

RADON POTENTIAL STUDY, ALACHUA
COUNTY FLORIDA

E&MS
QE99
.064
no.41

STATE OF FLORIDA
DEPARTMENT OF NATURAL RESOURCES
Tom Gardner, Executive Director

DIVISION OF RESOURCE MANAGEMENT
Jeremy A. Craft, Director

FLORIDA GEOLOGICAL SURVEY
Walter Schmidt, State Geologist and Chief

OPEN FILE REPORT NO. 41

**RADON POTENTIAL STUDY, ALACHUA COUNTY FLORIDA:
NEAR-SURFACE STRATIGRAPHY AND RESULTS OF DRILLING**

By

K. M. Campbell, P.G. #192 and T. M. Scott, P.G. #99

U.S. EPA Contract #68D00097
In cooperation with the United States Geological Survey

FLORIDA GEOLOGICAL SURVEY
TALLAHASSEE, FLORIDA
1991

**RADON POTENTIAL STUDY, ALACHUA COUNTY, FLORIDA:
NEAR-SURFACE STRATIGRAPHY AND RESULTS OF DRILLING**

INTRODUCTION

The concentration of radon in soil gas is primarily dependant on several site specific geologic and hydrologic conditions. These parameters include the concentration of radium in the near surface geologic units, the thickness, lithology and permeability of the geologic units and the elevation of the water table. This U.S. EPA funded study is part of a multidisciplinary project to determine the relationship between the radon source, the characteristics of the overlying sediments, and the radon concentration in the near surface soil gas.

Florida Geological Survey (FGS) geologists met with their USGS counterparts to discuss the geomorphology, stratigraphy and mineralogy of the Alachua County area and its relationship to the occurrence of radon gas. The FGS assisted in site selection and access to state owned lands and provided drilling services, data collection and regional geology expertise. Sites were selected which would represent a variety of geologic and geomorphic conditions (Figure 1).

GEOLOGY

Geomorphology

Alachua County lies partially in the Northern or proximal geomorphic zone and the Central or mid-peninsular zone of White (1970). In general, the Northern zone is characterized by continuous, broad upland areas. The central zone generally consists of discontinuous, subparallel highlands separated by broad

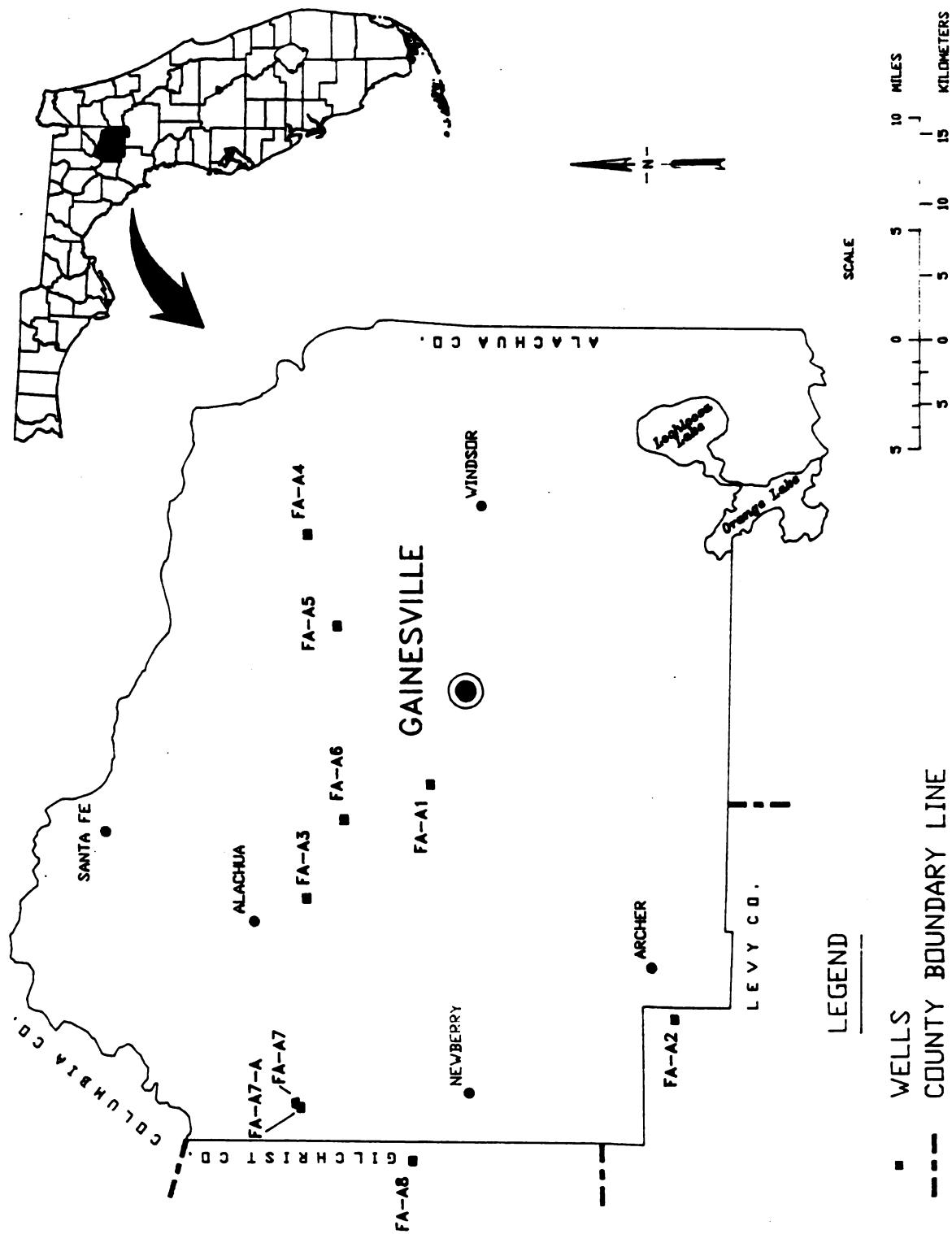


Figure 1: Auger site location map

valleys. The geomorphic features recognized in Alachua County by White (1970) include the Northern Highlands, Western Valley, Alachua Lake Cross Valley, Fairfield Hills, Central Valley and the Brooksville Ridge (Figure 2).

The Northern Highlands cover much of Alachua County (Figure 2). The broad upland area is composed of siliciclastic sediments belonging to the Hawthorn Group, Cypresshead Formation and undifferentiated siliciclastic sediments that are often residuum from the older sediments. Near the western and southern boundaries of the highlands in Alachua County, these sediments are often perforated by karst features. This karstic area was referred to as the Northern Highlands Marginal Zone by Williams et al. (1977) and as the Perforated Zone by Macesich (1988). Elevations in the Northern Highlands of Alachua County range from approximately 100 to 200 feet above mean sea level (MSL). Water-table conditions vary dramatically in the area from well drained in the zone of karst to poorly drained in those areas where impermeable sediments of the Hawthorn Group retard downward movement of the water.

The lower-lying areas bounding the Northern Highlands in the county form part of the Western Valley and Central Valley with the connecting Alachua Lake Cross Valley (Figure 2). In these areas, the karstified Ocala Limestone lies below a variable thickness of undifferentiated siliciclastic sediments and remnants of the Hawthorn Group sediments. Water-table conditions vary from well drained in the highly karstic Western Valley to poorly drained in the Alachua Lake Cross Valley and the northern end of the Central Valley. Elevations in these lower areas range from approximately

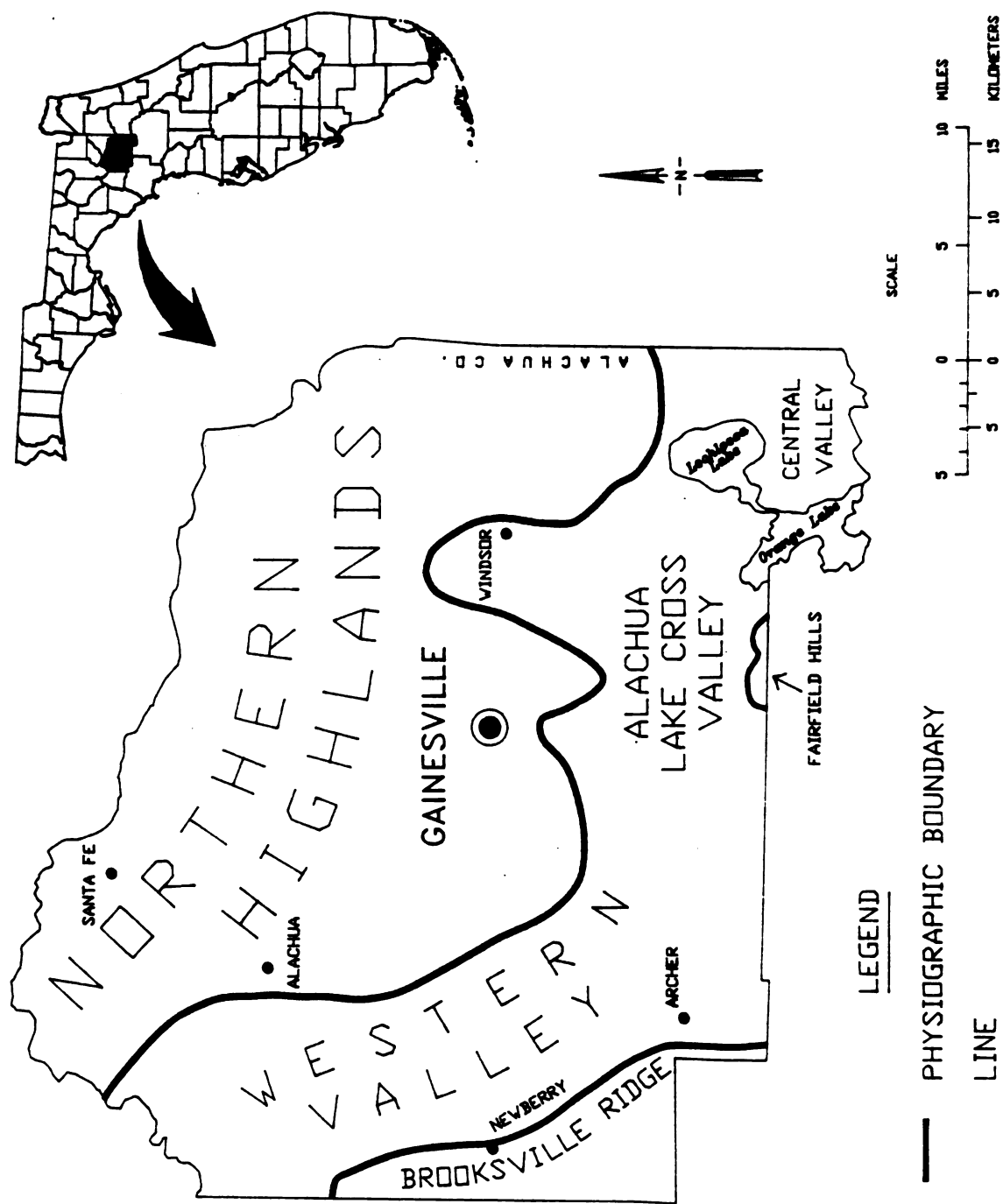


Figure 2: Physiographic Map of Alachua County (After White, 1970)

55 to 125 feet above MSL (Williams et al., 1977).

The Fairfield Hills physiographic feature extends into Alachua County from Marion County to the south (Figure 2). The hills are an irregular erosional outlier of Hawthorn Group sediments and have many characteristics similar to the Northern Highlands transitional zone of Williams et al. (1977). Elevations range from approximately 60 feet MSL to more than 160 feet MSL.

Along the southwestern edge of Alachua County lies the Brooksville Ridge (Figure 2). The ridge is composed of sediments often referred to as the Alachua "Formation" that are in part residual from the Hawthorn Group and in part younger sands. The area is highly karstified and well drained with surface elevations ranging from approximately 55 to 135 feet above MSL (Williams et al., 1977).

Stratigraphy

Ocala Limestone

The oldest sediments exposed or lying near the surface in Alachua County belong to the Ocala Limestone (Figure 3). The Upper Eocene Ocala Limestone is composed of a white to buff colored, fossiliferous packstone to grainstone which ranges from poorly to well indurated. The limestones are characteristically very fossiliferous, containing numerous foraminifers, mollusks and bryozoans. These carbonates contain negligible amounts of siliciclastics and other authigenic minerals. The gamma-ray signature of these sediments is characteristically in the very low range of 10-20 counts per second (CPS) indicating a characteristically low uranium content. The limestones of the Ocala are

UPPER EOCENE	OCALA LIMESTONE
LOWER OLIGOCENE	OUTLIERS AND RESIDUAL SILICIFIED BOULDERS OF SUWANNEE LIMESTONE
MIOCENE	HAWTHORN GROUP (INCLUDING ALACHUA 'FORMATION')
PLIO- PLEISTOCENE	UNDIFFERENTIATED SILICICLASTIC SEDIMENTS

Figure 3: Generalized near-surface
geologic column, Alachua County

not an important source of radon.

The Ocala Limestone forms an important water producing zone in the Floridan aquifer system. This aquifer system provides most of the water for Alachua County.

These sediments are exposed at the surface or covered by a relatively thin veneer of siliciclastics in the Western Valley in western and southwestern Alachua County. Under the Northern Highlands, the Ocala Limestone may occur more than 150 feet below the land surface. In the Western Valley, the Ocala Limestone is unconformably overlain by undifferentiated siliciclastic sediments in most cases. However, in a few areas, remnants of the Hawthorn Group sediments may be encountered. In the Northern Highlands and the Central Valley the Ocala is unconformably overlain by the Hawthorn Group sediments or, in rare instances by erosional outliers of the Suwannee Limestone. On the Brooksville Ridge residual sediments from the Hawthorn Group lie on the Ocala.

The FGS drilling efforts encountered the Ocala Limestone in one hole, FA-A7, at 2.4 feet below land surface. Another hole, FA-A7A, drilled nearby did not encounter the Ocala Limestone. Throughout the area, the top of the Ocala is extremely variable due to karstification and erosion.

Suwannee Limestone

The Oligocene Suwannee Limestone is present in Alachua County as isolated outliers and residual boulders in the northwestern portion of the county (Williams et al., 1977). It is usually found as silicified boulders containing characteristic Suwannee fossils. No Suwannee sediments were encountered during the augering

operations for this project.

Hawthorn Group

The Miocene Hawthorn Group is a complex unit of interbedded and intermixed carbonates and siliciclastics containing widely varying percentages of phosphate grains (Scott, 1988). The percentages of quartz sand, silt, clay and carbonate exhibit a high degree of variability often over short distances both horizontally and vertically. The Hawthorn Group lies unconformably on the Ocala Limestone or, in rare instances, on the isolated outliers of Suwannee Limestone.

The Hawthorn Group in most of northern Florida consists of, in ascending order, the Penney Farms Formation, the Marks Head Formation and the Coosawhatchie Formation. In Alachua County, the component formations of the Hawthorn Group can be recognized in cores in the eastern portion of the county. Toward the western limits of the Hawthorn Group in the county, the sediments grade into an undifferentiated Hawthorn Group section that appears to represent a Gulf coastal facies of the unit. For the purposes of this investigation, the Hawthorn Group was not differentiated into its component formations (Figure 3).

The phosphatic, clayey sediments of the Hawthorn Group occur under the Northern Highlands and the Central Valley in Alachua County. Exposures are limited to karst features and stream valleys. Throughout much of the area it is covered by less than 20 feet of undifferentiated siliciclastic sediments. The top of the group is an erosional unconformity and may exhibit significant localized relief. Two auger holes, encountered Hawthorn Group

sediments, FA-A3 at 6.5 feet and FA-A7A at 14 feet below land surface.

With respect to the radon problem, the phosphatic nature of the Hawthorn Group sediments is a dominant controlling factor. The carbonate fluorapatite mineral francolite occurs throughout these sediments in widely varying proportions and contains variable percentages of uranium. Gamma ray logs of the Hawthorn Group sediments in the Alachua County area reveal readings varying from tens of counts per second (cps) to more than 500 cps in some zones (Scott, 1988). Zellars and Williams (1978) indicate that in the Northern Florida phosphate district, which includes much of Alachua County, the uranium content averages approximately 0.008% (80 ppm).

Sediments previously referred to as the Alachua "Formation" are considered to be residual Hawthorn sediments that have been weathered and reworked and are placed in the Hawthorn Group (see Scott (1988) for a discussion of the Alachua Formation). These sediments often occur as sink hole fill and stream channel fill in the underlying Ocala Limestone. Hard rock phosphate, chert and clay are often mixed in a quartz sand and may contain variable percentages of uranium ranging up to 0.010% (100 ppm) (Zellars and Williams, 1978). Hard rock-bearing sediments were encountered in FA-A7A at 14-18 feet below the surface.

The Hawthorn Group sediments overlie the Floridan aquifer system. These sediments both seal the aquifer system and, in limited areas, form an intermediate aquifer system. Green et al. (1989) describe and characterize these sediments in the Alachua County area.

Undifferentiated siliciclastic sediments

The siliciclastic sediments unconformably overlying the Hawthorn Group or, when the Hawthorn is absent, the Ocala Limestone, are categorized as the "Undifferentiated siliciclastic sediments" due to the paucity of lithologic criteria required to define units (Figure 3). These sediments have been referred to as the "Pleistocene" sands and terrace deposits (Williams et al., 1977). Also incorporated in this unit for this project are the siliciclastics belonging to the Cypresshead Formation (Scott, 1988) which occur along the eastern boundary of Alachua County. The computer-coded well logs refer to these sediments as the undifferentiated sand and clay.

Quartz sands dominate this lithology and contain variable admixtures of clay. The sands range from fine to very coarse and may include some gravel-sized clasts. The sediments range in color from white to reddish orange and are unconsolidated to poorly indurated. Clay beds occur sporadically within these sediments. This unit virtually blankets the entire county ranging from a few feet thick to greater than 20 feet thick. Well FA-A7 encountered only 2.4 feet of the undifferentiated sediments while FA-A8 penetrated 28 feet of it.

The undifferentiated siliciclastic sediments form the surficial aquifer system where they are thick enough and where the permeabilities are sufficient. The water quality is marginal and the aquifer system is not extensively utilized.

METHODS

Nine auger holes were drilled utilizing a Simco 2400 SK auger

rig and 2.5 inch inside diameter hollow stem auger flights. Continuous lithologic samples were collected, beginning at the land surface and continuing to the total depth. Samples were collected through the hollow stem augers utilizing either 2 inch Shelby tube (thin wall) or split spoon samplers. The Shelby tube sampler was either pushed by the rig hydraulics or driven with a 140 pound drop hammer. The split spoon sampler was driven with the drop hammer and was utilized only when conditions precluded sample recovery with the Shelby tube. In order to obtain undisturbed samples, the samples were collected in two foot runs ahead of the auger bit. Retrieved samples were removed from the sample tube, placed in divided core boxes and labeled as to site and depth interval. Once sampling was complete, the hole was refilled with the sediments which were brought to the surface while drilling the hole.

Each site was assigned a FGS well number for inclusion in the statewide well sample archives. The samples from each site were examined with a binocular microscope and the description and formation picks were coded on standardized code sheets for entry into the FGS computerized lithologic log data base. Parameters include lithology, color, porosity types, induration, matrix materials and quantity (%), grain size and range, sorting, accessory minerals, fossils and comments etc. Columnar sections were constructed to accompany the printed lithologic logs.

RESULTS

The nine auger holes drilled for this project ranged from 3.8 to 28 feet deep. The depth of individual holes was determined by a variety of parameters including lithology, depth of water table,

formations encountered and drilling conditions.

W-16649 (FA-A1): The upper 3.8 feet at this site probably consist of fill material (slightly to moderately clayey quartz sand with iron oxide staining, organic material and evidence of moldic porosity).

The clay present in this material allows a perched water table to form. Below the fill material the samples consist of fine grained quartz sand with traces of highly leached phosphate grains and variable quantities of clay, which increase with depth. Samples below the fill material were dry. This site is located along the margin of a closed drainage basin.

W-16650 (FA-A2): The entire drilled interval (23.5 feet) consists of fine grained quartz sand with minor quantities of clay and organic material and traces of heavy minerals. No water was encountered. This site is at the top of a hill adjacent to an active karst feature.

W-16651 (FA-A3): The uppermost sediments (0-6.5 feet) consist of slightly to moderately clayey, medium grained quartz sand. Minor quantities of organic material are present, primarily in the uppermost .5 foot along with occasional fragments of charcoal and phosphatic clay cemented sand. The top of the Hawthorn Group is at 6.5 feet. This material consists of yellowish gray to light olive gray, medium grained quartz sand with variable quantities of clay to variably quartz sandy clays. Both lithologies contain minor quantities of phosphate sand. This is an upland site along the Hawthorn Group outcrop belt.

W-16652 (FA-A4): Samples consist of fine grained quartz sand

with variable quantities of clay matrix. The 8-9 foot interval contains a quartz and phosphatic sandy clay. Due to the high water table and lack of cohesion the sands encountered below the water table flow, causing drilling difficulties. Clay content increases below 10.5 feet.

W-16653 (FA-A5): Samples consist of medium grained quartz sand with variable but generally minor clay matrix and traces of organics and heavy minerals. Below 9.5 feet the sand is fine grained and only slightly clayey. This hole was abandoned at 16 feet due to sand flowing faster than it could be bailed out.

W-16654 (FA-A6): Sediments at this site consist of primarily medium grained quartz sand with generally minor quantities of clay matrix. Minor quantities of organic material are present in the upper portion of the core. These materials are silty and contain trace quantities of heavy minerals. Sand flow problems similar to that at the previous site were encountered but were not as severe.

W-16655 (FA-A7): This site is adjacent to the old (abandoned) Buda Limerock Quarries. The uppermost interval consists of fine grained quartz sand with minor quantities of organic material and heavy minerals. Limestone of the Ocala Limestone was encountered at 2.4 feet. The TD of the hole was at 3.8 feet. No water was encountered.

W-16656 (FA-A7A): Sediments in the interval 0-13.5 feet consist of fine grained quartz sand with minor quantities of organic material and clay. Below 2 feet they also contain scattered granule to gravel sized fragments of well indurated hard rock phosphate. Below 14 feet the sand is significantly more

clayey, is mottled and brecciated in appearance and contains abundant clasts of hard rock phosphate. At 17.8 feet the sediment is phosphate with minor quantities of quartz sand and clay. The sediment is also slightly calcareous. TD is at 18 feet. The interval below 14 feet is interpreted as Hawthorn Group. No water was encountered. This site is at the south edge of an old hardrock phosphate pit.

W-16657 (FA-A8): These sediments consist of fine grained quartz sand with slight quantities of clay matrix. A trace of phosphatic sand is found in the interval .5-3.5 feet. Below 20 feet granule-sized blebs and fragments of well indurated, white, clayey sand is present. No water was encountered. This site is adjacent to an old hardrock phosphate pit. Limestone pinnacles extend essentially to the land surface in some of the pits in the immediate vicinity.

CONCLUSIONS

The sites were selected to represent a variety of geologic and hydrologic conditions. Six of the sites drilled penetrated only sediments assigned to the undifferentiated surficial sands and clays. W-16651 (FA-A3), and W-16656 (FA-A7A) penetrated sediments of the Hawthorn Group, while W-16656 (FA-A7) encountered limestone of the Ocala Limestone at 2.4 feet.

Three sites (FA-A4, FA-A5 and FA-A6) were similar both in general lithology and in having high water tables. These sites are located in regions of the county where the Floridan aquifer system is confined or primarily confined (Macesich, 1988). Sites FA-A1 and FA-A3 are located in Macesich's Perforated Zone (primarily

confined): FA-A1 is located along the flanks of a karst drainage basin (Floridan aquifer system locally unconfined) and the ground-water table was not encountered. Site FA-A3 is located on highlands with significant quantities of clayey sediment to confine the Floridan. The remaining sites are located in areas where the Floridan aquifer system is unconfined. Ground water was not encountered at any of these sites.

REFERENCES

Green, R., Duncan, J., Seal, T., Weinburg, J.M., and Rupert, F., 1989, Characterization of the sediments overlying the Floridan aquifer system in Alachua County, Florida: Florida Geological Survey Open File Report 29, 115 p.

Macesich, M., 1988, Geologic interpretation of the aquifer pollution potential in Alachua County, Florida: Florida Geological Survey Open File Report 21, 25 p.

Scott, T., 1988, The lithostratigraphy of the Hawthorn Group (Miocene) of Florida: Florida Geological Survey Bulletin 59, 148 p.

White, W., 1970, The geomorphology of the Florida peninsula: Florida Bureau of Geology Bulletin 51, 164 p.

Williams, K., Nicol, D. and Randazzo, A., 1977, The geology of the western part of Alachua County, Florida: Florida Bureau of Geology Report of Investigation 85, 98 p.

Zellars, M., and Williams, J., 1978, Evaluation of the phosphate deposits of Florida using the minerals availability system: United States Bureau of Mines Report Contract Number J0377000, 196 p.

APPENDIX

Lithologic logs and stratigraphic columns.

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - SFGS

WELL NUMBER: W- 16649

COUNTY - . ALACHUA

TOTAL DEPTH: 027.5 FT.

LOCATION: T.09S R.19E S.28 D

27 SAMPLES FROM 0 TO 27 FT.

LAT = N 29D 40M 32

LOM = W 82D 24M 41

COMPLETION DATE - 10/51/59

ELEVATION - 125 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

OWNER/DRILLER: UNIV. OF FLA.; DRILLER: FGS

WORKED BY: RICHARD GREEN, KEN CAMPBELL 6/91; --AUGER SITE FA-A1--CONTINUOUS SHELBY
TUBE SAMPLES. 0-3.8' POSSIBLY FILL MATERIAL.

0. - TD. UNDIFFERENTIATED SAND AND CLAY

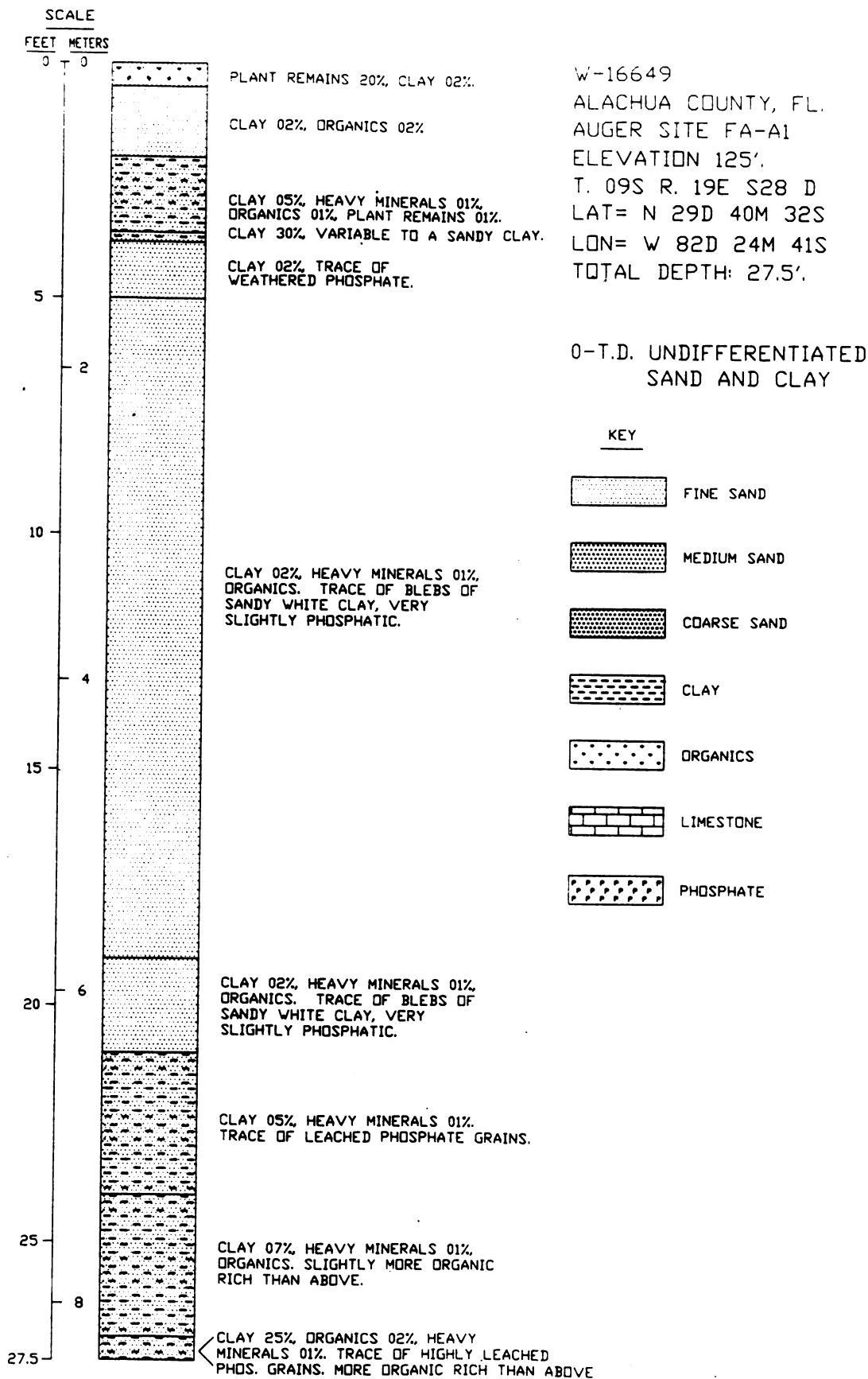
0 - .5 SAND; MODERATE BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
ACCESSORY MINERALS: PLANT REMAINS-20%, CLAY-02%;
ABUNDANT ROOTS.

.5- 2 SAND; DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
ACCESSORY MINERALS: CLAY-02%, ORGANICS-02%;

2 - 3.6 SAND; MODERATE YELLOWISH BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY, PIN POINT VUGS;
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
ACCESSORY MINERALS: PLANT REMAINS-01%, CLAY-05%, ORGANICS-01%, HEAVY MINERALS-01%;
POSSIBLY MOLDIC; BLEBS AND GRAINS WITH IRON OXIDE CEMENT COATINGS AND BLEBS WITH ORGANIC
MATRIX.

3.6- 3.8 SAND; YELLOWISH GRAY TO VERY LIGHT ORANGE; INTERGRANULAR, LOW PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-30%;
IRON OXIDE STAINING, VARIABLE TO A SANDY CLAY. CLAYEY ZONE WITH PLANT FRAGMENTS AT BASE.
MOTTLED CLAYEY AND SANDY ZONES.

- 3.8- 5 SAND; DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-02%;
CLAY PRIMARILY AS GRAIN COATINGS. TRACE OF FINE-MED, VERY WEATHERED PHOSPHATE GRAINS
(CREAM-EARTHY WHITE).
- 5 - 19 SAND; MODERATE GRAY TO MODERATE DARK GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-02%, ORGANICS- %, HEAVY MINERALS-01%;
MINOR (1%), SCATTERED BLEBS OF SAND WITH WHITE CLAY MATRIX WHITE CLAY IS VERY SLIGHTLY
PHOSPHATIC. FROM 10-19'.
- 19 - 21 SAND; GRAYISH BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-02%, ORGANICS- %, HEAVY MINERALS-01%;
TRACE OF BLEBS OF SANDY WHITE CLAY, V. SLIGHTLY PHOSPHATIC.
- 21 - 24 SAND; DARK BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-05%, HEAVY MINERALS-01%;
TRACE OF LEACHED PHOSPHATE GRAINS.
- 24 - 27 SAND; DARK BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
ACCESSORY MINERALS: CLAY-07%, ORGANICS- %, HEAVY MINERALS-01%;
SLIGHTLY MORE ORGANIC RICH THAN ABOVE.
- 27 - 27.5 SAND; ; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: VERY FINE TO COARSE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-25%, ORGANICS-02%, HEAVY MINERALS-01%;
INTERVAL IS OLIVE BLACK TO BROWNISH BLACK IN COLOR. MORE ORGANIC RICH THAN ABOVE. TRACE OF
HIGHLY LEACHED PHOS. GRNS.
- 27.5 TOTAL DEPTH



LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16650

COUNTY - LEVY

TOTAL DEPTH: 23.5. FT.

LOCATION: T.11S R.17E S.13 D

23 SAMPLES FROM 0 TO 24 FT.

LAT = N 29D 31M 36

LOM = W 82D 33M 42

COMPLETION DATE - 05/15/91

ELEVATION - 090 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

OWNER/DRILLER: OWNER: MR. DAVE HINTENLANG; DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91; --AUGER SITE FA-A2--, LEVY COUNTY.
CONTINUOUS SHELBY TUBE SAMPLES.

0. - . UNDIFFERENTIATED SAND AND CLAY

0 - 1 SAND; OLIVE GRAY TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: ORGANICS-05%;
ROOTS PRESENT.

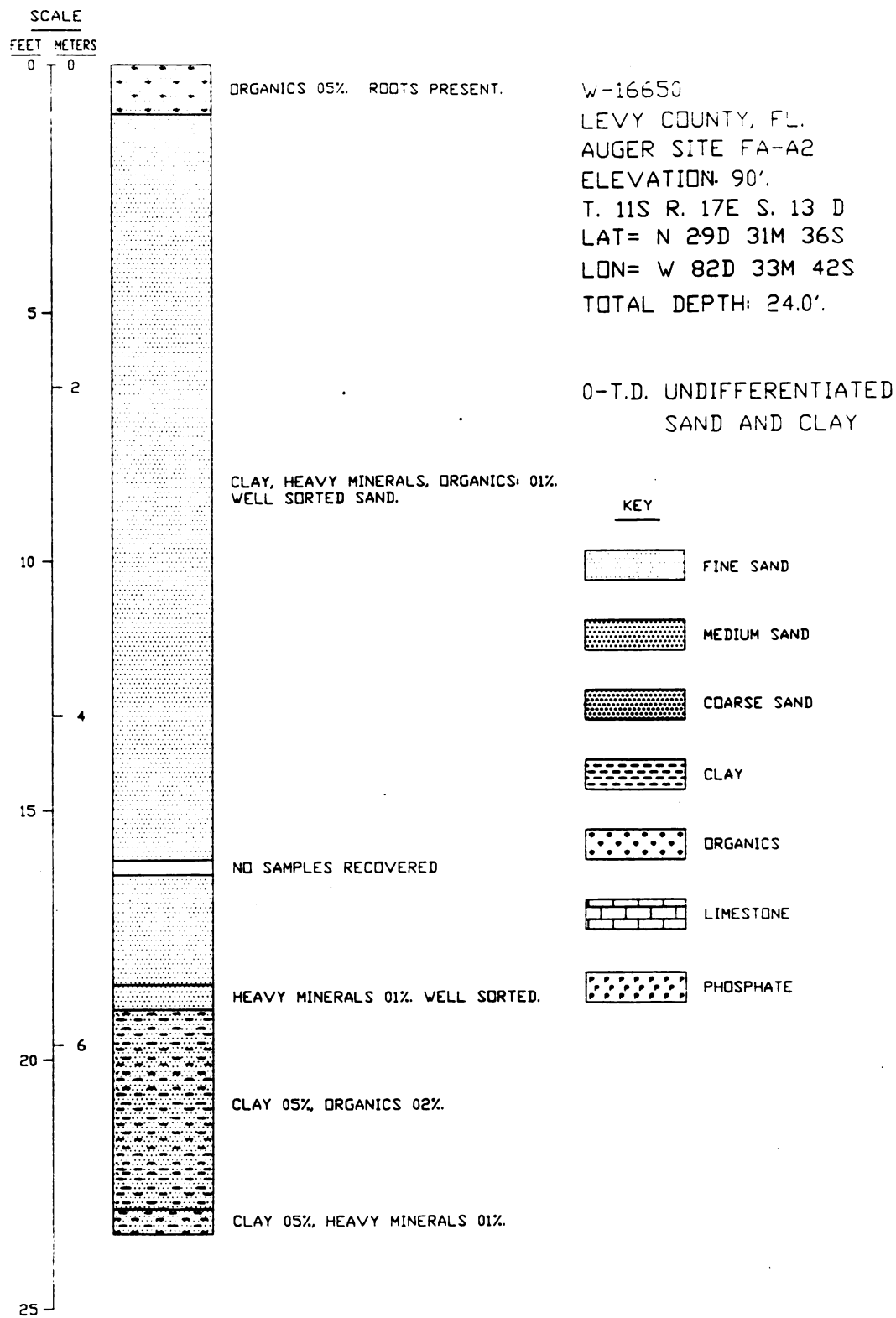
1 - 16 SAND; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%, CLAY-01%, ORGANICS-01%;
WELL SORTED SAND. THIN BED AT 14' W/ 5% WHITE CLAY MATRIX.

16 - 16.3 SAND; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-01%, HEAVY MINERALS-01%;
3" RECOVERY 16-18'. UNCONSOLIDATED TO V. POORLY INDURATED.

16.3- 18.5 NO SAMPLES

18.5- 19 SAND; VERY LIGHT ORANGE TO TRANSPARENT; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%;
CLEAN QTZ SAND, WELL SORTED- V. PALE YELLOW-ORANGE TO CLEAR.

- 19 - 23 SAND; GRAYISH BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-05%, ORGANICS-02%;
SLIGHTLY MORE ORGANICS AND CLAY FROM 19.5-20' AND 21-23.5'. FAINT BEDDING (INCLINED) AT
20'.--THIN CLAY LAMINAE.
- 23 - 23.5 SAND; GRAYISH BROWN TO MODERATE BROWN; INTERGRANULAR; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-05%, HEAVY MINERALS-01%;
CENTER OF CORE HAS MOD. BRN CLAY MATRIX.
- 23.5 TOTAL DEPTH



LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16651

COUNTY - ALACHUA

TOTAL DEPTH: 00020 FT.

LOCATION: T.08S R.18E S.35

20 SAMPLES FROM 0 TO 20 FT.

LAT = N 29D 44M 50

LOM = W 82D 28M 37

COMPLETION DATE - 05/15/91

ELEVATION - 168 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

OWNER/DRILLER: OWNER: SAN FELASCO HAMMOCK STATE PRESERVE; DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91. --AUGER SITE FA-A3--; LOCATED IN
EASTERN 1/2 OF IRREGULAR SECTION 35. CONTINUOUS SHELBY TUBE SAMPLES.

0. - 6.5 UNDIFFERENTIATED SAND AND CLAY

6.5- TD. HAWTHORN GROUP

0 - .5 SAND; DARK BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;

GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM;

ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;

CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;

ACCESSORY MINERALS: CLAY-05%, ORGANICS-05%, PLANT REMAINS-15%;

ABUNDANT ROOTS.

.5- 5 SAND; GRAYISH BROWN TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;

GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;

ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;

CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;

ACCESSORY MINERALS: CLAY-07%, ORGANICS-01%;

OCCASIONAL FRAGMENTS PHOS. CLAY CEMENTED SAND, OCCASIONAL FRAGMENTS OF CHARCOAL.

5 - 6.5 SAND; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY;

GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;

ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;

CEMENT TYPE(S): CLAY MATRIX;

ACCESSORY MINERALS: CLAY-20%, HEAVY MINERALS-01%;

CLAY CONTENT RANGES 30-15% AND DECREASES WITH DEPTH.

6.5- 9 SAND; YELLOWISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY;

GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;

ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;

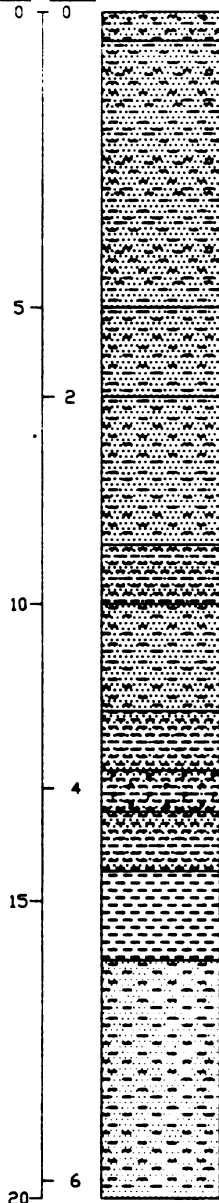
CEMENT TYPE(S): CLAY MATRIX;

ACCESSORY MINERALS: HEAVY MINERALS-01%, CLAY-25%;

CLAY CONTENT VARIABLE 10-50%, VARIABLE TO A VERY SANDY CLAY. CLAY REACTS V. SLIGHTLY TO
PHOS. INDICATOR. TRACE OF HIGHLY LEACHED PHOSPHATE SAND.

- 9 - 10 CLAY; YELLOWISH GRAY TO LIGHT OLIVE GRAY; LOW PERMEABILITY, INTERGRANULAR; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-15%, PHOSPHATIC SAND-01%;
OTHER FEATURES: PLASTIC;
VARIABLE SAND CONTENT (10-30%).
- 10 - 11.8 SAND; YELLOWISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-20%, CLAY-40%, PHOSPHATIC SAND-01%;
OTHER FEATURES: PLASTIC, WEATHERED;
BLEBS YELLOW ORANGE SANDY CLAY, INTERVAL FLOWED IN CORE TRAY.
- 11.8- 12.8 AS ABOVE
CLAY AS ABOVE BUT FIRMER- PLASTIC, COHESIVE. RETAINED CORE SHAPE. VARIABLE TO CLAYEY SAND.
SAND 25%, HEAVIES 01%, PHOS. SAND 01%.
- 12.8- 13.5 CLAY; YELLOWISH GRAY TO GREENISH GRAY; LOW PERMEABILITY, INTERGRANULAR; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-05%, HEAVY MINERALS-01%;
PHOSPHATE IS HIGHLY LEACHED.
- 13.5- 14.5 CLAY; YELLOWISH GRAY TO GREENISH GRAY; LOW PERMEABILITY, INTERGRANULAR; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-03%, IRON STAIN-01%, SILT- %, PHOSPHATIC SAND-03%;
OTHER FEATURES: WEATHERED;
HIGHLY VARIABLE SAND, SILT CONTENT. MOTTLED WITH IRON STAINS AND SANDY BLEBS. CONSISTS OF
GREENISH CLAY WITH VARIABLE SAND CONTENT. PHOS. SAND IS HIGHLY LEACHED. IRON STAIN ON
OUTSIDE OF CORE DUE TO SAMPLE LEFT IN SHELBY TUBE.
- 14.5- 16 CLAY; MODERATE GRAYISH GREEN TO LIGHT OLIVE BROWN; LOW PERMEABILITY, INTERGRANULAR;
POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: IRON STAIN-01%, QUARTZ SAND-02%, PHOSPHATIC SAND-02%;
MOTTLED WITH CLAY AND IRON STAINS. IRON STAIN SEEMS TO FOLLOW THE SANDIER LAYERS. MINOR
SAND IN CLAYS. TRACE OF SULFIDES ORGANIC RICH CLAY AT 15.9'. VARIABLE SAND AND SILT.
LEACHED PHOS. SAND ASSOCIATED W/ SANDY LAYERS. CLAY IS WAXY.
- 16 - 20 SAND; YELLOWISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-10%, CLAY-35%, PHOSPHATIC SAND-01%;
VARIABLE CLAY CONTENT- SAMPLE STILL WET AND VERY STICKY AND PLASTIC. CLAY INCREASES WITH
DEPTH TO A SANDY CLAY.
- 20 TOTAL DEPTH

SCALE
FEET METERS
0 0



CLAY 05%, ORGANICS 05%,
PLANT REMAINS 15%.

CLAY 07%, ORGANICS 01%,
TR. PHOSPHATIC CLAY
CEMENTED SAND.

CLAY 30-15%, AVG. 20%,
DECREASE W/ DEPTH. HEAVY
MINERALS 01%.

CLAY 10-50%, AVG 25%,
VARIABLE TO V. SANDY CLAY.
TR. LEACHED PHOS. SAND.
HEAVY MINERALS 01%.

SAND 15%, PHOS. SAND 01%,
QTZ SAND VARIABLE 10-30%.

CLAY 20-40%, PHOS. SAND 01%.
PLASTIC, WEATHERED.

SAND 25%, HEAVY MINERALS
01%, PHOS. SAND 01%.

QTZ SAND 05%, HEAVY MINERALS
01%, LEACHED PHOS. SAND 05%.

QTZ SAND 03%, SILT, IRON STAIN
01%, LEACHED PHOS. SAND 03%.

QTZ SAND 02%, LEACHED PHOS.
SAND 02%, IRON STAIN 01%

VARIABLE CLAY 10-35%,
PHOSPHATE SAND 01%
CLAY INCREASES WITH DEPTH
TO A SANDY CLAY.

W-16651

ALACHUA COUNTY, FL.

AUGER SITE FA-A3

ELEVATION 168'.

T. 08S R. 18E S. 35

LAT= N 29D 44M 50S

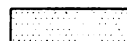
LOD= W 82D 28M 37S

TOTAL DEPTH: 20.0'.

0-6.5' UNDIFFERENTIATED
SAND AND CLAY

6.5'-T.D. HAWTHORN GROUP

KEY



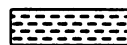
FINE SAND



MEDIUM SAND



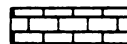
COARSE SAND



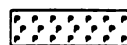
CLAY



ORGANICS



LIMESTONE



PHOSPHATE

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16652

COUNTY - ALACHUA

TOTAL DEPTH: 00014 FT.

LOCATION: T.08S R.21E S.33DA

14 SAMPLES FROM 0 TO 14 FT.

LAT = N 29D 45M 25

LOM = W 82D 12M 29

COMPLETION DATE - 05/16/91

ELEVATION - 152 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

OWNER/DRILLER: OWNER: UNIV. OF FLA, AUSTIN CARY FOREST; DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91. --AUGER SITE FA-A4--; CONTINUOUS
SHELBY TUBE/ SPLIT SPOON SAMPLES.

0. - TD. UNDIFFERENTIATED SAND AND CLAY

0 - 4 SAND; LIGHT GRAY TO MODERATE GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): ORGANIC MATRIX;
ACCESSORY MINERALS: PLANT REMAINS-05%, HEAVY MINERALS-01%;
PLANT FRAGMENT AND ROOTS AT 0-0.5'. ORGANICS AND TRACE OF CLAY AT 3'. SCATTERING OF
COARSE-V.C. GRAINS. NO TO POOR INDURATION.

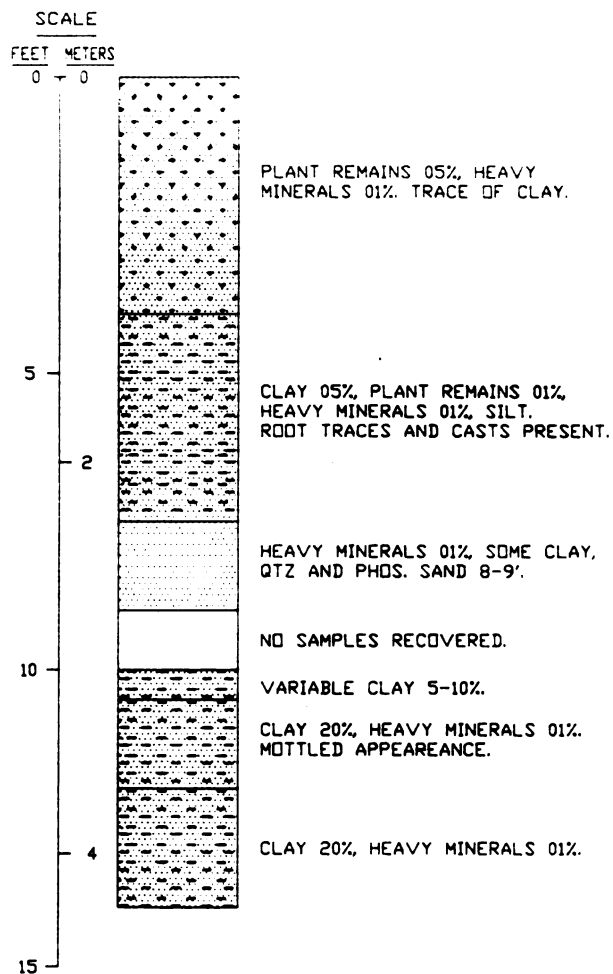
4 - 7.5 SAND; GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-05%, PLANT REMAINS-01%, SILT- %, HEAVY MINERALS-01%;
ROOT TRACES AND CASTS PRESENT.

7.5- 9 SAND; VERY LIGHT ORANGE TO WHITE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%;
8-9' INTERVAL ALSO CONTAINS LT OLIVE-DUSKY YELLOW CLAY- QTZ AND PHOS. SANDY, HOWEVER
SAMPLE IS SMEARED UP ALONG INSIDE OF SPLIT SPOON SAMPLE, THEREFORE DEPTH INTERVAL IS
UNCLEAR.

9 - 10 NO SAMPLES

10 - 10.5 SAND; GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-05%, CLAY-10%;

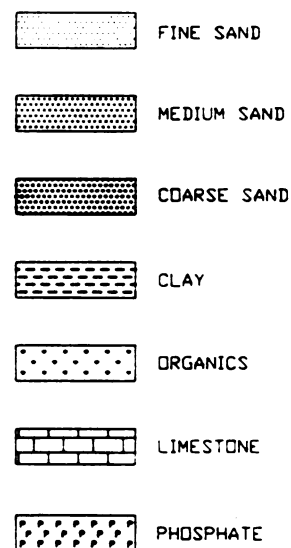
- 10.5- 12 SAND; GRAYISH BROWN TO WHITE;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ROUNDED; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-20%, HEAVY MINERALS-01%;
COLOR RANGES TO PALE BROWN TOWARDS BASE. POOR-MOD. INDURATION. MOTTLED APPEAREANCE. MINOR
CLAY MATRIX. (MOTTLED TAN- BROWN-LT GRAY).
- 12 - 14 SAND; VERY LIGHT GRAY TO YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-20%, HEAVY MINERALS-01%;
- 14 TOTAL DEPTH



W-16652
ALACHUA COUNTY, FL.
AUGER SITE FA-A4
ELEVATION 152'.
T. 08S R. 21E S. 33 DA
LAT= N 29D 45M 25S
LON= W 82D 12M 29S
TOTAL DEPTH: 14.0'.

0-T.D. UNDIFFERENTIATED
SAND AND CLAY

KEY



LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16653

COUNTY - ALACHUA

TOTAL DEPTH: 00016 FT.

LOCATION: T.09S R.20E S.021R

16 SAMPLES FROM 0 TO 16 FT.

LAT = N 29D 43M 56

LOH = W 82D 16M 35

COMPLETION DATE - 05/17/91

ELEVATION - 142 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

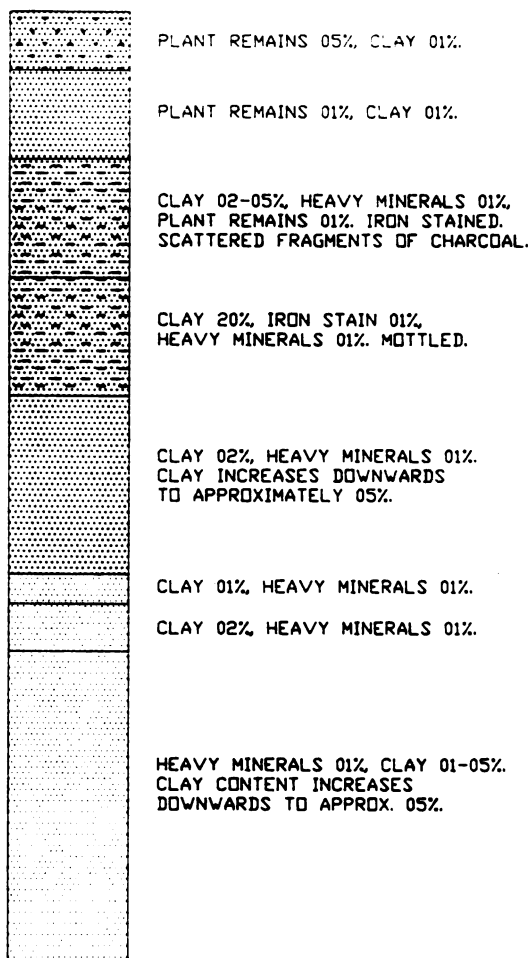
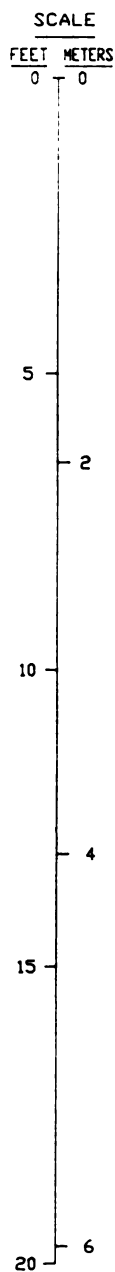
OWNER/DRILLER: OWNER: UNIV. OF FLA., BEEF RESEARCH UNIT. DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91; --AUGER SITE FA-A5--
CONTINUOUS SHELBY TUBE SAMPLES.

0. - TD. UNDIFFERENTIATED SAND AND CLAY

- 0 - 1 SAND; DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: PLANT REMAINS-05%, CLAY-01%;
UNCONSOLIDATED TO POORLY INDURATED.
- 1 - 2.5 SAND; GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: PLANT REMAINS-01%, CLAY-01%;
- 2.5- 4.5 SAND; DARK YELLOWISH BROWN TO MODERATE YELLOWISH BROWN; INTERGRANULAR;
GRAIN SIZE: MEDIUM; RANGE: MEDIUM TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-02%, CLAY-05%, HEAVY MINERALS-01%, PLANT REMAINS-01%;
SCATTERED FRAGMENTS OF CHARCOAL. VARIABLE CLAY CONTENT (IRON STAINED); MINOR ROOTLETS.
MORE IRON-STAINED CLAY AT 3.25-3.75'. VARIABLE PERMEABILITY.
- 4.5- 6.5 SAND; LIGHT BROWN; INTERGRANULAR, LOW PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-20%, IRON STAIN-01%, HEAVY MINERALS-01%;
ORANGISH BROWN CLAY MATRIX AND LT GRAY CLAY MATRIX. VARIABLE % OF ORANGE VS. GRAY CLAY.
ORANGE CLAY DOMINANT 4.5-5.5', 50/50 MIX 5.5-6.5'. TRACE OF HEAVIES.

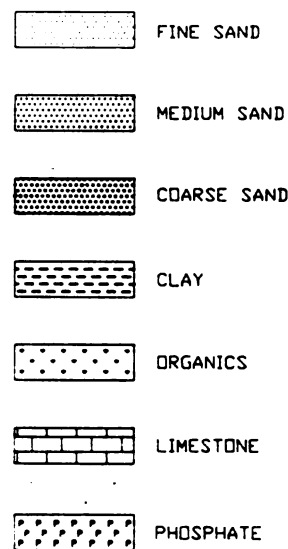
- 6.5- 9.5 SAND; LIGHT YELLOWISH ORANGE TO DARK YELLOWISH ORANGE; POSSIBLY HIGH PERMEABILITY, INTERGRANULAR;
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-02%, HEAVY MINERALS-01%;
CLAY CONTENT INCREASES DOWNWARDS TO APPROX. 5%.
- 9.5- 10 SAND; WHITE TO GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: CLAY-01%, HEAVY MINERALS-01%;
VARIABLE CLAY CONTENT 0-1%. SHEATH OF BROWNISH CLAYEY SAND AROUND INTERVAL 10-11'--CAUSED BY DRILLING.
- 10 - 10.8 SAND; GRAYISH ORANGE TO LIGHT YELLOWISH ORANGE;
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: SUB-ROUNDED; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-02%, HEAVY MINERALS-01%;
UNCONSOLIDATED TO POORLY INDURATED.
- 10.8- 16 SAND; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%, CLAY-01%, CLAY-05%;
MASSIVE SAND. CLAY CONTENT INCREASES DOWNWARDS TO APPROX. 5%.
- 16 TOTAL DEPTH



W-16653
ALACHUA COUNTY, FL.
AUGER SITE FA-A5
ELEVATION 142'.
T. 09S R. 20E S. 02 IRR
LAT= N 29D 43M 56S
LON= W 82D 16M 35S
TOTAL DEPTH: 16.0'.

0-T.D. UNDIFFERENTIATED
SAND AND CLAY

KEY



LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16654

COUNTY - ALACHUA

TOTAL DEPTH: 00020 FT.

LOCATION: T.09S R.19E S.09AA

20 SAMPLES FROM 0 TO 20 FT.

LAT = N 29D 43M 50

LOX = W 82D 25M 11

COMPLETION DATE - 05/17/91

ELEVATION - 170 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

OWNER/DRILLER: OWNER: UNIV. OF FLA, AGRICULTURE EXP. STATION; DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91; --AUGER SITE FA-A6--.

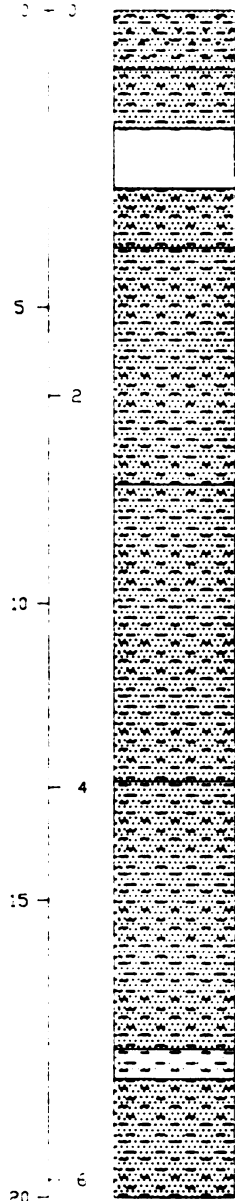
CONTINUOUS SHELBY TUBE AND SPLIT SPOON SAMPLES.

0. - TD. UNDIFFERENTIATED SAND AND CLAY

- 0 - 1 SAND; DARK YELLOWISH BROWN; INTERGRAMULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: ORGANICS-03%, PLANT REMAINS-05%, SILT- %, CLAY-05%;
ROOTS. ORGANICS DECREASE DOWNWARDS.
- 1 - 2 SAND; DARK YELLOWISH BROWN; INTERGRAMULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: ORGANICS-02%, PLANT REMAINS-01%, SILT- %, CLAY-05%;
- 2 - 3 NO SAMPLES
- 3 - 4 SAND; DARK YELLOWISH BROWN; INTERGRAMULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: ORGANICS-01%, PLANT REMAINS-01%, SILT- %, CLAY-05%;
- 4 - 8 SAND; VERY LIGHT GRAY TO YELLOWISH GRAY; INTERGRAMULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-05%, CLAY-10%, HEAVY MINERALS-01%;
- 8 - 13 SAND; DARK YELLOWISH BROWN; INTERGRAMULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-10%, SILT-%;

- 13 - 17.5 SAND; DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: ORGANICS-01%, CLAY-10%, SILT- %, HEAVY MINERALS-01%;
SLOW DECREASE IN MATRIX WITH DEPTH.
- 17.5- 18 SAND; VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-08%, HEAVY MINERALS-01%;
- 18 - 20 SAND; VERY LIGHT GRAY TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO MEDIUM;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-02%, CLAY-05%, HEAVY MINERALS-01%;
- 20 TOTAL DEPTH

SCALE
FEET METERS
0 - 0



ORGANICS 03%, PLANT REMAINS 05%,
CLAY 05%, SILT. ORGANICS DECREASE
DOWNWARDS.

ORGANICS 02%, PLANT REMAINS 01%,
CLAY 05%, SILT.

NO SAMPLES RECOVERED.

ORGANICS 01%, PLANT REMAINS 01%,
CLAY 05%, SILT.

CLAY 05-10%, HEAVY MINERALS 01%.

CLAY 10%, SILT.

CLAY 10%, HEAVY MINERALS 01%,
ORGANICS 01%, SILT. SLOW
DECREASE IN MATRIX WITH DEPTH.

CLAY 08%, HEAVY MINERALS 01%.

CLAY 02-05%, HEAVY MINERALS 01%.

X-15654

ALACHUA COUNTY, FL.

AUGER SITE FA-A6

ELEVATION 170'.

T. 09S R. 19E S. 09 AA

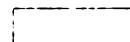
LAT= N 29D 43M 50S

LOD= W 82D 25M 11S

TOTAL DEPTH: 20.0'.

0-T.D. UNDIFFERENTIATED
SAND AND CLAY

KEY



FINE SAND



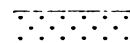
MEDIUM SAND



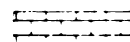
COARSE SAND



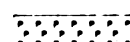
CLAY



ORGANICS



LIMESTONE



PHOSPHATE

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16655

COUNTY - ALACHUA

TOTAL DEPTH: 003.8 FT.

LOCATION: T.08S R.17E S.29CD

4 SAMPLES FROM 0 TO 4 FT.

LAT = N 29D 45M 22

LOH = W 82D 37M 54

COMPLETION DATE - 05/28/91

ELEVATION - 075 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

OWNER/DRILLER: OWNER: LONCALA PHOSPHATE CO.; DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91; LOCATED ON SOUTH LINE OF SECTION 29, CCD. --AUGER SITE FA-A7--SHELBY TUBE SAMPLES.

0. - 2.4 UNDIFFERENTIATED SAND AND CLAY

2.4- TD. OCALA GROUP

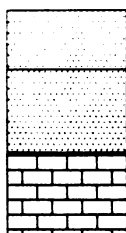
0 - 1 SAND; MODERATE GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX;
ACCESSORY MINERALS: ORGANICS-02%, PLANT REMAINS-03%;
UNCONSOLIDATED TO POORLY INDURATED.

1 - 2.4 SAND; GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%, ORGANICS-01%;
UNCONSOLIDATED TO POORLY INDURATED.

2.4- 3.8 LIMESTONE; WHITE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, INTRAGRANULAR;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE; 70% ALLOCHEMICAL CONSTITUENTS;
GRAIN SIZE: MEDIUM; RANGE: MICROCRYSTALLINE TO MEDIUM; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: PLANT REMAINS-01%;
OTHER FEATURES: WEATHERED;
FOSSILS: BENTHIC FORAMINIFERA;
MUMMULITES, LEPIDOCYCLINA SP. NOTED; PUNKY, WEATHERED LS. ABUNDANT SMALL FORAMS.

3.8 TOTAL DEPTH

SCALE
FEET METERS
0 0



ORGANICS 02%, PLANT REMAINS 03%.

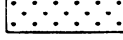
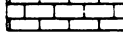
HEAVY MINERALS 01%, ORGANICS 01%.

PLANT REMAINS 01%. NUMMULITES,
LEPIDOCYCLINA SP. NOTED.
PUNKY, WEATHERED LIMESTONE.

W-16655
ALACHUA COUNTY, FL.
AUGER SITE FA-A7
ELEVATION 75'.
T. 08S R. 17E S. 29 CD
LAT= N 29D 45M 22S
LON= W 82D 37M 54S
TOTAL DEPTH: 3.8'.

0-2.4' UNDIFFERENTIATED
SAND AND CLAY
2.4'-T.D. OCALA GROUP

KEY

-  FINE SAND
-  MEDIUM SAND
-  COARSE SAND
-  CLAY
-  ORGANICS
-  LIMESTONE
-  PHOSPHATE

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16656

COUNTY - ALACHUA

TOTAL DEPTH: 00018 FT.

LOCATION: T.08S R.17E S.32DA

18 SAMPLES FROM 0 TO 18 FT.

LAT = N 29D 45M 06

LOH = W 82D 38M 10

COMPLETION DATE - 05/28/91

ELEVATION - 080 FT

OTHER TYPES OF LOGS AVAILABLE - NONE

OWNER/DRILLER: OWNER: LONCALA PHOSPHATE CO.; DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91; --AUGER SITE FA-A7A--

CONTINUOUS SHELBY TUBE SAMPLES.

0. - TD. UNDIFFERENTIATED SAND AND CLAY

0 - 1 SAND; DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: ORGANICS-02%, PLANT REMAINS-02%, CLAY-03%;

1 - 2 SAND; GRAYISH BROWN TO LIGHT GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
CEMENT TYPE(S): ORGANIC MATRIX, CLAY MATRIX;
ACCESSORY MINERALS: ORGANICS-01%, PLANT REMAINS-01%;

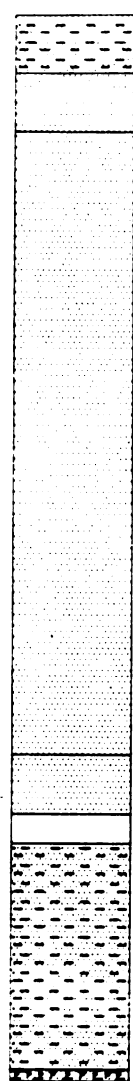
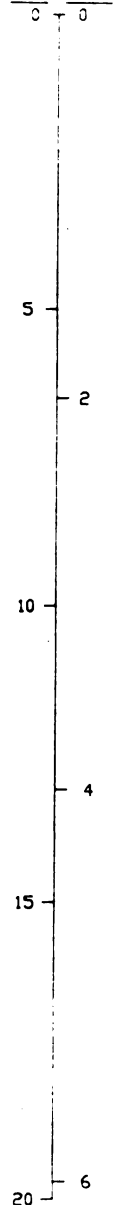
2 - 12.5 SAND; GRAYISH ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: IRON STAIN- %, CLAY-02%, HEAVY MINERALS-01%;
WELL SORTED, OCCASIONAL ROOTS. UNCONSOLIDATED TO POORLY INDURATED. SCATTERED GRANULE TO GRAVEL SIZED FRAGMENTS OF WELL INDURATED HARD ROCK PHOSPHATE.

12.5- 13.5 SAND; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%;
AS ABOVE W/O IRON STAIN.

13.5- 14 NO SAMPLES

- 14 - 17.8 SAND; GRAYISH BROWN TO WHITE; INTERGRANULAR, LOW PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, BRECCIATED,
ACCESSORY MINERALS: CLAY-05%, CLAY-15%, HEAVY MINERALS-01%, IRON STAIN- %;
OTHER FEATURES: CALCAREOUS, WEATHERED;
MOTTLED AND BRECCIATED APPEARANCE. ABUNDANT CLASTS OF WHITE HARD ROCK PHOSPHATE, SINKHOLE
FILLING. VARIABLE CLAY CONTENT AND IRON STAIN. SEEMS TO BECOME MORE PHOSPHATIC WITH DEPTH.
15-30% HARD ROCK PHOSPHATE.
- 17.8- 18 PHOSPHATE; WHITE TO YELLOWISH GRAY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-10%, CLAY-05%;
PHOSPHATE AND CLAY MATRIX. OVERALL TEXTURE CRUMBLY. SLIGHTLY CALCAREOUS CLAYEY SAND MATRIX
SEPARATES GRAVEL SIZED FRAGMENTS OF HARD ROCK PHOSPHATE.
- 18 TOTAL DEPTH

SCALE
FEET METERS



ORGANICS 02%, CLAY 03%,
PLANT REMAINS 02%.

ORGANICS 01%, PLANT
REMAINS 01%.

WELL SORTED. OCCASIONAL ROOTS.
CLAY 02%, HEAVY MINERALS 01%,
IRON STAIN. SCATTERED GRANULE
TO GRAVEL SIZED FRAGMENTS OF
WELL INDURATED HARD ROCK
PHOSPHATE.

HEAVY MINERALS 01%.
AS ABOVE WITHOUT IRON STAIN.
NO SAMPLES RECOVERED.

CLAY 05-15%, HEAVY
MINERALS 01%, IRON STAIN.
ABUNDANT CLASTS OF HARD
ROCK PHOSPHATE (15-30%)
WEATHERED.

QTZ SAND 10%, CLAY 05%. GRAVEL
SIZED FRAGMENTS OF HARD ROCK
PHOS. IN SAND AND CLAY MATRIX.

W-16656

ALACHUA COUNTY, FL.

AUGER SITE FA-A7A

ELEVATION 80'.

T. 08S R. 17E S. 32 DA

LAT= N 29D 45M 06S

LON= W 82D 38M 10S

TOTAL DEPTH: 18.0'.

0-14' UNDIFFERENTIATED
SAND AND CLAY
14'-T.D. HAWTHORN GROUP

KEY

	FINE SAND
	MEDIUM SAND
	COARSE SAND
	CLAY
	ORGANICS
	LIMESTONE
	PHOSPHATE

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16657
TOTAL DEPTH: 00028 FT.
28 SAMPLES FROM 0 TO 28 FT.

COUNTY - GILCHRIST
LOCATION: T.09S R.16E S.24CD
LAT = N 29D 41M 05
LON = W 82D 39M 53

COMPLETION DATE - 05/29/91
OTHER TYPES OF LOGS AVAILABLE - NONE

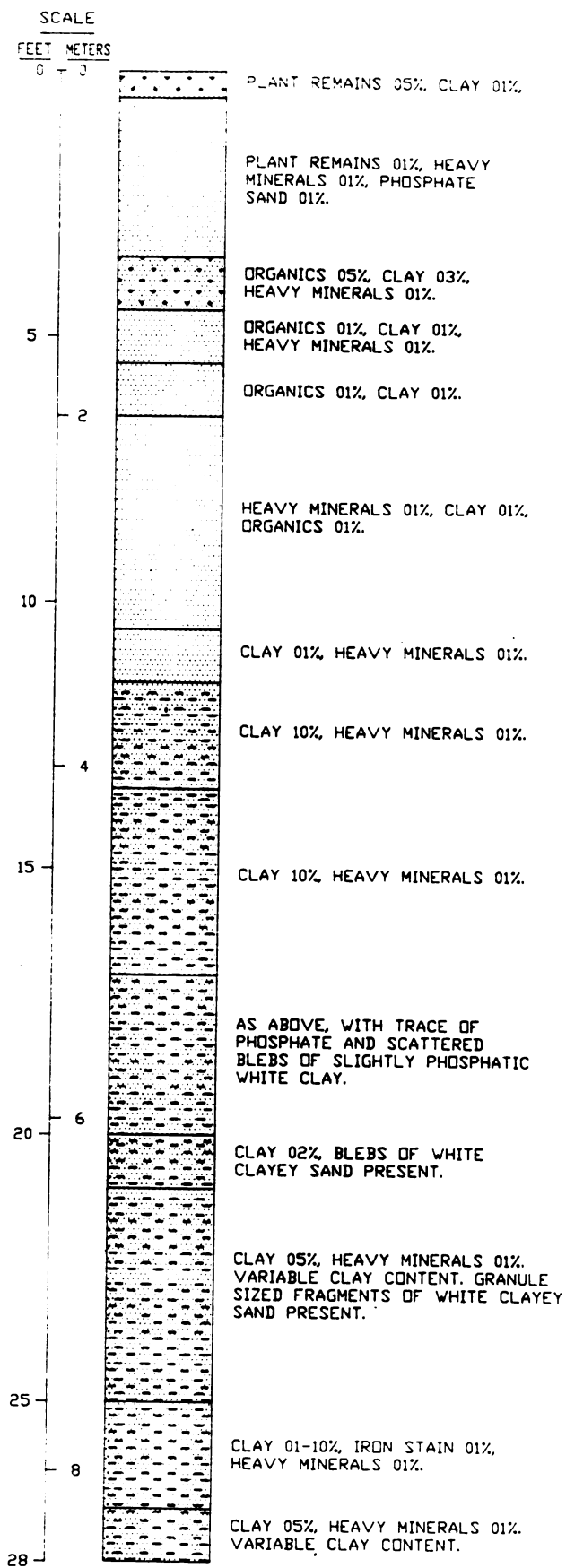
ELEVATION - 087 FT

OWNER/DRILLER: OWNER: LONCALA PHOSPHATE CO.; DRILLER: FGS.

WORKED BY: RICHARD GREEN AND KEN CAMPBELL 6/91; --AUGER SITE FA-A8--
CONTINUOUS SHELBY TUBE SAMPLES.

0. - . UNDIFFERENTIATED SAND AND CLAY
- 0 - .5 SAND; LIGHT OLIVE GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
ACCESSORY MINERALS: PLANT REMAINS-05%, ORGANICS- %, CLAY-01%;
- .5- 3.5 SAND; VERY LIGHT ORANGE TO GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: PLANT REMAINS-01%, HEAVY MINERALS-01%, PHOSPHATIC SAND-01%;
- 3.5- 4.5 SAND; VERY LIGHT ORANGE TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: ORGANICS-05%, HEAVY MINERALS-01%, CLAY-03%;
- 4.5- 5.5 SAND; DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: ORGANICS-01%, CLAY-01%, HEAVY MINERALS-01%;
- 5.5- 6.5 SAND; VERY LIGHT ORANGE TO DARK YELLOWISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: ORGANICS-01%, CLAY-01%;
- 6.5- 10.5 SAND; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%, CLAY-01%, ORGANICS-01%;
BECOMES LIGHTER IN COLOR WITH DEPTH.

- 10.5- 11.5 SAND; VERY LIGHT ORANGE TO GRAYISH ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-01%, HEAVY MINERALS-01%;
- 11.5- 13.5 SAND; GRAYISH ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: CLAY-10%, HEAVY MINERALS-01%;
- 13.5- 17 SAND; GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
ACCESSORY MINERALS: CLAY-10%, HEAVY MINERALS-01%;
- 17 - 20 AS ABOVE
WITH ADDITION OF 3% CLAY, TRACE PHOSPHATE GRAINS AND SCATTERED BLEBS OF SLIGHTLY
PHOSPHATIC WHITE CLAY.
- 20 - 21 SAND; GRAYISH BROWN TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
ACCESSORY MINERALS: CLAY-02%;
BLEBS OF WHITE CLAYEY SAND PRESENT.
- 21 - 25 SAND; VERY LIGHT ORANGE TO GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%, CLAY-05%;
GRANULE SIZED FRAGS. WELL INDURATED WHITE CLAYEY SAND. CLAY CONTENT VARIABLE.
- 25 - 27 SAND; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
ACCESSORY MINERALS: HEAVY MINERALS-01%, IRON STAIN-01%, CLAY-01%, CLAY-10%;
UNCONSOLIDATED TO POORLY INDURATED. VARIABLE CLAY CONTENT.
- 27 - 28 SAND; VERY LIGHT ORANGE TO WHITE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE;
ROUNDNESS: ROUNDED TO ANGULAR; MEDIUM SPHERICITY; POOR INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-05%, HEAVY MINERALS-01%;
TRACE OF WHITE CLAY. VARIABLE CLAY CONTENT.
- 28 TOTAL DEPTH



W-16657
GILCHRIST COUNTY, FL.
AUGER SITE FA-A8
ELEVATION 87'.
T. 09S R. 16E S. 24 CD
LAT= N 29D 41M 05S
LON= W 82D 39M 53S
TOTAL DEPTH: 28.0'.

0-T.D. UNDIFFERENTIATED
SAND AND CLAY

KEY

- FINE SAND
- MEDIUM SAND
- COARSE SAND
- CLAY
- ORGANICS
- LIMESTONE
- PHOSPHATE



A000023236905