 mMOHS
1120 Conduct: 1690 mMOHS Discharg 30 gpm
1155 Conduct 1687
1230 Conduct: 1663
1245 Conduct 1662
1300 Conduct: 1653
1315 Called J. Acker @ Brooksville to inform him of site activities
1330 Conduct: 1640
1345 Cond: 1423 - alt casing up 20' for both
1400 Collect sample @ 489' b/s. Temp. 26.8°C
Cond: 1820 mMOHS pH: 7.66
Cl: 620 mg/L SO4: 150 mg/L

ROMPS Cecil Webb

T. GATES
WEDNESDAY 7-7-93

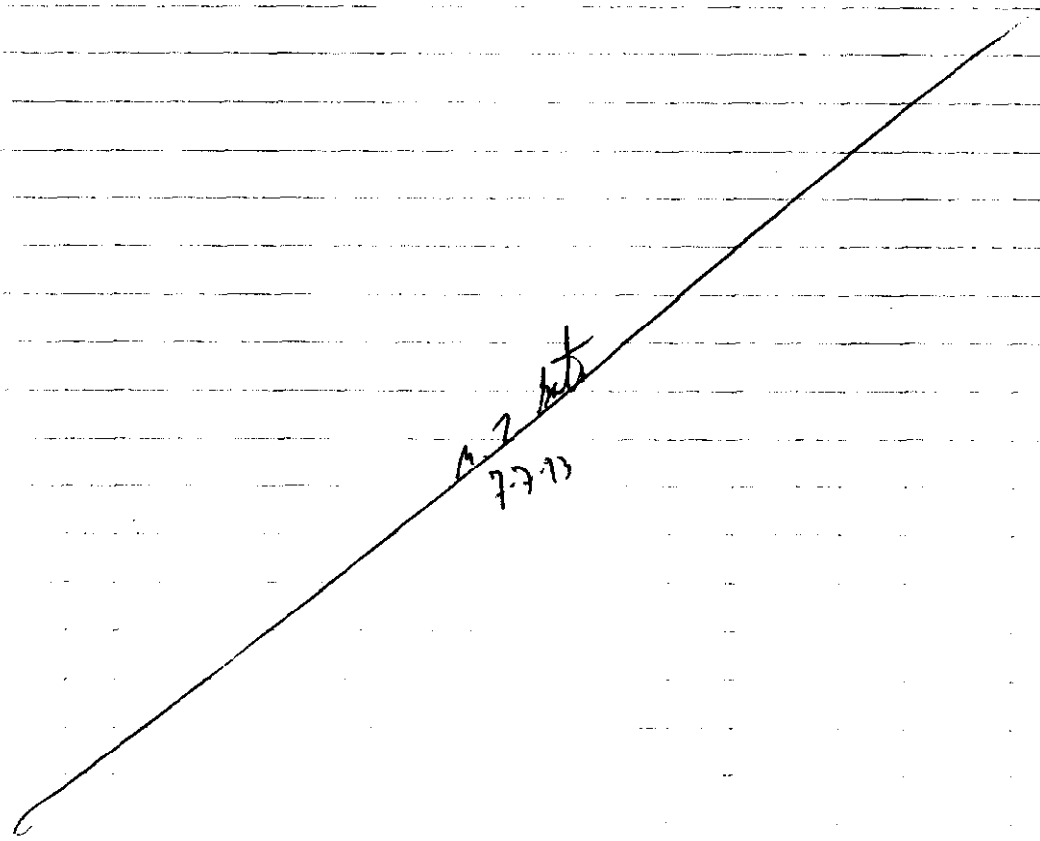
1500 The drilling process is using more water from the mud pit than previously. The formation is more ~~pervious~~ & permeable & harder ~ starting @ ~ 480.

1540 Can't retrieve inner barrel - formation was very hard from the last 6" of the 494-499 run. Pat & John begin removing rods from the hole.

1800 All rods out of hole - ~~inner bar~~ outer barrel partially. Hard dolomite sequence starts @ 490.7' bls - this is Arcadia Formation dolomite.

1740 Pat & John reinstalling rods into hole. I continue describing core

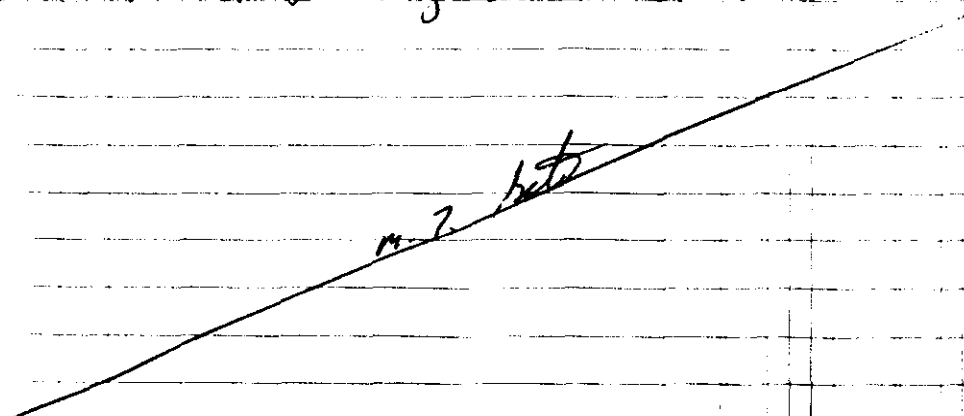
1930 Leaving site for hotel.



RAMP 5 Cecil Webb

T. GATES
THURSDAY 7-8-93

0700 T. Gates checks out of hotel.
0730 Arrive on-site. Drillers added riser to casing. Waiting for water level to stabilize for measurement
0740 Calibrating pH meter on automatic setting w/ 10.01 & 7.00 buffer solution. Slope = 91.8% ⇒ O.K.
0845 Adding additional riser to casing because height of water has increased
0905 Water level = 3.55' abls @ 499' ~~bls~~ water
1025 Reach 509' bls. Stopping to airlift. Murphy on site delivering a pallett of drilling mud.
1030 Meter: 10714.43 − (10689.14) = 2729 gal.
1035 Cond: 2080 µMOHS
1050 Cond: 2430 µMOHS Discharge = 30 gpm
1115 Cond: 2550 µMOHS Ludox = 90 min.
1140 Cond: 2720 µMOHS
1155 Cond: 2750 µMOHS 1200: Raising rods up 20' for bottom
1230 Cond: 2480 µMOHS
1245 Cond: 2490 µMOHS
1310 Collect sample @ 509' B/S.
Temp: 28.3°C Cond: 2640 µMOHS pH 7.64
Cl: 900 mg/L SO_4: 300 mg/L
1325 Pat & John begin removing alternator from air compressor.
1340 T. Gates leaving site for Brooks mtg.



ROMP 5 Cecil Webb — T. GATES.

MONDAY 7-12-93

0800 Left Brooksville in #870 w/ Trailer loaded w PVC casing material for Utopia & Cecil Webb site.

1500 Arrive @ Utopia - unloaded supplies - headed for Cecil Webb.

1645 Arrive @ Cecil Webb - begin unloading supplies.

1730 Leaving site for Motel.

* Note Water level @ C. Webb was 7.05' above land surface @ 509' a/s.

T. Gates 7/12/93

40

ROMP 5 Cecil Webb — T. Gates — Tuesday 7-13-93

0715 T. Gates on-site.

0800 Begin reinstalling core rods into hole before installing hole plug. Medium hole plug lists 10' per bag for 3½" hole. Kevin said the core hole is 8" and usually uses 1 bag / 13 ft. Continue adding hole plug @ rate of about 1 bag / 15 minutes.

1210 Lunch on-site.

1230 Continue adding hole plug through core rods

1732 Leaving site after adding 15 bags total of hole plug.

MTH 7-15-93

T. Gates 7-13-93

ROMP 5 Cecil Webb — T. Gates

WED. 7-14-53

0730 T. Gates arrives on-site after checking out of motel

0800 Bentonite plug was stuck in rods - blew it out using water. Bentonite was @ 210' inside the rods.

0900 Leaving site - returning to Brooksville

M. T. Gates

ROMP 5 Coal Wells — T. GATES — MONDAY 8-16-93 — ROMP

12:15 T. Gates, D. DeWitt on-site @ ROMP 5 from District w/ Graphysical Logging Truck. Raining on-site P. Meadors + K. DeGraff still removing rods from hole. — 0700

1400 Begin logging hole w/ caliper tool. — 1030

1630 Complete logging to 420' bls w/ caliper, multi-sonic tools. This is the Coalbed #2 logged prior to installing casing. Dave & I calculate ~ 1300 gals of grout for the casing. — 1615

1710 Leaving site for Motel

T. Gates 8-18-93

ROMP 5 Cecil Webb — T. GATES

TUESDAY 8-17-93

0700 T. GATES, D. Dewitt leaving Raf charlotte to ~~log wells~~ collect water sample from ROMP 5-1 Avon Park well in Sun City Center.

1030 Left site for Ruskin ECAPP Well.

1615 Complete logging in Ruskin leaving site for District.

ROMPS Cecil Webb T. Grimes

MONDAY 8-23-93

0800 Leaving Brooksville w/ Logger to Log casing following installation & grouting of 6" PVC casing to 420' b/s. Pat & Kevin couldn't get rods past 113' b/s - Think casing may have melted @ this point.

1045 Arrive on-site - flushing out of casing using 1½ pvc & pumping in water from intermittent monitor.

1200 Video-camera not working - cable @ camera unit head is fraying & affecting the picture. → Can't use video logger - will use caliper log only.

1330 Using caliper logger in hole.

1430 Caliper indicates that casing is intact and has not melted - but is most likely bent or dog legged @ ~113 - right where the drill bit could not go beyond.
Dave called Greg @ Brooksville - said to try to finesse the drill string beyond 113' w/ the 4 collars installed - if that didn't work - take 2 collars off & try again to get beyond the dog-leg without drilling into casing.

1440 Leaving site for District.

1445 Lunch @ McDonalds.

1800 Arrive back @ District.

M. T. 8-23-93

ROMP 5 CECIL WEBB — T. GATES

MONDAY 8-30-93

1000 Left Brooksville for Cecil Webb site to Video Log Hole. Previous logging showed that the casing had been broken & a second hole adjacent to the casing had been drilled from 94- ~117'. A previous attempt to block-off the second with a 4x4 12' resulted in the 4x4 becoming ~~Log~~ lodged in the well.

1400 On-site @ Cecil Webb - water standing on-site from recent rains ~ 6-10". Begin video logging. Video log shows that 4x4 is lodged in hole @ ~ 94' it appears to be sideways in the main hole & partially blocking the second hole. 5" liner casing is on-site to be the broken 6" if the 4x4 can be removed.

1600 Complete video - heading back to Brooksville

1830 Arrive @ Brooksville.

photo 7 8-31-93

ROMP 5 CECIL WEBB — T. GATES
TUESDAY 9-21-93

0830 T. Gates leaving ~~site for Brooks~~ Brooksville for ROMP 5 site. D. Dewitt spoke to P. Meadors yesterday evening. Pat said that the 4" steel casing should be set to 480' by ~1000 on Tues. They would be coring by 1100 or 1200.

1115 T. Gate arrives on-site. P. Meadors & K. DeGroot on-site removing core rods from borehole. They are swapping rods.

1130 Measure water level in 1st Transmission Zone well. Top of casing = 3.65' a.l.s. OTW = 5.53' TOC. DEPTH TO WATER BLS = ~~2.12~~ 1.88' b.l.s.

1200 T. Gates breaking for lunch.

1300 Begin installing core rods in hole.

1500 Begin coring.

1520 Core barrel retrieving tool is not going all the way to the bottom - can't connect to core barrel - should be @ 490.5' b.l.s.

1545 Tried flushing ~~core barrel~~ rods out w/ water - barrel retriever still not reaching bottom. Begin removing rods from hole.

1645 Found cuttings adhering to a small kink in one of the rods. Reinstalling rods.

1710 Collect 1st core from 490.5-494' b.l.s. - dolomite.

1720 T. Gates calls in to Brooksville, spoke to D. Dewitt. Told him of progress - he will send down logs w/ Schlumberger on Wednesday.

1730 Collect conductivity reading - 1100 umhos going into hole & 1100 umhos discharging from hole. We have artesian head - will check head in the morning.

1830 Leaving site for the day.

ROMP 5 CECIL WEBB
CORESITE

T. GATES
WEDNESDAY 9-22-93

0700 T. Gates on-site. Temp. High ~ 93° currently 80°

0715 Drillers on-site - setting up rods & casing to measure water level.

0745 Calibrate pH Meter using AUTOCALIBRATION MODE and 7.00 & 10.00 BUFFER SOLUTIONS. SLOPE reads 91.9% ⇒ CALIBRATION O.K.

0750 Measure DTW in 1ST TRANSMISSIVE ZONE INTERMEDIATE AQUIFER WELL - 5.40' below casing. TOC = 3.65' a/s.
DTW = 1.75' b/s.

0815 Measure corehole water level. water level = 11.60' a/s.
Capped off "T" in casing and used clear tubing attached to port in cap of drill rod to measure head.

0830 Collect STD. COMPLETE SAMPLE @ 509' b/s for comparison w/ SAMPLE COLLECTED @ this depth in July. Collected sample directly from casing discharge without using thief sampler. 4" steel casing should isolate upper zones. Dolomite zone @ 410' is upper confining unit for this zone. METER: 1074900 gallons.
NOTE: Well was allowed to flow overnight to purge corehole for morning sampling.
SAMPLE @ 509' b/s:
Temp.: 27.2° c COND: 2620 u MOHS pH: 7.70
Cl: 900 mg/L SO4: 300 mg/L.

1035 Begin purging corehole @ 529' b/s METER: 1076237
INJECTED 1357 gal while coring.

1050 Discharge rate = 30 gpm. 45 minutes purge 1 volume

1100 Conduct: 2610 u MOHS

1125 Conduct: 2620 u MOHS

1135 Conduct: 2630

1215 Collect Cl, SO4, Cond TDS, sample @ 529' b/s
Cl: 960 mg/L Temp.: 28.2° COND: 2610 u MOHS
pH: 8.03 SG:

54

ROMP 5 CECIL WEBB
COREHOLE

T. GATES
WEDNESDAY 9-22-93

1415 Reach 549' b/s stopping to airlift. The formation is interbedded gtz & phosphatic sandy clay & gtz sandy, phosphatic limestone - low permeability

1415 Begin airlifting. Meter = 1077954.

1420 Conduct: 1113 u MOHS TOTAL USED 1697 gal.

1435 Conduct: 2530 u MOHS Discharge RATE: 30 gpm

1450 Conduct: 2590 u MOHS Purge Time 56 min.

1505 CONDUCT: 2550 u MOHS

1520 Collect sample @ 549' b/o.: in clay limestone.
Temp: 28.9°C Cond: 2570 u MOHS pH: 8.09
Cl: — SO4: —

1730 Stopping for day @ 555' b/s.

1735 Leaving site for Motel.

55

P. 2 Date 9-22-93

P. 12

RCMP 5 Cecil Webb COREHOLE — T. GATES THURSDAY 9-23-93

0700 T. Gates arrives on-site.

0715 Measure water level in corehole 11.10' b/s. Measure water in 1ST Transmissive Zone Well. Water level = 5.50' b/s.

0730 Call in to Brooksville speak to D. DeWitt @ office update him on site activities.
NOTE: Currently we are pumping water from 1ST Transmission zone well into water truck and pumping water directly from tank ~~into~~ ~~coring~~ to the core bit. Conductivity of water in tank truck ~ 1140 μmohs (intake water). When coring the transmissive zones are detected by a change in the conductivity of the discharge water from 1140 μmohs.

0745 Meter = 1079311 - (1077954) = 1357 gallons USED

0750 Calibrating pH Meter using autocalibration mode and 7.00 & 10.01 buffer solutions; Slope = 92.4%.

0800 Begin airlifting corehole. Discharge RATE = 37 gpm

0810 Conduct.: 2570 μmohs

0820 Conduct: 2720 μmohs NOTE: WATER IS DISCHARGING AROUND CASING - CASING WAS UNSEATED

0840 Conduct: 2720 μmohs LATE YESTERDAY TO REMOVE "T" on top of CASING

0900 Conduct: 2730 μmohs

0925 Conduct 2730

Collect sample @ 569' b. STD. comp. analysis:
Temp: 28.5°C Cond: 2820 μmohs pH 7.76
Cl: 1040 mg/L SO_4: 300 mg/L

1005 Resetting 4" casing - drilling down another 1' into dolomite @ 490.5'.

1020 Casing is seated - resume coring @ 569' b/s.

1130 Core through light limestone layer @ 574-579 - major increase in head. Flow rate = 30 gpm. Stopping for lunch will let flow & collect sample after lunch. Meter: 1079922 (e 11 gallons.

56

ROMPS Cecil Webb
CORESITE

THURSDAY 9-23-93
TED GATES

1300 Measure conductivity - flow is discharging from both the casing (4") and the core rods. Estimate of combined flow ~60 gpm - flow through core rods only is 30 gpm. Measure conductivity from around casing = 2650 mMOHS Conductivity from rod = 2820.
Collect Sample @ 589' WATER from highly permeable zone.

Conduct: 2820 mMOHS Temp: 29.0°C pH: 7.57

1335 Measure water level in borehole: 11.10' ads

1400 T. Gates leaving for Booksville.

T. Gates 9-23-93

Ramp 5 Cecil Webb — Ted Gates
CORESITE — MONDAY 9-27-93

1040 Arrive @ coresite from Brooksville. Measure water level in corehole = 11.35' als. currently @ 589' 6/s.

1050 Begin purging well - allowing well to flow instead of airlifting. Discharge rate = 30 gpm thru core rods + ~ 20 gpm through 4" casing. Meter = 10 806 00 - (1079922) = 678 gallons. Purge time = 23 minutes.

1115 COND: 2740 μMOHS
Calibrated pH meter using fresh 7.00 & 10.01 buffer solution autocalibration mode, slope = 54.4%.

1120 COND: 2770 μMOHS

1130 COND: 2780 μMOHS

1200 Collect Cl, SO4, TDS sample @ 589' 6/s.
Temp: 29.0°C COND: 2790 pH: 8.13

1215 Breaking for lunch-on-site.

1245 Resume coring @ 589' 6/s.

1415 Reach 609' Meter 1081716 - (1080600) = 1.116 gallons
Allowing well to discharge without airlifting

1425 COND: 1396 μMOHS - cuttings returning

1435 COND: 2960 μMOHS discharge 30 gpm Purge Time 37 minutes

1445 COND: 2790 μMOHS

1500 COND: 2860 μMOHS

1510 COND: 2900 μMOHS

1515 COND 2920 μMOHS

1580 Collect STD. COMP. @ 609' 6/s.
Temp: 29.1°C COND: 2940 μMOHS pH: 7.91
Cl: 1080 ppm SO4: 400 ppm

1730 Reach 529'. Stopping for day. Leaving site for hotel - begins raining.

GT Gates
5-27-93

ROMPS CECIL WEBB
LORESITE

T- Gates
TUESDAY 9-28-93

0700 T- Gates arrives on-site. Allowed well to flow overnight and purge the bore hole - will collect sample this morning @ 629' b/s.

0745 Calibrated pH meter using 7.00 + 10.0 buffer solutions using manual calibration mode. Slope = 93.7 %.

0 ~~Collect sample @ 629' b/s~~ meter
~~Temp~~ ~~Cond.~~ ~~pH~~ meter
~~Cl~~ ~~SO4~~ meter

0820 Use this sample to collect sample. Sample ~~not~~ does not appear to be representative. Conductivity of sample water is only 2670 μmhos. Installing air line to purge core hole.

0830 conduct: Meter 1083085 (-1081716) = 1369 gal

0850 Cond. 2840 μmhos Discharge = 43 gpm 32 min

0905 Conduct: 2850 μmhos

0920 Conduct. 2850 μmhos

0930 Collect sample @ 629.0 after airlifting.
Temp: 28.6° C COND: 3010 μmhos pH:
Cl: 1100 mg/L SO4: 400 mg/L

1250 Reach 649'.

1155 Begin airlifting @ 645' b/s.

1200 COND: 1650 μmhos AIRLIFT DISCHARGE: 25 gpm

1215 COND: 2200 μmhos Meter = 1084682 - (1083085) = 1597

1240 COND: 2410 μmhos 64 minutes

1255 COND: 2530 μmhos

1300 COND: 2590 μmhos

1315 COND 2640 μmhos

1330 Collect Cl, SO4, TDS sample @ 649' b/s.
Temp: 29.0°C COND: 2710 pH: 8.17

1455 Reach 669' b/s. Begin airlifting.
Meter = 1085483 - (1084682) = 801 gallons.
Discharge rate = 25 gpm 32 min.

RAMP 5 Cecil Webb — T. GATES
CORESITE — TUESDAY 9-28-93

1500 COND: 1470 uMoHS
1520 COND: 2060 uMoHS
1530 COND: 2580 uMOHS
1540 COND: 2350 uMoHS
1545 COND: 2400 uMoHS
1600 Collect Cl, SO_4, TDS Sample @ 669.0' b/s.
Temp: 29.0°C COND: 2260 pH: 8.11
Cl: 780 SO_4: 400 mg.
1720 Call in to office to update B. Daniel.
1735 Reach 689' b/s - airlifting to clean-out hole
1750 Leaving site to hotel.

T. Gates 9-28-93

RCMP S CECIL WEBB — T. GATES
CORESITE — WEDNESDAY 9-29-93

0700 T. GATES arrives on-site. Measure water level in corehole = 11.35' b/s.

0730 Calibrate pH Meter w/ autocalibration setting using 7.00 & 10.01 buffer solution. Slope = 95.7%
Meter = 1086450 used 967 gallons.

0740 ~~Begin airlifting discharge rate~~ NTU. Collect sample prior to airlifting for comparison with sample collected after airlifting @ 689' b/s.
Temp: 27.6°c COND: 2190 mMOHS pH: 7.42

~~0750~~ ~~COND~~ Begin airlifting. Discharge = 25 gpm

0800 COND: 2550 40 minute lunch

0815 COND 2580

0830 COND: 2610

0855 COND: 2630

0915 COND: 2650

0930 Collect Cl, SO4, TDS sample @ 695.0' b/s.
~~pH~~ Temp: 28.0° COND: 2720 pH: 7.74
Cl: 920 mg/L SO4: 350 mg/L

1150 Reach 709' stop for airlifting. Meter = 1087747
Used 1297 gallons thus far. Discharge = 30 gpm

1155 COND: 1790 mMOHS 45 minute purge time

1210 COND: 1790 mMOHS

1230 COND: 1910 mMOHS

1240 COND: 1940 mMOHS

1255 COND: 1970

1310 COND: 1980

1320 COND: 2000

1345 SAMPLE @ 709' collect STD. COMP.
Temp: 29.2°C COND: 1480 mMOHS pH: 8.11
Cl: 460 mg/L SO4: 200 mg/L
Water quality change - 709' - dolomite is fractured - transmissive zone. Conductivity & Chlorides are decreasing.

ROMP 5 CECIL WEBB — T. GATES
CORESITE — WEDNESDAY 9-29-93

1530 Reach Swannee limestone @ 711.9 bls. Swannee is white, very soft, loosely cemented, clayey calcarenite.
1600 Stop @ 725' for airlifting. Meter = 1089258 15 H gal.
1610 COND: 1540 µMOHS — Discharge: 30 gpm
1625 COND: 1790 µMOHS — 51 minutes
1650 COND: 1920 µMOHS
1705 COND: 1960 µMOHS
1720 COND: 1920 µMOHS.
1730 Set up recorder for water level will sample in the morning.

9-5-93

ROMP 5 Cecil Webb — T. GATES
CORESITE — THURSDAY 9-30-93

0700 Check-out of hotel - leave for coresite.

0730 Arrive on-site - measure water level of core hole. Measure = 11.15' a/s. Calibrating ph meter using 7.00 & 10.01 buffer solutions. Slope = 93.5%

0740 Resume air-lifting @ 729'.
COND: 1980 uMOHS
Measure DTW in 1st Trans. Zone well = 5.43 TOC
T.O.C = 3.65' a/s. Measure = Trans. = 1.78' b/s.

0805 COND: 1900 uMOHS

0825 COND: 1910 uMOHS

0840 Collect sample Cl, SO_4, TDS @ 729.0'.
Temp: 29.0°C COND: 1680 uMOHS pH = 8.01
Cl: SO_4:

0900 Call in to office to discuss casing setting.

0910 Dave tells me to stop coring. Speak with C. McQueen about communicating more with office. I should have called in before penetrating Sunnamee @ 711' b/s. Discuss setting casing @ 705' in dolomite. We will now have to backplug w/ cement @ from 731 to 700'.

1030 call back to Brooksville - speak to Greg about grout calculations. Pat speaks to Greg.

1130 Begin mixing grout.

1205 Begin pumping in 30 gallons of cement (8 - 47 lbs bags) of cement. Core rods are on bottom @ 731' b/s.

1210 Begin pumping in 138 gallons of H_2O on top of cement in rods.

1220 All 138 gallons are in the rods. Begin pulling 80 ft of rods - will be @ 650' b/s

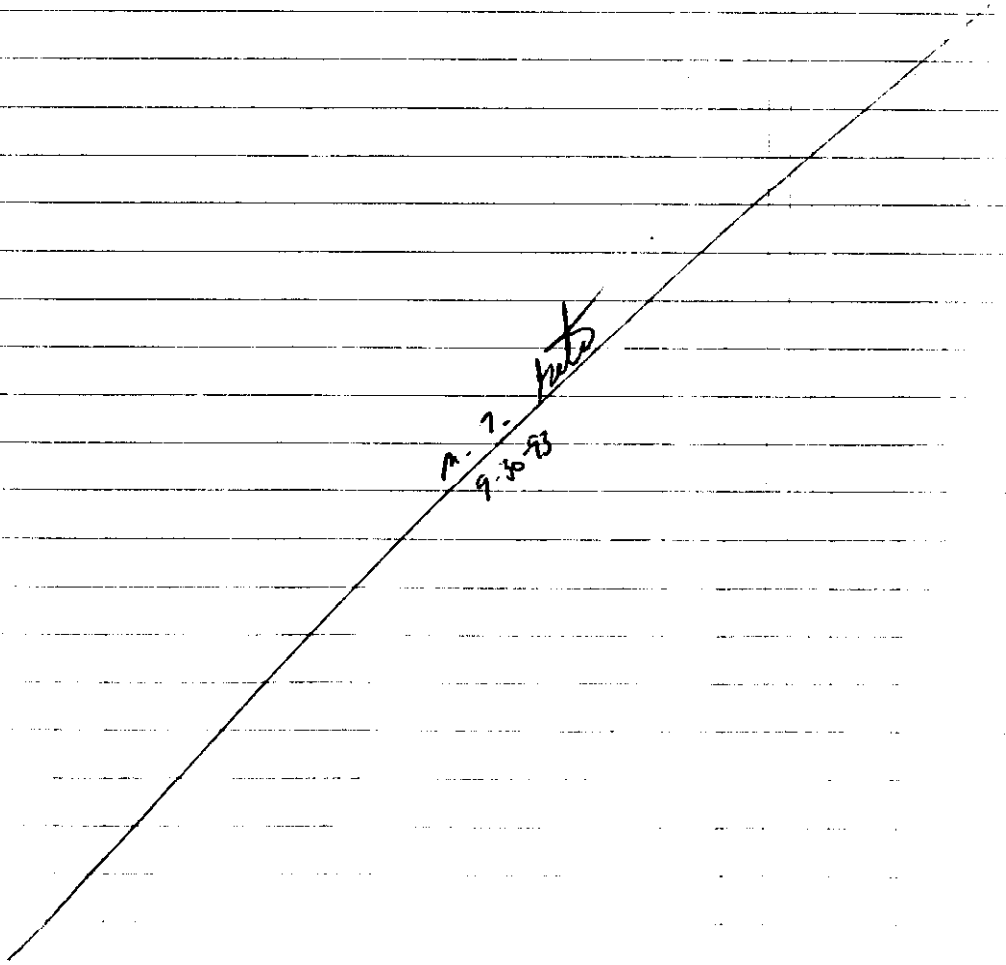
1230 Cement should be from 731 - 650'. No flow from the core rods - can't see water in the rods.

1235 Begin flushing rods with water.

1239 Water flowing from core rods.

Romp 5 Cecil Webb — T. Gates
CORESITE — THURSDAY 8-30-53

1237 Air & water flowing from core rods.
1238 Flow stops from core rods.
1240 Lesser flow coming from rods.
1241 Installing 40' of rods + the 5' of Kelly - bottom of rods will be @ 655' G/S
1250 Begin flushing rods w/ water @ 655'.
1315 Stop flushing rods. Begin removing rods from hole.
1320 T. Gates leaving site for Brooksville.



COMP S. Cecil Webb — Ted Gates

CORESITE — MONDAY 10-11-93

1300 T. Gates arrives on-site. Pat & Murphy on-site installing core rods (K. DeCrost out-sick). Currently rod @ 380' b/s. Casing is set @ 705' b/s.

415 Murphy off site. Mechanics on-sit servicing the compressor.

1430 ~~T. Gates helping with~~ Resume coring @ 705' b/s

1715 Stop coring @ 719' b/s. Core is ½ Calcarenite & ½ cement.

1740 Leaving site for hotel.

M. 1-
11-4-93

ROMP 5 Cecil Wells — T. Gates
COAL SITE — TUESDAY 10-12-93

0700 T. Gates arrives on-site
0715 Water level @ casehead = 11.40 ft. abs.
0745 Calibrate pH Meter using autocalibration = 7.00 & 10.01 buffer solution slope = 98.8 % ⇒ good.
0930 Th 724-729 mtr run - Meter 1092450 - just getting out of the casehead - small amount of coal visible.
0940 Th 719-724 mtr run = 60% recovery.
0945 Call in to Brooksville - speak to Becker & G. McQuown - Kevin is sick again today - will be Pat and myself only today. Mechanic On-site to repair generator.
1210 T. Gates leaving site to lunch currently @ 744' b/s
1300 T. Gates back on-site
1320 Begin airlifting @ 744.0 mtr b/s. Meter = 1095738
COND: — Discharge rate = 15gpm [3288 gal used]
1340 Mechanic offsite to Brooksville. 24 minutes purge time.
1345 COND: 1290 umhos
1400 COND: 1300 umhos
1445 COND: 1330
1455 COND 1320
1510 COND: 1330
1520 COND: 744 mtr
1540 Collect STD. COMP. Sample @ ~~744~~.0' b/s.
Temp: 28.6°C COND: 1350 umhos pH: 8.71
Cl: 400 mg/L SO4: 200 mg/L
1550 Recalibrate pH Meter.
1720 Sand line breaks trying to retrieve barrel @ 749-754'.
1740 Leaving Site.

10-12-93

RMP 5 Cecil Webb — Ted Gates
CORESITE — WEDNESDAY 10-13-93

0700 T. Gates arrives on-site - did not set up to vacuum condensate water level because barrel was left in the hole rods after cable broke yesterday.

0830 K. DeGroot on-site.

0915 Calibrate pH Meter using manual calibration : pH 7.00 & 10.01 buffer solution, slope = 92.1%. Barrel is now out of rods - will respool new cable reinsert core rods & resume coring @ 754-757' interval.

1130 Core barrel is out and new cable is installed - stopping for lunch.

1400 Reach 769' sample point. Meter = 1098404
Discharge Rate = 20 gpm
[vault 21666 gal]

1410 Cond: 1820

1425 Cond: 2020 — 133 min pump time.

1440 Cond 2040
Raising rods up 20' off bottom. A large amount of sand is returning in the discharge from pumping.

1450 Lowering rods back to bottom to try and flush out.

1455 Cond: 2070

1530 COND: 1980

1540 COND: 1980

1550 COND: 1980

1605 COND: 2000

1620 Collect Cl, SO_4 lbs @ 769.0' GLs.
Temp: 29.2° COND: 2070 pH: 8.16
Cl: 680 SO_4: 300

1640 Encounter sand lens on the 769-774' run - only 20% recovery. Air lifting again to try and remove sand.

1730 Pulling rods up & stopping for the day.

1740 T. Gates leaving site.

10-13-93

ROMP 5 Cecil Webb — Ted Gates

CORESITE — THURSDAY 10-14-93

0700 Check out of hotel - driving to site.

0730 Arrive on-site. Continuing to airlift sand from corehole - the sand lens is approximately 3-4' thick from 769 - 773'.

0815 P. Meadows calls office. Will mix up some thin mud and circulate it down to try and seal off the sand lens.

Light rain on-site.

1040 Mud has been injected - sand has cleared - will resume coring.

1230 Calibrate pH Meter using autocalibration and 7.00 and 10.01 buffer solution, slope = 92.6%.

1240 Reach 789' begin airlifting. Meter: 1100824

COND: 1460 Discharge: 30

1250 COND: 1600 [Used 2420 gallons]

1310 COND: 1940 80 min purge time

1330 COND 2050

1340 COND: 2100

1350 COND: 2120 umhos

1400 Collect sample @ 789'.

Temp: 29.3°C COND: 2140 pH: 8.12

Cl: SO_4:

1430 Leaving site for Brooksville.

M. T. Gates
10-14-93

ROMP 5 Cecil Webb — Ted Gates

CORESITE — MONDAY 10-18-93

1200 Arrive on-site. Partly sunny, humid temp. ~85° F. ~~Hot~~ Resume coring @ 789-794. K. DeGroat drilling, J. Schickendanz also.

1520 Calibrating pH Meter using auto calibration w/ 7.00 and 10.01 buffer solutions. Slope = 94.8%.

1530 Reach 809', begin airlifting. Meter = 1103568

1535 Cond: 1110 — Used: 2744 gals.

1550 COND: — — Discharge rate: 20 gpm

1610 COND: 2160 — 137 min purge time

1620 COND 2160

1645 COND: 2170

1700 COND: 2170

WATER level in coreholes this morning = 11.85' a.l.s.

1715 COND: 2210

1730 T. Gates leaving site for the day. Will sample in the morning

M.T. Gates 10-18-93

Ramp 5 Cecil Webb — Ted Gates
CORESITE — TUESDAY 10-19-93

0700 T. Gates arrives on-site - Sun just rising.
Weather: Currently 72° F high today 90° F.
0730 Preparing to collect sample @ 809' - Net water flow overnight.
0735 Calibrating pH Meter using autocalibration and 7.00 and 10.01 buffer solution. Slope = 93.9 %.
0745 Collect Cl, SO_4, TDS sample @ 809' b/s.
Temp: 28.3 °C COND: 2240 u mhos pH: 7.49
Cl: 740 mg/L SO_4: 300 mg/L
0800 Reset the water level measuring stick. Adjusted datum for land surface.
0830 Measure water level 12.00' a/s.
0930 P. Meadors on-site.
1000 J. Schuckendance offsite - heading back to Brooksville.
1130 Reach 829' b/s. stopping to airlift. Meter = 1105804
1140 COND: 1040 - 1103568
1215 COND: 2050 used 2236 gal
1230 COND: 2110 Discharge Rate: 25 gpm
1245 COND: 2160 89 minute purge time
1300 COND: 2160
1315 Collect STD. CONCRETE @ 829' in parnall calcarenite.
Temp: 29.5°C COND: 2130 pH: 7.78
Cl: 680 mg/L SO_4: 300 mg/L
1445 Reach 849' stopping to airlift. Meter = 1107307
1450 COND 1030 - 1105804
1505 COND: —— used: 1503 gal
1530 COND: 2070 Discharge Rate = 30 gpm
1545 COND: 2140 50 min purge time
1600 COND: 2150
1610 Collect Cl, SO_4, TDS @ 849'.
Temp: 29.4 COND: 2150 pH. 8.21
1730 Leaving site for the day.

RCMP 5 Cecil Webb — Ted Gates
COMPOSITE — WEDNESDAY 10-20-1993

0710 T. Gates arrives on-site. Borehole water level = 11.80 als @ 859' bls.
0730 Calibrating pH Meter using auto calibration mode and 7.00 and 10.01 buffer solutions. Slope = 98.7 %.
0910 Reach 869' stop airlifting. Meter: 1110514
0920 COND: 820 mmoHS — 1107307
0940 COND: 1620 — used: 3207
1000 COND: 1970 — DISCHARGE RATE: 20 gpm
1020 COND: 2110 — Purg Time: 160 min
1040 COND: 2160
1055 COND: 2150
1130 Collect Cl, SO_4, TDS @ 869' bls.
Temp: 29.1°C COND: 2180 pH: 8.02
Cl: 700 mg/L SO_4: 300 mg/L
~~1330 Reach 889' stopping to airlift. Meter = 1112781~~ MTG
~~1335 COND: = 1110514~~
MTG. Water: Discharge Rate: Purg Time:
1530 Reach 889'. Encountered qtz sand lens @ 871' bls. Runs for 879-884 & 884-889 were both 0 % recovery. Having problems getting water to discharge from line during airlifting. It appears that sand has filled the borehole or the water has so much sand mixed in that airlifting will not remove it.
1580 Sand starting to discharge with water during airlifting with rods 20' off bottom.
1505 No sand or cuttings returning. Meter: 1113025
1530 Pat calls Brocksmithe. Adding additional airlift PVC.
1600 Airlifting @ 869' to remove sand. Schedule on-site picking up casing.
1730 Leaving site for day. — M. T. Hall

ROMP 5 Cecil Webb
CORESITE

Ted Gates
THURSDAY 10-21-1993

0700 T. Gates checks out of hotel. Allowed crackle to flow overnight.
0725 Arrive on site. Airlifting @ 869' to tag and remove sand. Water level was 12.10' a/s
0800 Airlifting @ 889' b/s. Meter = 1113025
0940 COND: 2040 micromhos used 111514 / 2511
1000 COND: 2070 Discharge 60 gpm
1010 Calibrate pH Meter 41 minute purge time
using auto calibration mode: 7.00 & 10.01 buffer solutions. Slope = 93.8%.
10.15 Collect STD. COMPLETE SAMPLE @ 889' in sand zones
Temp: 29.7°C COND: 2010 pH: 7.88
Cl: 600 mg/L SO4: 200 mg/L
1130 Mary Ann Kowalik and 2 other person from Reserve Evaluation Department stop by site to observe site activities.
1300 Stopped drilling @ 905' to air lift.
T. Gates leaving site w/ Mary Ann et al to eat lunch, then to District.

T. Gates
10-21-93

ROMPS Cecil Webb — Ted Gates
CORESITE — MONDAY 10-25-93

1230 T. Gates arrives on-site. Airlifting @ 909'66.
Pat stated water level in condenser was 12.25.
1240 Cond: 2040
1250 Collect Cl, SO_4, TDS @ 905'.
Temp: 25.3°C COND: 1950 pH: 8.02
Cl: 920 mg/L SO_4: 160?
Knock Stopped @ 924' to airlift cuttings up.
1720 Stopping @ 925' for day.

M. T. Foster
10-25-93

Kevin says he will be gone in 1 month

Gates
3
909'66.
12.25.

pH: 8.02

up.

ROMP 5 Carl Webb — Tel Gates

CORESITE — TUESDAY 10-26-93

0700 T. Gates arrives on-site. Water level in corehole = 12.65' a/s.

0730 Decide to ~~pump~~ core to 949' before collecting sample due to the low porosity & permeability of the core.

0900 Calibrate pH Meter using autocalibration and 7.00 & 10.01 buffer solutions. Slope - 94.5%.

1215 Reach 949'6/s. stop to airlift. Meter: 1123565

1230 COND: 1520 ~2500 ~~111325~~ micro-

1300 COND: 1940 Discharge = 60 gpm

1315 COND: 1960 41 minutes.

1330 COND: 1990 1345: 1980

1400 Collect sample @ 949' STD. COMPLETE.
Temp: 29.2°C COND: 1990 u MOHS pH: 8.02
Cl: 520 mg/L SO4: 900 mg/L

1500 Raining on-site.

1630 Rain stops.

1700 Call in to office - speak to J. Clayton. Airlifting @ 964'6/s.

1730 Leaving site for the day.

M. T. Gates
10-26-93

T-1

Zone 5 Cecil Wells — Ted Gates
ONSITE — WEDNESDAY 10-27-93

0700 T. Gates arrives on site. Drillers setting up to measure water level - allowed well to flow overnight.
0740 Calibrating ph Meter using 7.00 & 10.01 buffer solutions. Slope = 92.0 %
0740 G. McQueen on-site.
Water level in conchalp.
0745 Greg conducting performance reviews w/ Pat & Kevin.
1050 Resume coring @ 964'. Currently in clayey calcilutite - few visible fracture traces; poor permeability
1110 Reach 969' stop to air lift. Meter: 1126561
1120 Cond: 1150 1123565
1135 COND: 1840 2996
1150 COND: 1950 Discharge rate = 60 gpm
1205 COND: 1970 49 minute purge time
1220 COND: 1980
1245 Collect Cl, SO_4, TDS @ 969' b/s.
Temp: 29.2° Cond. 1980 pH: 8.12
Cl: 540 SO_4: 250
1545 Encounter dolomite @ 980' b/s. Flowing - Conductivity is 2960 umhos.
1600 Call Brookside speak to J. Clayton - sounds like we are in the Ocate limestone.
1610 Collect sample directly from rods @ 984' b/s.
Cond: 3000 Temp 29.5°C pH 7.94
Cl: 900 mg/L SO_4: 350 mg/L
1650 Collect STD. cond. w/ thief sampler @ 984' b/s.
Temp 30°C COND: 3020 pH: 7.93
Cl: 960 SO_4: 400
1705 Collecting water level.
1720 Leaving site for the day.

M. L. Bates
10-27-93

d Gates
-27-93
p to measure
lt.
buffer

Pat & Kevin
clayey
permeability
26561
23565
2996
6 = 60 gpm
purg time

Conducting
soils Lab

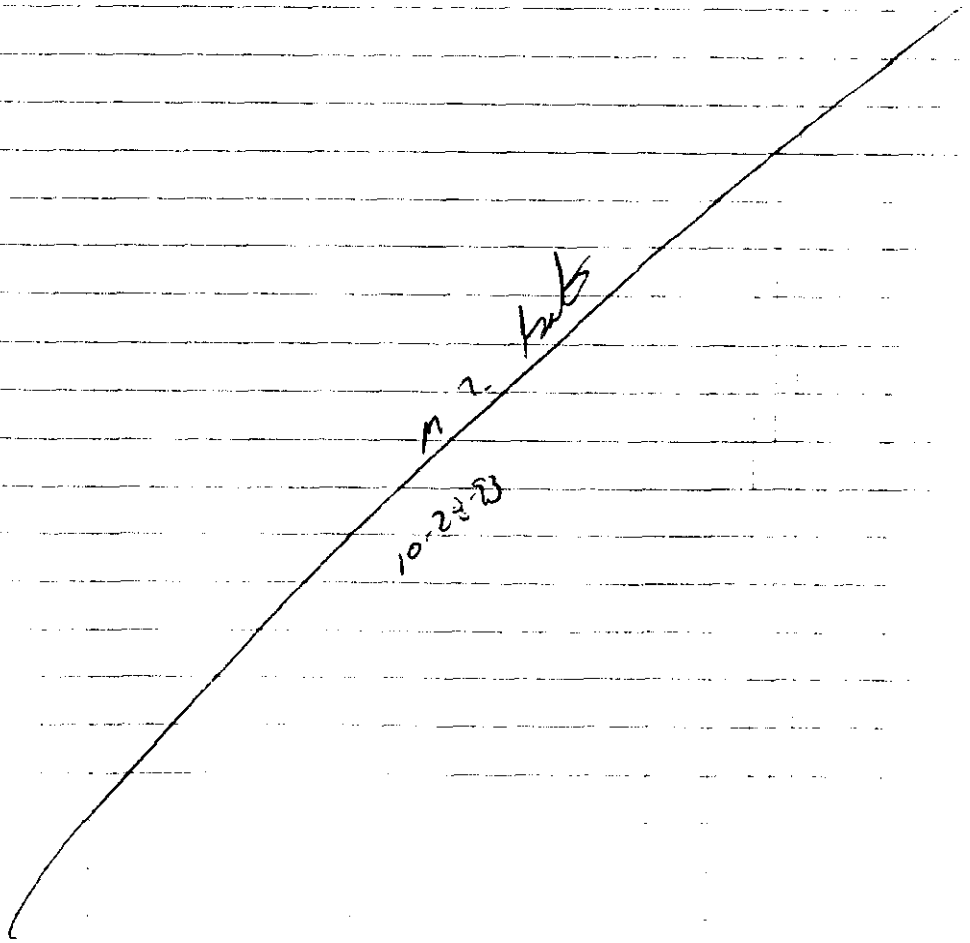
pH 7.94

4' Bls
= 7.93

ROMP 5 Cecil Webb — TED GATES

CORESITE — TUESDAY 10-28-93

0700 T Gates checks out of hotel.
0740 Arrive on-site @ Romp 5.
0742 water level in corehole = 11.85' dls @ 984' bls.
0830 Calibrating pH Meter on autocalibration setting using 7.00 = 10.01 buffer solutions. Slope = 92.9%.
1000 The Dolomite extends from 980.0 - 989.0. This appears to be an unconformity between the overlying Suwannee Fm. and underlying Ocala Limestone.
1300 Reach 1004' stopping to set L.T.
1330 T. Gates leaving site, heading for Brooksville



RAMP 5 Cecil Webb — T. Gates

CORESITE — MONDAY 11-1-93

1100	T. Gates arrives on-site. D. Raphun on-site - Pat will be leaving to do some drilling @ RAMP 14 today	0700
1110	Water level in casehole = 12.70' a/s	0715
1130	Collect sample @ 1009'. Sample is very sandy	
1145	Inserting airlift line begin purging - will collect another sample after airlifting out sand.	0720
		0730
1200	COND: 3020 — Meter: 1133255	0745
1250	COND: 3030 — Discharge: 40 — 1126561	0800
1315	COND 3020 — 167 mi — 6694.	0825
1330	Collect STD samp @ 1009 in Ocala Limestone	0840
	Temp: 28.2°C — COND: 3000 umohs — pH: 7.55	0900
	Cl: 980 mg/L — SO4: 400 mg/L	0915
1400	Doug & Pat back on-site - currently casing @ 1014.	0930
		0945
1720	Stopping @ 1025 in Ocala calcilutite	
1730	Leaving site for the day.	
		1300
		1305
		1320
		1345
		1400
		1415
		1430
		1500
		1650

M. T. 11-1-93

Pumps Coral Wells — Ted Gates

CORESITE, TUESDAY 11-2-93

0700 T Gates arrives on-site.
Temperature ~ 55° clear & cool - High today ~ 73°F. Water level in borehole = 12.50+ ft bls.

0715 Calibrating pH Meter using 7.00 & 10.01 buffer solution Slope = 90.7 %.

0720 Airlifting @ 1029 for sample. Meter = 1137854

0730 COND: 2700 µMOHS 1133255

0745 COND: 2980 gal used 4729

0800 COND: 2980 Discharge Rate 40 gpm

0825 COND: 3060 µMOHS 118 minutes.

0840 COND: 3070

0900 COND: 3050

0915 COND 3070

0930 COND: 3030

0945 Collect sample @ 1029' bls. Collect Cl, SO_4, TDS in the Ocala limestone - low porosity.
Temp: 29.5°C COND: 3140 µMHS pH: 7.96
Cl: 980 mg/L SO_4: 350 mg/L

1300 Reach 1049' bls. Meter: 1139964; Airlifting.

1305 COND: 1900 µMOHS 1137984

1320 COND: 3000 µMOHS 1980 gallons

1345 COND 3100 µMOHS Discharge rate = 43 gpm

1400 COND: 3150 µMHS Purge Time 46 minutes

1415 COND: 3160

1430 COND:

1500 Collect STD. COMP. @ 1049' bls.
Temp = 29.5°C COND: 3170 µMOHS pH 8.06
Cl: 1200 mg/L SO_4: 500 mg/L
NOTE: chlorides, sulfate & conductivity increase* @ this point.

1650 Encounter dolomite @ 1055.5' bls. Dolomite is fractured & crystalline - flow from core rods

RCMP 5 Cecil Webb
CORESITE

TED GATES
TUESDAY 11-2-93

has increased. Conductivity = 3200 uMoHS
1720 Collect Cl, SO_4, TDS sample @ 9059'. Cl: 1260
COND: 3370 uMOHS Temp: 29.4°C pH 8.0
NOTE: called Brooksville @ 1700 spoke to D. Raphuhn and informed him of site status.
1740 Leaving site for day.

M. [illegible]
11-2-93

RCMP S

0700
0730
1000
1005
1020
1035
1050
1105
1120
1200
1210
1240
1345
1630
1645
1700
1710
1720
1730
1740

ROMP 5 Cecil Webb — Ted Gates
CORESITE — WEDNESDAY 11-3-93

0700 T. Gates arrives on-site. Water level: 11.75' als.
0730 Calibrating pH Meter using 7.00 & 10.01 buffer solutions. Slope = 92.3%.
1000 Reach 1069' b/s. Begin airlifting. Meter: 1143508
1005 COND: 1460 µmhos — 1139964
1020 COND: 2280 µmhos — Gals. used = 3544
1035 COND: 2790 µmhos — Discharge Rate: 90 gpm
1050 COND: 2920 µmhos — 88 min. purge time.
1105 COND 3080 µmhos
1120 COND: 3190 µmhos
1200 COND: 3340 µmhos
1210 COND: 3370 µmhos
1240 Collect STD. COMP. @ 1069' just below dolomite lens.
Temp: 30.4°C COND: 3420 pH: 8.00
Cl: 1280 mg/l SO4: 400 mg/l
1345 Pat calls in to office in Brooksville.
1630 Reach 1089' stopping to airlift. Meter 1146997
1645 Conduct. — 1143508
1700 CONDUCT: 2610 µmhos — gal. used 3489
1710 COND: 2830 µmhos — Discharge Rate: 60 gpm
1720 COND: 2930 µmhos — Purge Time: 58 min.
NOTE: Called D. Duewitt @ UTOPIA site — spoke to him about the dolomite lenses in the Ocala.
1730 COND: 2970
1740 Collect Cl, SO4, TDS @ 1089' in fractured dolomite.
Temp. 30.0 COND. 3500 pH: 7.85

30

Ramp 5 Cecil Webb — Jel Gates
CORESITE — THURSDAY 11-4-93

0700 T. Gates arrives on-site. Water level in casing - 12.95.

0945 Calibrating pH Meter using 7.00 & 10.01 buffer solution - autocalibration mode. Slope - 91.8 %.

0980 Currently @ 1094' S/S. in dolomite. light brown, hard crystalline, some fractures - possibly Avon Park - but no forams visible yet. Consistent dolomite begins @ 1080.4' S/S.

1030 FORMATION LITHOLOGY FOR CECIL WEBB:

FT BLS	FORMATIONS
0-9 FT	Undifferentiated Surficial Sands
9-49 FT	Caloosahatchie Fm.
49-84 FT	Tamiami Fm
84-128 FT	Venice Clay
84-432 FT	Peace River Fm.
432-508	Undifferentiated Arcadia
508-561.5	Nocatee Member
561.5'-711	Undifferentiated Arcadia
711-989'	Suwannee Fm.
989-1080.4'	Ocala Limestone
1080.4	Avon Park Fm.

1300 T. Gates leaving site - currently in Avon Park? dolomite @ 1105'.

M.T. Hale
11-4-93

ROMP 5 Cecil Webb — T. Gates
CORESITE — MONDAY 11-8-93

1150 T. Gates leaving Brooksville following ROMP Meeting - Pat will core down to 1129' until I arrive on-site.

1445 T. Gates arrives on-site currently @ 1124' bls - formation is calcarenite.

1520 Reach 1129' stopping to airlift. Meter: 1157401

1540 COND: 1140 — 1143508

1600 COND: 2600 — 13,893

1650 COND: 2780 — Discharge Rate = 43 gpm

1710 COND: 2850 — Purge Time: 323 minutes

WATER LEVEL @ 1000 = 12.80' bls

1730 Leaving Site for motel.

~~COND 2840~~

T. Gates
11-8-93

RAMPS Cecil Webb
CORESITE

TED GATES
TUESDAY 8-9-93

0700 T. Gates arrives on-site. Conclude water level = 12.00 ft
Calibrating pH Meter using 7.00 & 10.01 buffer solution Slope = 95.5%
0745 COND: 2840 Resume airlifting @ 1129' b/s.
0800 COND: 2930
0815 COND: 3000
0830 COND: 3020
0845 COND: 3070
0900 COND: 3100
0915 COND: 3120
0930 Collect STD comp. @ 1129' b/s.
COND: 3290 Temp: 30.5C pH 7.75
Cl: 1120 SO4: 360
1200 Ext level on-site. Continue coring in Coarse grained calcarenite of Avon Park
1250 Speak to G. McQuown, D. Rapkin, and J. Decker on the phone. Inform them of site progress.
1530 Reach 1145' stopping to air lift
1540 Cond: 2210 Meter - 1163099
1600 COND: 2420 1157401
1620 COND: 2700 Discharge Rate: 30gpm 5698
1640 COND: 2820 189 minutes
1700 COND: 2890
1715 COND 2940
1730 Leaving site heading for hotel.

m7 Hat

1593

RAMP 5 Cecil Webb — TED GATES
CORESITE — WEDNESDAY 11-10-93

0710 T. Gates arrives on-site - conclude water level = 12.30' a/s. @ 1069' b/s.

0800 Calibrating pH Meter using 7.00 & 10.01 buffer solutions. Slope = 93.5%. Begin airlifting.

0815 COND: 2890

0845 COND: 3050

0900 COND: 3100

0915 COND 3130

0930 COND 3140

0945 COND 3180

1000 Collect Cl, SO_4, TDS sample @ 1169'.
Temp: 30.1 COND: 3200 pH: 7.93
Cl: 1080 mg/l SO_4: 400 mg/l

1230 Reach 1189', stop to airlift. Meter: 1165571
1163 099
2472

1240 COND: 1260 mmohs

Discharge Rate:

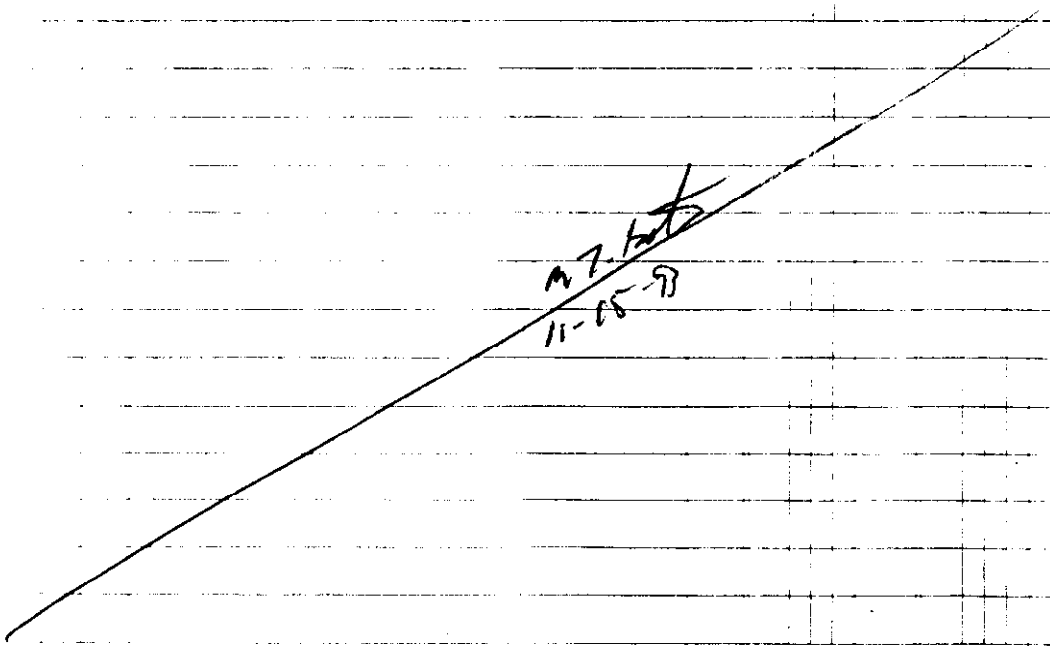
1300 Will not be able to collect sample @ this point due to time restraints - instruct J. Meadors to continue coring to the next sample point - 1209'.

1310 T. Gates leaving site - will stop by the North Part Site.

M. J. Bates
11-10-93

RMP 5 Cecil Webb — Ted Gates
CORESITE — MONDAY 11-15-93

1230 ~~0700~~ T. Gates arrives on-site currently @ 1204' b/s. Water level was 12.30' ds.
1330 Reach 1205' b/s. stopping to airlift.
1340 COND: 2100 — Meter: 1168403
1340 Calibrate pH Meter using 7.00 — 1165571
& 10.01 buffer solutions, — 2832
Slope = 93.2%. — Discharge Rate: 30gpm
1410 COND: 2690 mMOHS — Purge Time: 94 minutes
1440 COND. 3050 mMOHS
1500 COND: 3172 mMOHS
1515 COND: 3210 mMOHS
1530 COND. 3240 mMOHS
1545 Collect STD. COMP. @ 1209' b/s.
TEMP: 30.5°C — Cond. 3270 mMOHS — pH. 7.73
Cl: 1120 mg/L — SO4: 400 mg/L — Density:
1720 Stopping @ 1219' b/s.
1730 Leaving Site for the day - heading to hotel.



ROMPS Cecil Webb — Ted Gates
CORESITE — TUESDAY 11-16-93

0700 T. Gates arrives on-site. Water level in casehole = 12.10' als.
0715 Resume coring from 1219' bls currently in low-porosity calcarenite of Avon Park Formation.
0900 Reach 1229 - decide to core an additional 20' due to the low porosity of calcarenite. Will sample @ 1249' bls.
1030 Airlifting to remove cuttings @ 1239' bls.
1145 Reach 1249' begin airlifting. Formation appears to be fairly tight calcarenite.
1155 COND: 1090 — Meter: 1173604
1215 COND: 1940 — 1168403
1255 COND: 2540 — Discharge Data: 30 — 5201
1330 COND: 2800 — 173 minutes
1400 COND: 2950
1430 COND: 3050
1450 COND: 3090
1515 COND: 3140
1550 Collect Cl, SO_4, TDS sample @ 1249' bls.
TEMP: 30.3°C COND: 3180 umhos pH: 7.71
Cl: 1920 mg/L SO_4: 350 mg/L
1525 Calibrated pH Meter using 7.00 & 10.0 buffer solutions, slope = 93.3%
1700 Reach 1264' stopping to air lift.
1715 P. Meadors calls in to Brooksville office.
1730 Leaving site for day.

M. T. Gates
11-16-93

ROMPS Cecil Webb — Ted Gates
CORESITE — WEDNESDAY 11-17-93

0710 T. Gates arrives on-site. Water level in conduit = 12.35 ' ds.

1030 K. DeGroot leaving site to return to Tampa.

1200 Reach 120.4' stopping to airlift.

1300 Cond. 2000 umohs. Will stop here for lunch before returning to office. I will give P.D. Meador ride back to Tampa.

Gates
11-17-97
core hole
to Tampa
for today
in P.

ROMP 5 Cecil Webb — TED GATES
CORESITE — 11-22-97

1420 T. Gates arrives on-site. ROMP Meeting this morning - it was decided that we will core to 1300' and terminate hole. Will geophysical log hole on Monday.

1430 Pat stated that they began purging core hole @ 1130 this morning.

1431 COND: 3200 u mOHS
Collect SID. comp sample @ 1284' b/s.
TEMP: 29.9°C COND: 3260 pH: 7.86
Cl. 1260 mg/L SO4: 405 mg/L

1450 calibrated pH Meter using 7.00 & 10.01 buffer solution.

1650 Reach 1304' stopping to airlift. Will let hole flow overnight & sample in the morning.

1730 Leaving site for the day.

A. Webb
11-22-97

38 570

ROMP 5 Cecil Webb — Ted Gates
COMPOSITE — TUESDAY 11-23-93

0700 Arrive on-site
0730 Resume air lifting @ 1304' b/s
0745 COND: 2200 mMOHS
0755 COND 2870
0800 Leaving ROMP 5 to load @ Tippen Bay Site
100 Back on-site @ Cecil Webb
1035 COND: 3130
1000 Calibrating pH Meter using 7.00 & 10.01 buffer solution. Refilled w/ fresh solution yesterday. Slope = 88.5 %.
1045 COND: 3310
1100 Collect STD. Comp. @ 1304' b/s.
COND: 3330 TEMP: 29.6° pH: 7.56
Cl: 1240 mg/L SO4:
1215 T. Gates Leaving Site for Brooksville

ROMP 5 Cecil Webb — Ted Gates
CORESITE — MONDAY 11-29-1993

1140 T. Gates, D. Raphun on-site with Geophysical Logging Truck to log the corehole to 1304' bls.

1200 The core rods are @ 1298' bls. We will log through the core rods initially using the slim line tool, then remove the core rods & log using the multi-tool.

1205 Operations personell on-site discussing site plans for Tipper Bay site.

1210 Begin logging using slim-line through core rods.

1400 Complete slim-line through core rods.

1410 K. DeGroat & H. McKinley pulling core rods.

1730 All rods out of hole. Begin logging with caliper tool.

1830 Begin logging again w/ slimline - hung slightly on ledge @ 990' bls.

1930 Begin logging w/ multi-tool.

2100 Complete logging of corehole. Seal off 4" casing and leaving site - will switch vehicles w/ Jim Clayton later returning home.

M. Z
11-29-93