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OPEN-FILE REPORT 93

Text to accompany geologic map of the eastern portion of the USGS Ocala 30 x 60 minute quadrangle, north-central Florida

By

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ABSTRACT

The accompanying 1:100,000 scale geologic map (Open-File Map Series 100, Plate 1) depicts the areal distribution of bedrock and surficial geologic units for the eastern half of the USGS Ocala 30 x 60 minute quadrangle. The map was constructed using a combination of field mapping (at 1:24,000 scale), compilation of data from existing maps (various scales), core and cuttings analyses and descriptions, and analyses of various Geographic Information System (GIS) data sources. The resulting data was compiled in ESRI® ArcGIS® ArcMap™ 9.2 software for publication as part of the Florida Geological Survey Open-File Map Series. Mapped units range in age from the Upper Eocene Ocala Limestone to undifferentiated Holocene sediments. Important resources in the mapped area include groundwater, springs, sand, clay and limestone. Numerous springs, swallets (sinking streams), and other karst features are present in the study area. Understanding of geologic units, karst, springs and their interactions within the area aids land planners, environmental professionals, and citizens in making land-use decisions such as designing new construction projects, siting new water supply wells, locating sources of mineable resources for aggregate supply, and protection of springs and water quality.

Keywords: Florida, geologic map, Cypresshead Formation, Coosawhatchie Formation, Hawthorn Group, Ocala Limestone, Avon Park Formation, environmental geology, geomorphology, hydrogeology, springs, swallets, sinkholes, Floridan aquifer system, Marion County, Levy County, Alachua County, Citrus County, Putnam County, Brooksville Ridge.

INTRODUCTION

This report accompanies Open-File Map Series (OFMS) 100, which is comprised of three plates. Plate 1 depicts the near-surface geology of the eastern half of the USGS Ocala 30 x 60 minute quadrangle on a digital elevation model (DEM). Plate 2 depicts six geologic cross sections, a stratigraphic correlation chart, and representative photos for several of the lithologic units in the study area. Plate 3 shows a geomorphology map on a digital elevation model (DEM), locations of known springs, sinkholes, and swallets, along with photographs of selected exposures within the study area.

The study area lies south of Gainesville, Florida and surrounds the city of Ocala, Florida. It includes portions of Marion, Alachua, Citrus, Putnam, and Levy Counties (Figure 1). It lies due south of the eastern portion of the USGS Gainesville 30 x 60 minute quadrangle, which was previously mapped under the STATEMAP program (Green et al., 2005). Three regionally important rivers, the Withlacoochee River, the Rainbow River, and the Silver River, occur in the

map area. Much of the area serves as recharge to the Floridan aquifer system, the primary source of drinking water in the region.

One objective for this report is to provide basic geologic information for the accompanying geologic map, cross sections, and geomorphology plate. Information provided by this report and the plates in OFMS 100 is intended for a diverse audience comprising professionals in geology, hydrology, engineering, environmental and urban planning, and laypersons, all of whom have varying levels of geologic knowledge. The map can help users identify and interpret geologic features which impact activities related to groundwater quality and quantity, location of mineral resources, land-use planning and designing construction projects. Applied uses of the maps and data in this report include: 1) identifying potential new mineral resources, 2) characterizing zones of potential aquifer recharge and confinement, 3) aiding in water-management decisions on groundwater flow and usage, 4) providing information on aquifer vulnerability to potential pollution, 5) ecosystem, wetlands, and environmental characterization and 6) recreational uses.

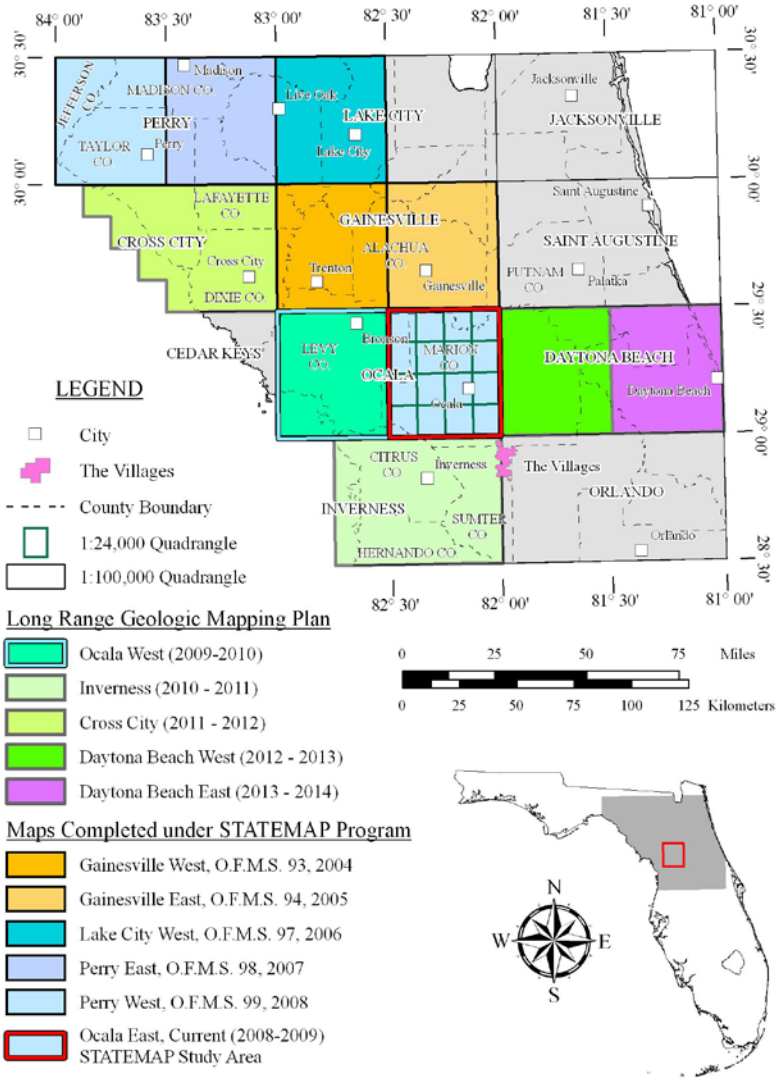

Figure 1. Nearby areas mapped under the FGS STATEMAP Program.

Methods

Mapping efforts consisted of: 1) reviewing and compiling existing geologic literature and data, 2) mapping geologic units in the field at 1:24,000 scale using standard techniques, 3) core and cuttings analyses of existing samples, 4) new core drilling, 5) collecting and describing outcrop samples and 6) preparing a geologic map, geological cross-sections and geomorphic map of the area. Field work, performed during the fall of 2008 through the spring and summer of 2009, consisted of sampling and describing numerous outcrops, river and pit exposures. One hundred twenty-seven new samples of geologic material were added to the FGS surface-sample archives (M-Series) and four new cores were drilled. An additional 86 archived M-Series samples and over 200 outcrops and exposures were also examined during this project. All data, including data from over 400 wells, were compiled and analyzed by the authors. The map and accompanying plates were developed in ESRI® ArcGIS® ArcMap™ 9.2 software for publication as part of the Florida Geological Survey Open-File Map Series.

Much of the study area is blanketed by a veneer of undifferentiated Tertiary and Quaternary sediments and soils. For this reason, and in keeping with geologic mapping practices developed by Scott et al. (2001), the authors have adopted the policy of mapping the first named geologic unit within 20 feet (6.1 meters) of the surface. If undifferentiated Tertiary/Quaternary (TQu), undifferentiated Quaternary (Qu) or undifferentiated Holocene (Qh) sediments attain a thickness greater than 20 feet (6.1 meters), then they appear as the mapped unit. If these undifferentiated sediments are less than 20 feet (6.1 meters) thick, then the underlying stratigraphic unit appears on the map.

The region is generally vegetated, and public access in parts of the mapped area is hindered by the presence of numerous farms, ranches and privately owned land. Much of the northeastern portion of the study area is owned by Plum Creek Timber Company, Inc., and permission to access the area for drilling operations was denied by the company; therefore the authors had to rely on existing data for mapping in parts of that area. Fieldwork access was typically limited to public roads, State-owned lands, and St. Johns River Water Management District and Southwest Florida Water Management District-owned lands.

Previous Work

The current study builds on many previous geologic investigations in and around the present map area which were useful in preparing this report. Preliminary county geologic maps for Marion (Scott, 1992a), Levy (Campbell, 1992), Alachua (Scott and Campbell, 1992), Citrus (Campbell and Scott, 1992) and Putnam (Scott, 1992b) Counties at scales of 1:126,720 were previously published by the Florida Geological Survey (FGS). However each of these Open-File Map Series geologic maps were constructed in an average time-frame of two weeks utilizing selected in-house geologic data with little to no extra field work. Although these maps provided an excellent starting point for the detailed geologic mapping undertaken for this project, significant refinement of the geologic maps was possible as a result of this project. A statewide geologic map (Scott et al., 2001) was published by the FGS in digital format and provided much of the base map material. A structure-contour map of the top of the Floridan aquifer system (Allison et al., 1995), and an isopach map of the Hawthorn Group in the region (Groszos and Rupert, 1992) also proved useful.

This study benefited greatly from the work performed for geologic mapping in the eastern portion of the USGS Gainesville 30 x 60 minute quadrangle (Green et al., 2005) and the western portion of the USGS Gainesville 30 x 60 minute quadrangle (Evans et al., 2004). Many of the field relationships and stratigraphic problems were worked out during those projects and data gathered during those projects proved invaluable to the completion of this project.

GEOLOGIC SUMMARY

The near surface geology of the eastern portion of the USGS 30 x 60 minute Ocala quadrangle is composed of a complex mixture of Eocene to Holocene carbonate and siliciclastic sediments. A combination of factors, including fluvio-deltaic deposition, marine deposition, dissolution of underlying carbonates, erosion of sediments as a result of eustatic changes in sea level and structural features, have influenced the geology of the study area.

Much of the eastern portion of the Ocala quadrangle is located within the Withlacoochee River and Oklawaha River basins (Figure 2). These rivers and their tributaries contain numerous documented springs, including one first magnitude spring (Silver Springs) and 33 lesser magnitude springs (Scott et al., 2004). A first magnitude spring is defined as having a minimum average flow of 100 cubic feet per second, or 64.6 million gallons per day (Copeland, 2003). Many of these springs have shown significant increases in pollutants in the last few decades, particularly nitrate (Phelps, 1994; Phelps, 2004; Jones et al., 1996; Scott et al., 2002; Upchurch et al., 2004). Detailed geologic mapping of lithostratigraphic units in this area provides critical data needed for future assessments of the vulnerability of the aquifer systems and these springs to contamination. The recharge areas for many of these springs are believed to be located in and around the current study area. Understanding the surficial geology of the map area is a key factor in developing management and protection plans, not only for the springs, but for the unconfined portions of the Floridan aquifer system (FAS).

Structure

Several structural variables have affected the geology of the region (Figure 3). The Peninsular Arch, a structurally high area which affected deposition from the Cretaceous to the early Cenozoic, is the dominant subsurface feature in the Florida peninsula (Applin and Applin, 1944; Applin, 1951; Puri and Vernon, 1964; Williams et al., 1977; Schmidt, 1984; Miller, 1986; Scott, 1997). The axis of the Peninsular Arch, which lies primarily to the east of the study area, extends from southeastern Georgia to the vicinity of Lake Okeechobee in southern Florida in a general northwest to southeast trend. The crest of the arch passes beneath Alachua County north of the study area and is highest in Union and Baker Counties north of the study area. The arch was a topographic high during most of the Cretaceous Period and had Upper Cretaceous sediments deposited over it (Applin, 1951). It formed a relatively stable base for Eocene carbonate deposition except during times of periodic land emergence due to lowered sea levels (Williams et al., 1977). The arch did not affect mid Tertiary to Holocene sediment deposition (Williams et al., 1977; Scott, 1997).

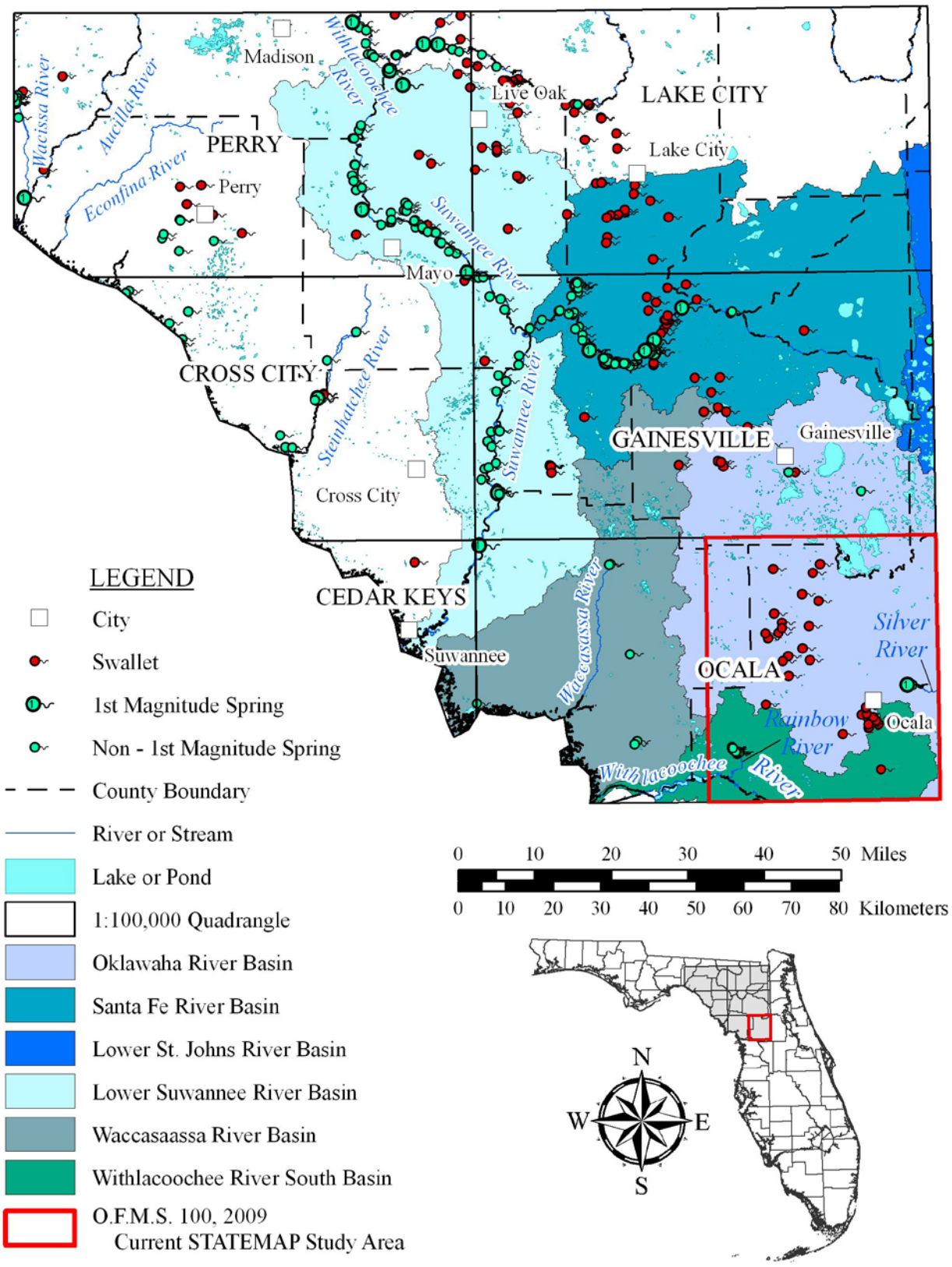

Figure 2. Location of selected river basins, springs, swallets, and other water bodies.

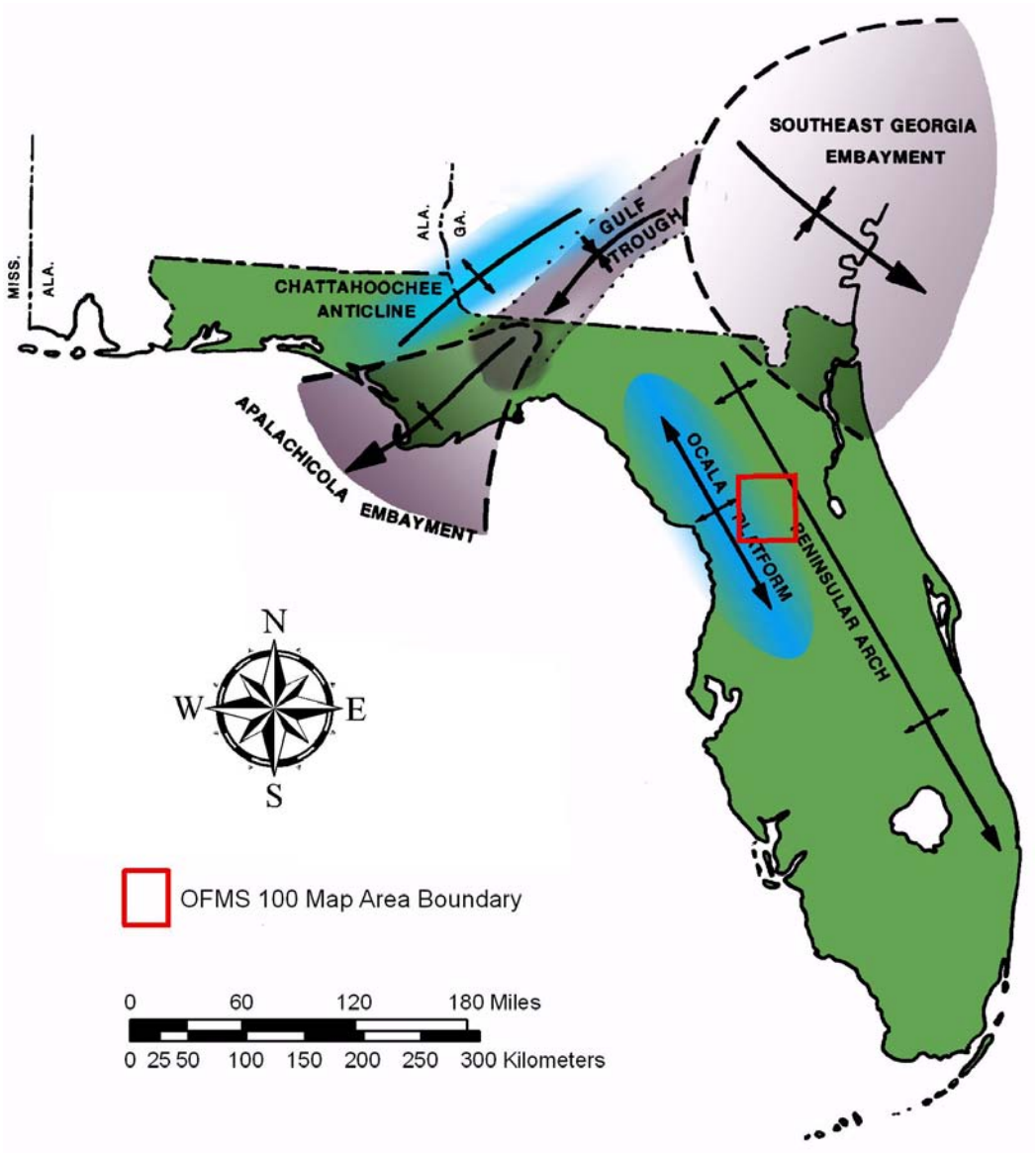

Figure 3. Principal subsurface structures of north Florida (modified from Puri and Vernon, 1964 and Schmidt, 1984).

The Ocala Platform is the most prominent structure affecting the near surface depositional and post-depositional environments within the map area. Hopkins (1920) originally named this feature the Ocala Uplift. Vernon (1951) described the Ocala Uplift as a gentle flexure developed in Tertiary sediments with a northwest-southeast trending crest. Because there is continuing uncertainty about the origin of this feature, Scott (1988) used the term Ocala Platform, rather than Ocala Uplift or Ocala Arch, since it does not have a structural connotation.

The Ocala Platform, which lies primarily to the west of the current study area, exerted its influence on late Tertiary sediment deposition. Miocene sediments of the Hawthorn Group are

thought to have been deposited across the platform (Scott, 1981a; Scott, 1988; Scott, 1991b). Post-Miocene erosion has removed sediments of the Hawthorn Group from much of the crest of the Ocala Platform, exposing Eocene and Oligocene carbonates (Cooke, 1945; Espenshade and Spencer, 1963; Scott, 1981b). This is evident throughout much of the map area (see OFMS 100, Plate 1). Undifferentiated sediments have subsequently been deposited on the exposed Eocene carbonates within the map area. These consist of residual clays, sands, and aeolian sands deposited during the Pliocene to Holocene (Scott, 1997).

Vernon (1951), utilizing aerial photographs, mapped fracture patterns throughout northern peninsular Florida. Regionally, these fractures generally trend parallel to the axis of the Ocala Platform in a northwest-southeast orientation. A secondary system of fractures intersects these primary fractures at high angles in a northeast-southwest trend (Vernon, 1951). Orientation of stream meanders along portions of the Rainbow, Silver, and Withlacoochee Rivers suggests that these fracture patterns may be a controlling factor in stream location.

Vernon (1951) also discussed the occurrence of faults in part of the Florida peninsula. He attributed the origin of the faults to his postulated uplift of the Ocala Platform (his Ocala Uplift). Although he described the occurrence and surface-strike orientation of the faults, there was no discussion of the dip of the faults. Vernon did mention that his postulated faults were very steeply inclined. Vernon (1951) also mentioned seeing slickensides and grabens in quarries west of the study area. Similar features have been observed by several of the authors of this publication while doing fieldwork in the region. It is believed that these are related to karst collapse and localized block movement within the karst feature, not to faulting as Vernon (1951) suggested. When a cover collapse sinkhole forms, large blocks may move downward along fractures created by the collapse and create localized slickensides which are not related to structural faulting. Additionally, numerous wells which Vernon (1951) used for cross sections which depicted faults in his report were investigated for this current study and several were deemed to be drilled in karst features. For example, W-1198 (see Vernon, 1951; Figure 14), appears to be karst infill. Karst features in the study area are very common (OFMS 100; Plate 3, Photo 2), and may reach over 100 feet deep in some areas such as Blue Grotto near Williston, Florida.

Geomorphology

Several relict Neogene coastal terraces, which developed as a result of fluctuating sea levels, have been documented in the study area. Healy (1975) recognized five marine terraces within the study area (Figure 4) based upon elevation: the Talbot terrace at elevations between 25 and 42 feet (7.6 and 12.8 meters) above mean sea-level (MSL), the Penholoway terrace at elevations between 42 and 70 feet (12.8 and 21.3 meters) above MSL, the Wicomico terrace at elevations of 70 to 100 feet (21.3 to 30.5 meters) above MSL, the Sunderland/Okefenokee terrace at elevations between 100 and 170 feet (30.5 and 51.8 meters) above MSL and the Coharie terrace at elevations between 170 and 215 feet (51.8 and 70.5 meters). Detailed discussions and correlations of these marine terraces and relict shorelines have been attempted by many authors, including Matson and Sanford (1913), Cooke (1931, 1939), Flint (1940, 1971), MacNeil (1950), Alt and Brooks (1965), Pirkle et al. (1970) and Healy (1975).

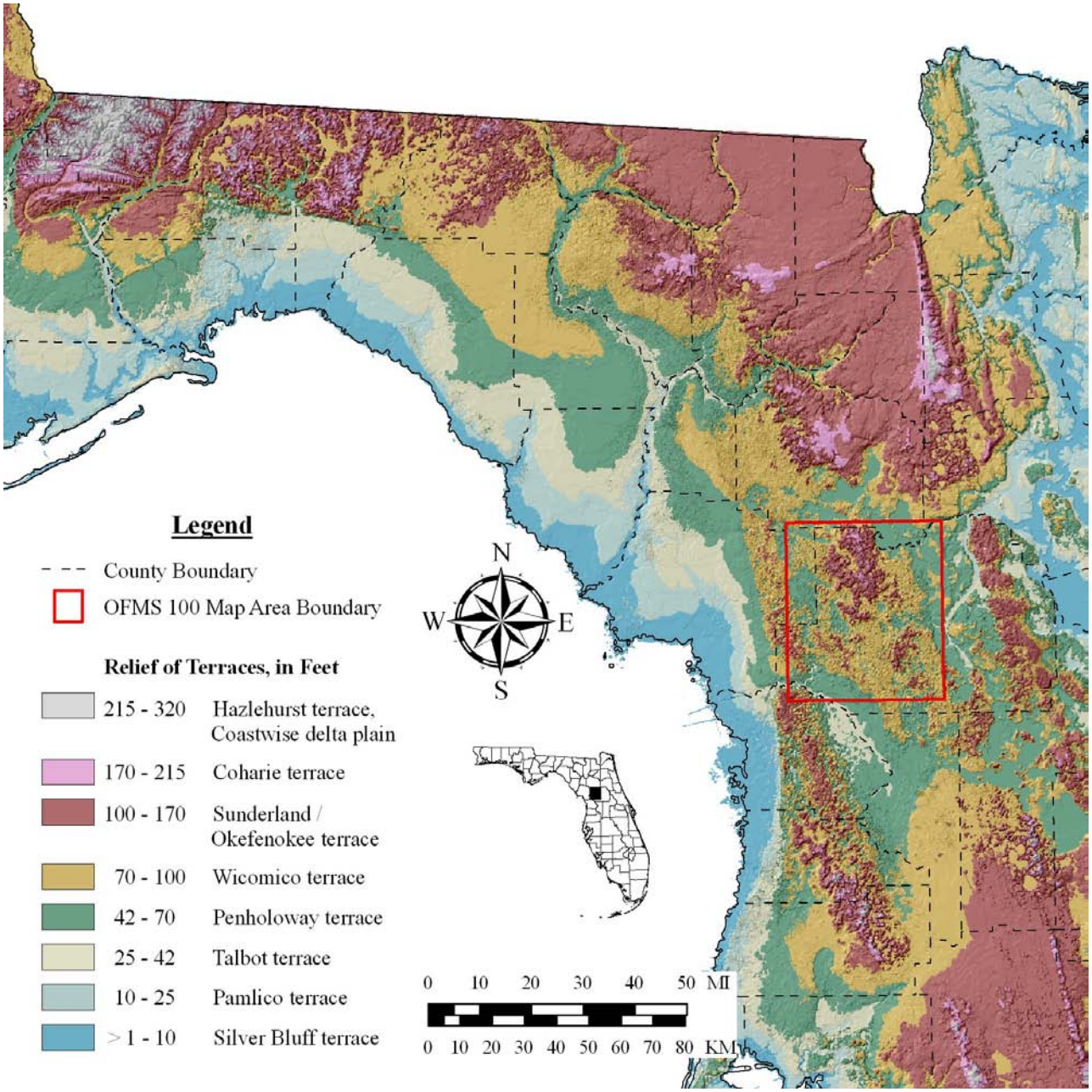

Figure 4. Terraces in Florida (after Healy, 1975).

According to Scott and Paul (in preparation), the study area contains portions of two geomorphic districts – the Central Lakes District and the Ocala Karst District (OFMS 100; Plate 3, Figure 2). Within the map area, these districts have been further subdivided topographically into nine regional physiographic units. Three units, the Fort McCoy Plain, the Hawthorne Lakes Region and the Oklawaha River Valley are in the Central Lakes District. The remaining six of these, the Brooksville Ridge, the Chiefland Karst Plain, the Crystal River Karst Plain, the Fairfield Karst Hills, the Ocala Karst Hills and the Williston Karst Plain are in the Ocala Karst District.

Central Lakes District

The Central Lakes District occupies most of the Central Highlands of Cooke (1939) in peninsular Florida. The district extends from eastern Alachua County, southeastern Bradford County and southern Clay County to southernmost Highlands County. The Central Lakes District lies east and south of the Ocala Karst District, west of the Barrier Island District, and south of the Okefenokee Basin District (OFMS 100; Plate 3, Figure 2). A thick layer of siliciclastic and carbonate sediments of the Hawthorn Group and siliciclastic sediments of the Cypresshead Formation and undifferentiated Quaternary sediments overlie the Ocala Limestone in the district. These sediments may reach up to 200 feet (61 meters) thick.

Dissolution of the limestone and subsequent subsidence or collapse has created the characteristic sinkhole lakes and dry sinks that dominate the landscape. The district is bounded on the east by erosional scarps with toe elevations ranging from approximately 30 feet (9.1 meters) to 90 feet (27.4 meters) above MSL. Portions of the western boundary are marked by scarps with elevations ranging from 40 feet (12.2 meters) to 130 feet (39.6 meters) above MSL. Scott and Paul (in preparation) have divided the Central Lakes District into three geomorphic provinces within the study area: the Fort McCoy Plain, the Hawthorne Lakes Region, and the Oklawaha River Valley (OFMS 100; Plate 3, Figure 3).

Fort McCoy Plain

The Fort McCoy Plain is a relatively flat, poorly to moderately drained area just east of the Ocala Karst Hills and southeast of the Hawthorne Lakes Region (OFMS 100; Plate 3, Figure 3). Scattered sinkholes are present within the province and elevations range from approximately 40 feet (12.2 meters) to approximately 90 feet (27.4 meters) above MSL within the study area. The Fort McCoy Plain is underlain by sediments of the Hawthorn Group, which are mantled with variable thicknesses of undifferentiated Quaternary sediments. East of the mapped area, the Fort McCoy Plain is underlain with Cypresshead Formation sediments (Scott et al., 2001).

Hawthorne Lakes Region

The Hawthorne Lakes Region is bounded to the north in Bradford County by the Southern Okefenokee Basin and the western flank of Trail Ridge, and to the west in Alachua County by the Alachua Karst Hills and the Williston Karst Plain (OFMS 100; Plate 3, Figure 3). The lakes in the Hawthorne Lakes Region formed through karst processes and were modified by subsequent surficial erosion. The surficial erosion has caused some of the formerly closed basins to develop outflow streams. Elevations in the northern portion of the region range from approximately 100 feet (30.5 meters) above MSL for the water levels in the lakes to over 200 feet (61 meters) above MSL on the hills. Relief generally decreases to the south. In the northern part of the mapped area, elevations range from 50 feet (15.2 meters) to just over 130 feet (39.6 meters) above MSL.

Oklawaha River Valley

The Oklawaha River Valley is a narrow valley extending from near the Lake-Marion County line northward to the Marion-Putnam County line. To the south, the valley abuts the Tavares Lakes Region. To the north, it merges with the St. Johns Offset Valley. The headwaters of the Oklawaha River occur in Lake Griffin, in the Tavares Lakes Region, a broader and more karstic portion of the Central Lakes Region. As it enters the Oklawaha River Valley, the river becomes confined to a narrow valley bounded by the Ocala Karst Hills and the Fort McCoy Plain on the west and the Mt. Dora Ridge on the east (OFMS 100; Plate 3, Figure 3). The province is underlain by Hawthorn Group sediments and undifferentiated Quaternary sediments. Elevations of the valley within the study area range from 40 feet (12.2 meters) to 70 feet (21.3 meters) above MSL.

Ocala Karst District

The Ocala Karst District encompasses a broad area from central Wakulla County in the panhandle of Florida, south to Hillsborough and Pinellas Counties in the west-central peninsula and inland to nearly the center of the peninsula (OFMS 100; Plate 3, Figure 3). Elevations within the district range from sea level along the coast to a maximum of 300 feet (91.4 meters) above mean sea level (MSL) on the Brooksville Ridge. Within the study area, elevations range from sea level to 210 feet (64.0 meters) above MSL in the north-central portion of the map area.

Carbonate sediments, ranging from the Middle Eocene Avon Park Formation to the Upper Eocene Ocala Limestone, lie at or near the land surface in this district within the study area. The Ocala Karst District is dominated by dissolution sinkholes and shallow bowl-shaped depressions, producing a rolling topography. Generally, a variably permeable siliciclastic cover allows downward percolating groundwater to slowly dissolve the underlying limestone, leading to cover-collapse sinkholes and cover-subsidence features (Sinclair and Stewart, 1985). Cover-collapse sinkholes form rather abruptly from the structural failure of an underlying cavern roof. An excellent example of this is at Devil's Millhopper Geological State Park, located in Alachua County northwest of the present study area (Evans et al., 2004).

Cover subsidence features generally occur in areas where sediments sag as carbonates dissolve underneath. Typically, areas such as these have shallow sinks formed by the downward movement of the siliciclastic overburden filling voids created by slow dissolution of underlying carbonates or by slow dissolution of the carbonate surface. Springs, sinking (swallets) and resurgent streams, and caverns commonly occur within the Ocala Karst District.

Brooksville Ridge

The Brooksville Ridge, described by White (1970) as "the most massive of the ridges which rise above the general level of the Central Upland", stands out in stark contrast to the surrounding karst plains. The Brooksville Ridge lies mostly west of the study area, but crosses the southwestern corner of the mapped area. It is separated into two sections (northern and southern) by the Withlacoochee River, which forms the boundary between Marion and Citrus Counties.

The northern portion of the Brooksville Ridge begins in Gilchrist and Alachua Counties and terminates in Levy and Marion Counties. The southern portion extends from Citrus County

southward into Pasco County. The two sections of the ridge differ in elevation, length to width ratio and underlying geology.

Elevations in the northern, narrower portion of the Brooksville Ridge range from approximately 50 feet (15.2 meters) to greater than 150 feet (45.7 meters) above MSL. Elevations in some sinkholes are less than 50 feet (15.2 meters) above MSL. The southern, broader part of the ridge ranges in elevation from approximately 50 feet (15.2 meters) to more than 300 feet (91 meters) above MSL. In a few sinkholes, elevations of approximately 10 feet (3 meters) above MSL occur.

The topography of the Brooksville Ridge displays significant variability. The northern section has low, rolling karst hills interspersed with moderately shallow sinkholes. The southern portion of the ridge becomes progressively hillier and terrain relief increases from north to south. White (1970) describes the southern ridge area as having "the most irregular surface to be found in any area of comparable size in peninsular Florida." From the vicinity of Brooksville southward, the hills are higher and more closely spaced. North of Brooksville, the hills are more widely spaced and generally have lower elevations, an indication of more mature karst. The Brooksville Ridge is well drained with wet conditions existing only in the low lying karst features. There are no springs found on the ridge.

The Upper Eocene Ocala Limestone underlies the northern portion of the Brooksville Ridge. Weathered Miocene Hawthorn Group sediments lie on the Ocala Limestone with undifferentiated Quaternary and/or Tertiary (Qu and TQu) siliciclastics mantling the ridge.

The southern portion of the Brooksville Ridge (which lies predominantly south and west of the mapped area) is more complex geologically than the northern section. This section of the Brooksville Ridge, which is only present in a small portion of the southwest corner of the mapped area (OFMS 100; Plate 3, Figure 1), is underlain by carbonates of the Middle Eocene Avon Park Formation and the Upper Eocene Ocala Limestone which are overlain by variable thicknesses of weathered Miocene undifferentiated Hawthorn Group (Th) sediments and undifferentiated Tertiary-Quaternary siliciclastics (TQu).

Chiefland Karst Plain

The Chiefland Karst Plain lies to the east of the southern portion of the Perry Karst-San Pedro Bay geomorphic feature, south of the Branford Karst Plain and west of the northern extension of the Brooksville Ridge (OFMS 100; Plate 3, Figure 3). It occurs from northern Gilchrist County to southern Levy County and is present in a small part of the southwestern corner of the mapped area between the northern portion of the Brooksville Ridge and the Crystal River Karst Plain (OFMS 100; Plate 3, Figure 1). Elevations in of the Chiefland Karst Plain in this area range from 30 feet (9.1 meters) to 100 feet (30.5 meters) above MSL.

This karst plain is more poorly drained than the Branford Karst Plain to the north (Evans et al., 2004). Many springs occur within the karst plain. The entire karst plain is underlain by either Upper Eocene Ocala Limestone or the Middle Eocene Avon Park Formation. Undifferentiated Quaternary siliciclastics overlie the karstified limestone in varying thicknesses.

Crystal River Karst Plain

The Crystal River Karst Plain occurs between the Gulf Coast and the southern Brooksville Ridge in Citrus and Hernando Counties, south of the Withlacoochee River (OFMS 100; Plate 3, Figure 3). It is an area of low relief with mature karst features and elevations ranging from sea level to 50 feet (15.2 meters) above sea level. Within the mapped area, elevations range from 30 feet (9.1 meters) to 50 feet (15.2 meters) above MSL. Karst features are usually shallow depressions. Springs are very common. The area is often well drained, becoming more poorly drained toward the coast. Sand dunes are common along the boundary with the Brooksville Ridge.

The Upper Eocene Ocala Limestone and Middle Eocene Avon Park Formation underlie most of the karst plain, and there is often a thin layer of undifferentiated Hawthorn Group sediments on top of the Ocala Limestone in this part of the map area. Undifferentiated Tertiary and Quaternary siliciclastic sediments cover the karst plain.

Fairfield Karst Hills

The Fairfield Karst Hills occur from southernmost Alachua County to northwestern Marion County (OFMS 100; Plate 3, Figure 3). The karst hills occur to the south of the Hawthorne Lakes Region and to the west of the Ocala Karst Hills. The extent of the province is very similar to the Fairfield Hills as delineated by White (1970). The elevations in this area range from a low of 20 feet (6.1 meters) to 190 feet (57.9 meters) above MSL and the area has greater relief than the Ocala Karst Hills.

The Fairfield Karst Hills province is well drained, with swampy conditions existing only in the low-lying karst features. The Fairfield Karst Hills is the only province in the study area with well-developed surface streams, reflecting the relatively impermeable nature of the underlying Hawthorn Group sediments. Springs are generally not found within these karst hills. The Fairfield Karst Hills developed in response to karstification of the Ocala Limestone and subsequent erosion of the Hawthorn Group sediments. Hills composed of Hawthorn Group sediments are common in the province where the karst is less mature. Quaternary siliciclastic sediments of varying thicknesses blanket the area.

Ocala Karst Hills

The Ocala Karst Hills occur from north-central Marion County southward to northeastern Sumter County (OFMS 100; Plate 3, Figure 3). Elevations in the province within the mapped area range from 20 feet (6.1 meters) to 190 feet (57.9 meters) above MSL, with overall lesser relief than the Fairfield Karst Hills. Many of the higher hills in the province are erosional remnants of Hawthorn Group sediments (OFMS 100; Plates 1 and 2). Overall, the province is well-drained internally by karst and surface streams are not common.

Several springs are present in the Ocala Karst Hills, including Silver Springs, which occurs at the eastern edge of the province along the boundary with the Central Lakes District. The karst in this province is more mature and the Hawthorn Group sediments are thinner to absent than in the Fairfield Karst Hills province. There are isolated hills of remnant Hawthorn Group sediments scattered throughout the province (see OFMS 100, Plate 1). Quaternary siliciclastic sediments of

varying thicknesses blanket the area. There is a small area in the Ocala Karst Hills along the eastern boundary of the mapped area which has Cypresshead Formation sediments at the surface (see OFMS 100, Plate 1).

Williston Karst Plain

The Williston Karst Plain, located on the eastern flank of the Brooksville Ridge (OFMS 100; Plate 3, Figure 3), extends eastward to the Hawthorne Lakes Region, the Fairfield Karst Hills and the Ocala Karst Hills and is underlain by the Ocala Limestone. It is covered with variable thicknesses of undifferentiated Quaternary sediments (Scott and Paul, in preparation).

It merges with the Branford Karst Plain and Chiefland Karst Plain northwest of the study area (OFMS 100; Plate 3, Figure 3). Within the mapped area, elevations of the Williston Karst Plain range from 10 feet (3.1 meters) to 100 feet (30.5 meters) above MSL. A few outlier hills, composed of weathered Hawthorn Group sediments, are present within this area and locally may exceed 140 feet (42.7 meters) above MSL. Much of the plain is well drained and a number of springs, including Rainbow Springs, occur within this area.

LITHOSTRATIGRAPHIC UNITS

Tertiary System

Eocene Series

Avon Park Formation

The Middle Eocene Avon Park Formation (Tap), first described by Applin and Applin (1944), is the oldest unit investigated in the present study area. The unit, which only occurs in the subsurface in the study area, consists of cream to light-brown to tan, poorly-indurated to well-indurated, variably fossiliferous limestone (grainstone to wackestone, with rare mudstone). The limestones are interbedded with tan to brown, very poorly- to well-indurated, very fine to medium crystalline, fossiliferous (molds and casts), vuggy dolostones. Fossils present in the unit include mollusks, foraminifera (*Spirolina* sp., *Lituonella floridana*, *Bolivina* sp., and *Dictyoconus americanus*), echinoids, algae, organics and carbonized plant remains.

Because the Avon Park Formation is entirely a subsurface unit within the mapped area, it was only investigated for wells utilized for cross sections in the project. The top of the Avon Park ranges from 160 feet (48.8 meters) below MSL in W-18919 (cross-sections A-A’ and F-F’; OFMS 100, plate 2) to 17 feet (5.2 meters) above MSL in W-1174 (cross-section E-E’; OFMS 100, plate 2). No wells utilized for cross-sections penetrated the entire section of the Avon Park Formation. The Avon Park Formation forms part of the Floridan aquifer system (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Ocala Limestone

The Upper Eocene Ocala Limestone (To), first described by Dall and Harris (1892), is a biogenic marine limestone comprised largely of foraminifera, mollusks, echinoids and bryozoans. The unit, which sits unconformably on the Avon Park Formation, may be dolomitized to varying degrees within the study area, making the contact between the two units difficult to discern, particularly in cuttings. Based on lithologic differences, the Ocala Limestone can be informally subdivided into an upper and lower unit (Scott, 1991a). This subdivision, while often apparent in cores and quarries, is not readily apparent in cuttings. As a consequence of this, the geologic cross sections do not break out the upper and lower Ocala Limestone.

The upper unit is typically a white to cream, fine- to coarse-grained, poorly- to well-indurated, moderately to well sorted, very fossiliferous limestone (wackestone, packstone, and grainstone). Fossils commonly include foraminifera (*Lepidocyclina ocalana*), bryozoans, mollusks, and a rich diversity of echinoids. The lower unit is typically a white to cream, fine- to medium-grained, poorly- to moderately-indurated, moderately to well sorted limestone (grainstone to packstone). Fossils include foraminifera (*Amphistegina pinarensis cosdensi*, *Nummulites* [*Camerina*] *vanderstoki*, *Nummulites* [*Operculinoides*] *ocalana*), bryozoans, algae, mollusks, echinoids, and crabs.

The top of the Ocala Limestone, which is often heavily karstified (see Photo 2 on OFMS 100, plate 3), ranges from over 150 feet (45.7 meters) above MSL in field exposures to 11 feet (3.4 meters) below MSL in W-18919 (cross sections A-A' and F-F'; OFMS 100, plate 2). Most of the wells utilized for geologic cross sections penetrate the entire thickness of the Ocala Limestone. In these wells, the thickness of the Ocala Limestone ranges from less than 10 feet (3.5 meters) in W-1194 (cross-section D-D'; OFMS 100, plate 2) to 176 feet (53.6 meters) in W-18877 (cross-sections A-A' and E-E'; OFMS 100, plate 2). The Ocala Limestone is generally highest where it has been protected to some extent from dissolution by thick sequences of Hawthorn Group sediments, such as in the Fairfield Hills area (see Plate 1, OFMS 100). The Ocala Limestone forms part of the Floridan aquifer system (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Miocene Series

Hawthorn Group

Sediments of the Miocene Hawthorn Group are thought to have been deposited over the Ocala Platform throughout the area, but post-Miocene erosion and karstification has removed sediments from the crest of the Ocala Platform, exposing the Eocene carbonates in the central and southern portion of the map area (Cooke, 1945; Espenshade and Spencer, 1963; Scott, 1981b). Fossils in the Hawthorn Group are sparse but may include vertebrate remains, corals, and mollusks. Williams et al. (1977) report that the most commonly found fossils are oysters and coral heads. Within the mapped area, the Hawthorn Group (Th) is composed of the Middle Miocene Coosawhatchie Formation (Thc) and undifferentiated Hawthorn Group (Th) sediments.

Where present, Hawthorn Group sediments unconformably overlie the Ocala Limestone (Scott, 1988). They are unconformably overlain by either the Cypresshead Formation (Tc), undifferentiated Quaternary sediments (Qu), or undifferentiated Tertiary/Quaternary sediments

(TQu; see OFMS 100, Plate 1). Permeability of both the Coosawhatchie Formation and the undifferentiated Hawthorn Group sediments is generally low and they form part of the intermediate aquifer system - intermediate confining unit (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Coosawhatchie Formation

The Coosawhatchie Formation (Thc) is present near the surface in the north-central and southeastern portions of the study area, where it unconformably overlies the Ocala Limestone. There are numerous hills of isolated Hawthorn Group sediments scattered throughtout the study area. These appear to be outliers of Coosawhatchie Formation sediments which are erosional remnants from the original extent of Hawthorn deposition over the area (see OFMS 100, Plate 1). The Coosawhatchie Formation consists of gray to bluish-gray sandy clay or clayey sand with phosphate grains, sands, and sandy limestone to dolostone. Lenses of relatively pure quartz sands, clays, or carbonate are uncommon (Scott, 1988). This unit is lithologically variable and beds may pinch out and interfinger both laterally and vertically. Outcrops of Coosawhatchie Formation in the study area are typically very weathered and consist of reddish-brown to white, clayey, calcareous quartz sands to sandy clays with leached phosphate grains and limonitic and calcareous pebbles. The reader is referred to Scott (1988) for a complete discussion of the unit.

Where present, the Coosawhatchie Formation ranges from over 180 feet (54.9 meters) above MSL in field exposures in the vicinity of W-18877 (cross sections A-A' and E-E'; OFMS 100, plate 2) to 18 feet (5.5 meters) below MSL in W-18289 (cross section A-A', OFMS 100, plate 2). Thickness of the unit ranges up to 122 feet (37.2 meters) in W-9449 (cross section A-A', OFMS 100, plate 2).

Undifferentiated Hawthorn Group

Undifferentiated Hawthorn Group sediments are light olive gray and blue gray in unweathered sections and reddish brown in weathered sections. They consist of poorly to moderately consolidated, clayey sands to silty clays and relatively pure clays with little to no phosphate (Scott, 2001). These sediments are present along parts of the Brooksville Ridge, and in the south-central portion of the map area, where they are often deeply weathered (see OFMS 100, Plate 1). In the Brooksville Ridge area, undifferentiated Hawthorn Group sediments are often overlain by more than 20 feet (6.1 meters) of undifferentiated Tertiary and Quaternary sediments (TQu). Hard-rock phosphate deposits are associated with the undifferentiated Hawthorn Group sediments in several places along the eastern flank of the Brooksville Ridge. These hard-rock phosphate deposits were formed by dissolution of phosphates from the Hawthorn Group and subsequent precipitation in karst features within the Ocala Limestone (Scott, 2001).

Sediments of the undifferentiated Hawthorn Group were only penetrated in a few wells in the western portion of the map area. In these, the top of the Hawthorn Group ranges from 62 feet (18.9 meters) above MSL in W-18894 (cross-section D-D'; OFMS 100, plate 2) to near sea level in W-6903 (cross-section D-D'; OFMS 100, plate 2). The undifferentiated Hawthorn Group ranges from approximately 20 feet (6.1 meters) thick in W-18894 (cross section B-B'; OFMS 100, plate 2) to 30 feet (9.1 meters) thick in well W-6903 (cross section D-D'; OFMS 100, plate 2).

Tertiary/Quaternary Systems

Pliocene Series

Cypresshead Formation

The Cypresshead Formation (Tc) was originally named by Huddlestun (1988) and was extended into Florida by Scott (1988). It is a mottled reddish-brown to reddish-orange to white, unconsolidated to poorly consolidated, fine to very coarse grained, variably clayey to clean quartz sand. Cross-bedded sands are common within this formation. Discoid quartzite pebbles, mica, and ghosts of nearshore mollusks are often present.

In general, the Cypresshead Formation is exposed at the surface above 100 feet (30.5 meters) above mean sea level (Scott, 2001). The Cypresshead Formation is a nearshore, shallow marine deposit equivalent to the deltaic sediments of Citronelle Formation and the Miccosukee Formation prodeltaic sediments (Scott, 2001). It is present at or near the surface east of the study area and south of Trail Ridge. Limited exposures of Cypresshead Formation were observed and sampled in sand pits east of Belleview in a small area along the eastern edge of the map (OFMS 100, Plate 1).

The Cypresshead Formation is unconformably overlain by undifferentiated Quaternary sediments (Qu). Permeable sediments of the Cypresshead Formation form part of the surficial aquifer system (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Undifferentiated Tertiary/Quaternary Sediments

Undifferentiated Tertiary/Quaternary sediments (TQu) are siliciclastics that are separated from the undifferentiated Quaternary sediments solely on the basis of elevation (Scott et al., 2001). Pleistocene sea levels reached a maximum of approximately 100 feet (30.5 meters) above MSL (Colquhoun, 1969). The sediments which occur above 100 feet (30 meters) MSL are predominately older than Pleistocene but may have been reworked during the Pleistocene. They are present along the western edge of the map area in the Brooksville Ridge (OFMS 100, Plates 1 and 2). These poorly consolidated to unconsolidated siliciclastics are white to gray to orange to blue-green, fine to coarse grained, clean to clayey unfossiliferous sands, sandy clays and clays with variable admixtures of clay and organics. Permeable sediments of the undifferentiated Tertiary/Quaternary sediments form part of the surficial aquifer system (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Pleistocene Series

Undifferentiated Quaternary Sediments

Undifferentiated Quaternary sediments (Qu) lie unconformably on either the Eocene Ocala Limestone (To), undifferentiated Hawthorn Group sediments (Th), the Coosawhatchie Formation of the Hawthorn Group (Thc), or the Cypresshead Formation (Tc). Along the eastern

edge of the map area, they are likely derived from erosion and re-deposition of sediments from the Coosawhatchie Formation and the Cypresshead Formation.

The areas of undifferentiated Quaternary sediments present in the southern and western portions of the mapped area are highly irregular in thickness. Data from this project indicates that the surface of the Ocala Limestone in these areas is heavily karstified. Overlying sediments may range from 20 feet (6.1 meters) to over 60 feet (18.3 meters) thick. Relief on the surface of the Ocala Limestone can easily exceed 30 feet (9.1 meters) in these karstic areas (OFMS 100; Plate 3, Photo 2). Much of these undifferentiated sediments are derived from erosion and weathering of Hawthorn Group and younger units, and sinkholes may contain Hawthorn Group sediments (Scott, 1992a). Field evidence also shows that pinnacles of Ocala Limestone and outliers of weathered Hawthorn Group sediments can occur in these areas.

Generally, these undifferentiated Quaternary sediments consist of white to gray to orange to blue-green, fine to coarse grained, clean to clayey unfossiliferous sands, sandy clays and clays with variable admixtures of organics. These sediments form part of the surficial aquifer system (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

Holocene Series

Undifferentiated Holocene Sediments

Undifferentiated Holocene sediments (Qh) are mapped within the Silver River valley and tributaries along the southeastern boundary of the study area. These sediments may include quartz sands, marls, organics, and minor carbonate sands and mud (Scott, 2001). While not recognized by the Florida Geological Survey as lithostratigraphic units, they are utilized in order to facilitate a better understanding of the State's geology. The undifferentiated Holocene sediments are part of the surficial aquifer system (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986).

HYDROGEOLOGY

The hydrogeology of the map area consists of (in ascending order) the Floridan aquifer system (FAS), the intermediate aquifer system - intermediate confining unit (IAS - ICU), and the surficial aquifer system (SAS) (Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986). The FAS, which is the primary source of drinking water in the region, is generally comprised of carbonate units of the Avon Park Formation and the Ocala Limestone. The sands, silts, clays and carbonates of the Hawthorn Group comprise the IAS/ICU. The IAS/ICU is highly localized and laterally discontinuous in the study area. The SAS is comprised of the Pliocene Cypresshead Formation, undifferentiated Tertiary/Quaternary sediments (TQu), undifferentiated Quaternary sediment on karstified Eocene Limestone (Quk), undifferentiated Quaternary sediments (Qu), and the Holocene undifferentiated sediments (Qh).

Where siliciclastic sediments of the Hawthorn Group and younger units are thick, they provide confinement for the FAS, but where the siliciclastic sediments of the Hawthorn Group and younger units are thin or missing, karst features often occur. "Swallets" (stream-to-sink

features) are of particular concern to geoscientists and hydrogeologists in the area. These generally occur in the vicinity of the Coosawhatchie Formation, where the sediments thin and are breached by karst features. Overland flow is captured by the karst features thus allowing for direct recharge to the FAS by surface water and runoff from agricultural and urban areas (OFMS 100; Plate 3, Figure 1).

DERIVATIVE PRODUCTS

Several derivative products will come from this project. During the mapping project, data from several hundred wells (Appendix A) were analyzed. Formation picks, made on all available wells with cores and cuttings samples, will allow for the creation of a structure contour map of the top the Floridan aquifer system, along with the creation of structure contour and isopach maps of the intermediate confining unit in the area. Additional derivative data that is anticipated to come from this mapping effort includes an aquifer vulnerability assessment map. Data derived from prior STATEMAP products has often been used to augment other Florida Geological Survey and Florida Aquifer Vulnerability Assessment (FAVA) projects in the State (Arthur et al., 2009; Baker et al., 2007).

REFERENCES

Allison, D., Groszos, M., and Rupert, F., 1995, Top of rock of the Floridan aquifer system in the Suwannee River Water Management District: Florida Geological Survey Open-File Map Series 84, scale 1:475,000.

Alt, D. and Brooks, H.K., 1965, Age of the Florida marine terraces: Journal of Geology, v. 73, no. 2, p. 406-411.

Applin, P., 1951, Possible future petroleum provinces of North America - Florida: American Association of Petroleum Geologists Bulletin, v. 35, p. 405-407.

Applin, P.L. and Applin, E.R., 1944, Regional subsurface stratigraphy and structure of Florida and southern Georgia: American Association of Petroleum Geologists Bulletin, v. 28, p. 1673-1753.

Arthur, J.D., Baker, J., Cichon, J., Wood, A. and Rudin, A., 2009, Florida Aquifer Vulnerability Assessment (FAVA): Contamination potential of Florida's principal aquifer systems: Florida Geological Survey Bulletin 67 (in press).

Baker, A.E., Wood, H.A.R. and Cichon, J.R., 2007, The Marion County Aquifer Vulnerability Assessment; unpublished report submitted to Marion County Board of County Commissioners in fulfillment of Marion County Project No. SS06-01, March 2007, 42 p.

Campbell, K.M., 1992, Geologic map of Levy County, Florida: Florida Geological Survey Open-File Map Series 11, Scale 1:126,720.

Campbell, K.M., and Scott, T.M., 1992, Geologic Map of Citrus County, Florida: Florida Geological Survey Open-File Map Series 10, Scale 1:126,720.

Colquhoun, D.J., 1969, Coastal plain terraces in the Carolinas and Georgia, U.S.A.: Wright, H.E., Jr., ed., Quaternary Geology and Climate: Volume 16 of the Proceedings of the VII Congress of the International Association for Quaternary Research, p. 150-162.

Cooke, C.W., 1931, Seven coastal terraces in the southeastern United States: Washington Academy of Sciences Journal, v. 21, p. 503-513.

Cooke, C.W., 1939, Scenery of Florida interpreted by a geologist: Florida Geological Survey Bulletin 17, 120 p.

Cooke, C.W., 1945, Geology of Florida: Florida Geological Survey Bulletin 29, 342 p.

Copeland, R., 2003, Florida spring classification system and spring glossary: Florida Geological Survey Special Publication 52, 17 p.

Dall, W.H. and Harris, G.D., 1892, Correlation papers, Neocene: United States Geological Survey Bulletin 84, 349 p.

Espenshade, G.H. and Spencer, C.W., 1963, Geologic features of phosphate deposits of northern peninsular Florida: United States Geological Survey Bulletin 1118, 115 p.

Evans, W.L., III, Green, R.C., Bryan, J.R. and Paul, D.T., 2004, Geologic map of the western portion of the USGS 1:100,000 scale Gainesville quadrangle, northern Florida: Florida Geological Survey Open-File Map Series 93, 2 plates, scale 1:100,000.

Flint, R.F., 1940, Pleistocene features of the Atlantic coastal plain: American Journal of Science, v. 238, p. 757-787.

Flint, R.F., 1971, Glacial and Quaternary Geology: New York, John Wiley and Sons, Inc., 892 p.

Green, R.C., Evans, W.L., III, Paul, D.T., and Scott, T.M., 2005, Geologic map of the eastern portion of the USGS 1:100,000 scale Gainesville quadrangle, northern Florida: Florida Geological Survey Open-File Map Series 94, scale 1:100,000, 2 plates.

Groszos, M. and Rupert, F.R., 1992, An isopach map of the Hawthorn Group in the Suwannee River Water Management District: Florida Geological Survey Open-File Map Series 2, scale 1:250, 000.

Healy, H.G., 1975, Terraces and shorelines of Florida: Florida Geological Survey Map Series 71, scale: 1:2,095,200.

Hopkins, O.B., 1920, Drilling for oil in Florida: United States Geological Survey Press Bulletin, April, 1920.

Huddleston, P.F., 1988, A revision of the lithostratigraphic units of the Coastal Plain of Georgia-The Miocene: Georgia Geological Survey Bulletin 104, 162 p.

Jones, G.W., Upchurch, S.B., and Champion, K.M., 1996, Origin of nitrate in groundwater discharging from Rainbow Springs, Marion County, Florida: Southwest Florida Water Management District Report, 155 p.

MacNeil, F.S., 1950, Pleistocene shorelines in Florida and Georgia: U.S. Geological Survey Professional Paper 221-F, p. 95-107.

Matson, G.C. and Sanford, S., 1913, Geology and groundwater of Florida: U.S. Geological Survey Water Supply Paper 319, 445 p.

Miller, J.A., 1986, Hydrogeologic framework of the Florida aquifer system in Florida and in parts of Georgia, Alabama, and South Carolina: Regional Aquifer-System Analysis: U.S. Geological Survey Professional Paper 1403-B, Washington, 91 p., 33 plates.

Phelps, G.G., 1994, Hydrogeology, Water Quality and Potential for Contamination of the Upper Floridan Aquifer in the Silver Springs Ground-Water Basin, Central Marion County, Florida: U.S. Geological Survey, Water-Resources Investigations Report 92-4159, 69 p.

Phelps, G.G., 2004, Chemistry of Groundwater in the Silver Springs Basin, with an emphasis on Nitrate: U.S. Geological Survey, Scientific Investigations Report 2004-5144, 54 p.

Pirkle, E.C., Jr., Yoho, W.H. and Hendry, C.W., Jr., 1970, Ancient sea level stands in Florida: Florida Geological Survey Bulletin 52, 61 p.

Puri, H.S. and Vernon, R.O., 1964, Summary of the geology of Florida and a guidebook to the classic exposures: Florida Geological Survey Special Publication 5, revised, 312 p.

Schmidt, W., 1984, Neogene stratigraphy and geologic history of the Apalachicola Embayment: Florida Geological Survey Bulletin 58, 146 p.

Scott, T.M., 1981a, The paleo-extent of the Miocene Hawthorn Formation in peninsular Florida [abstract]: Florida Scientist, v. 44, Supplement 1, p. 42.

Scott, T.M., 1981b, The Hawthorn Formation of North Florida: Southeastern Geological Society, Field Conference Guidebook, v. 23, p. 15-23.

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

Scott, T.M., 1991a, Depositional patterns of the Hawthorn Group in Florida: Geological Society of America Abstracts with Programs, v. 23, p. 126.

Scott, T.M., 1991b, A geological Overview: *in* Scott, T.M., Lloyd, J.M. and Maddox, G.L., eds., 1991, Florida's ground-water quality monitoring program, hydrogeologic framework: Florida Geological Survey Special Publication 32, 97 p.

Scott, T.M., 1992a, Geologic map of Marion County, Florida: Florida Geological Survey Open-File Map Series 13, scale 1:126,720.

Scott, T.M., 1992b, Geologic map of Putnam County, Florida: Florida Geological Survey Open-File Map Series 6, scale 1:126,720.

Scott, T.M., 1997, Miocene to Holocene history of Florida, *in* Randazzo, A.F. and Jones, D.S., eds., 1997, The Geology of Florida: Gainesville, University Press of Florida, 327 p.

Scott, T.M., 2001, Text to accompany the geologic map of Florida: Florida Geological Survey Open-File Report 80, 29 p.

Scott, T.M., 2005, Revisions to the geomorphology of Florida focusing on the eastern panhandle and north-central Florida, *in* Southeastern Geological Society Field Trip Guidebook 44, p. 18-36.

Scott, T.M., and Campbell, K.M., 1992, Geologic map of Alachua County, Florida: Florida Geological Survey Open-File Map Series 12, scale 1:126,720.

Scott, T.M., and Paul, D.T., (in preparation) Geomorphic map of Florida: Florida Geological Survey, scale 1:750,000.

Scott, T.M., Campbell, K.M., Rupert, F.R., Arthur, J.A., Green, R.C., Means, G.H., Missimer, T.M., Lloyd, J.M. and Duncan, J.G., 2001, Geologic map of Florida: Florida Geological Survey Map Series 146, scale 1:750,000.

Scott, T.M., Means, G.H., Means, R.C. and Meegan R.P., 2002, First magnitude springs of Florida: Florida Geological Survey Open-File Report 85, 138 p.

Scott, T.M., Means, G.H., Meegan, R.P., Means, R.C., Upchurch, S.B., Copeland, R.E., Jones, J., Roberts, T. and Willet, A., 2004, Springs of Florida: Florida Geological Survey Bulletin 66, 377 p.

Sinclair, W.C., and Stewart, J.W., 1985, Sinkhole Type, Development, and Distribution in Florida: Florida Geological Survey Map Series 110, scale 30 miles to 1 inch.

Southeastern Geological Society Ad Hoc Committee on Florida Hydrostratigraphic Unit Definition, 1986, Hydrogeological units of Florida: Florida Geological Survey Special Publication 28, 8 p.

Upchurch, S.B., Champion, K.M., Schnieder, J.C., Hornsby, D., Ceryak, R. and Zwanka, W., 2004, Defining springshed boundaries and water-quality domains near first-magnitude springs in north Florida [abstract]: Florida Scientist, v. 67, Supplement 1, 52 p.

U.S. Geological Survey, 1978, 1:100,000-scale metric topographic map of Ocala, Florida: Reston VA, U.S. Geological Survey, 1 sheet.

Vernon, R.O., 1951, Geology of Citrus and Levy Counties, Florida: Florida Geological Survey Bulletin 33, 256 p.

White, W.A., 1970, The geomorphology of the Florida peninsula: Florida Geological Survey Bulletin 51, 164 p.

Williams, K.E., Nicol, D. and Randazzo, A.F., 1977, The geology of the western part of Alachua County, Florida: Florida Geological Survey Report of Investigation 85, 97 p.

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APPENDIX A: WELLS UTILIZED FOR STUDY

Map ID	Well Label	Data Source	Sample Type	Longitude	Latitude	24K Quad	Elevation (feet)	Total Depth (feet)
1	W-6903	FGS	Core	82° 26' 44.64" W	29° 5' 22.09" N	Dunnellon	85	442
2	W-12415	FGS	Core	82° 19' 50.65" W	29° 11' 4.09" N	Cotton Plant	75	352
3	W-12581	FGS	Core	82° 29' 36.62" W	29° 24' 37.11" N	Williston	70	158
4	W-15167	FGS	Core	82° 27' 25.40" W	29° 26' 16.43" N	Williston	70	1184
5	W-15495	FGS	Core	82° 19' 6.03" W	29° 11' 0.36" N	Cotton Plant	75	548
6	W-18798	FGS	Core	82° 19' 16.59" W	29° 1' 53.49" N	Dunnellon SE	60	1207
7	W-18877	FGS	Core	82° 15' 37.55" W	29° 23' 28.97" N	Flemington	183	308
8	ROMP-132	SWFWMD	Core	82° 18' 34.89" W	29° 19' 36.82" N	Fairfield	109	1500
9	W-18894	FGS	Core	82° 28' 58.19" W	29° 9' 0.02" N	Romeo	111	230
10	W-18919	FGS	Core	82° 3' 19.30" W	29° 26' 20.60" N	Citra	63	263.5
11	W-18920	FGS	Core	82° 27' 3.90" W	29° 13' 5.20" N	Romeo	79	127.8
12	W-9449	FGS	Core Chips	82° 20' 50.64" W	29° 23' 45.10" N	Flemington	161	335
13	W-18	FGS	Cuttings	82° 17' 35.40" W	29° 6' 45.88" N	Dunnellon SE	79	6020
14	W-170	FGS	Cuttings	82° 27' 13.60" W	29° 24' 39.75" N	Williston	84	125
15	W-742	FGS	Cuttings	82° 9' 29.06" W	29° 23' 15.13" N	McIntosh	98	690
16	W-937	FGS	Cuttings	82° 16' 8.65" W	29° 14' 8.09" N	Cotton Plant	196	240
17	W-1153	FGS	Cuttings	82° 2' 21.19" W	29° 9' 43.43" N	Ocala East	78	92
18	W-1174	FGS	Cuttings	82° 14' 39.06" W	29° 2' 38.46" N	Shady	90	99
19	W-1183	FGS	Cuttings	82° 22' 40.65" W	29° 2' 25.08" N	Dunnellon	64	73
20	W-1194	FGS	Cuttings	82° 25' 38.64" W	29° 2' 41.08" N	Dunnellon	66	141
21	W-1200	FGS	Cuttings	82° 28' 40.03" W	29° 2' 38.96" N	Dunnellon	40	80
22	W-1699	FGS	Cuttings	82° 27' 4.20" W	29° 23' 13.62" N	Williston	76	158
23	W-1934	FGS	Cuttings	82° 9' 3.67" W	29° 9' 35.08" N	Ocala West	164	185
24	W-2719	FGS	Cuttings	82° 17' 32.64" W	29° 26' 42.11" N	Flemington	138	312
25	W-6104	FGS	Cuttings	82° 6' 40.76" W	29° 24' 6.92" N	Citra	79	63
26	W-7631	FGS	Cuttings	82° 14' 59.65" W	29° 10' 23.09" N	Ocala West	74	160
27	W-8331	FGS	Cuttings	82° 3' 5.40" W	29° 13' 29.37" N	Ocala East	57	97
28	W-8775	FGS	Cuttings	82° 9' 30.96" W	29° 1' 33.66" N	Shady	95	100
29	W-8883	FGS	Cuttings	82° 3' 20.68" W	29° 5' 24.07" N	Belleview	83	520
30	W-10393	FGS	Cuttings	82° 5' 51.06" W	29° 9' 42.06" N	Ocala East	66	600
31	W-10789	FGS	Cuttings	82° 3' 43.67" W	29° 17' 18.09" N	Anthony	76	185
32	W-10950	FGS	Cuttings	82° 27' 51.63" W	29° 21' 6.11" N	Morriston	65	100
33	W-11652	FGS	Cuttings	82° 11' 38.66" W	29° 10' 17.09" N	Ocala West	70	445
34	W-15312	FGS	Cuttings	82° 2' 43.26" W	29° 3' 17.30" N	Belleview	76	240
35	W-15353	FGS	Cuttings	82° 3' 8.27" W	29° 6' 25.84" N	Belleview	79	470
36	W-15643	FGS	Cuttings	82° 14' 8.69" W	29° 1' 33.82" N	Shady	73	500
37	W-16223	FGS	Cuttings	82° 5' 45.67" W	29° 19' 54.09" N	Anthony	75	230
38	W-18289	FGS	Cuttings	82° 3' 45.67" W	29° 25' 53.10" N	Citra	60	115
39	W-17511	FGS	Core	82° 9' 3.66" W	29° 16' 23.09" N	Reddick	82	70
40	ROMP-128	SWFWMD	Core	82° 25' 38.92" W	29° 6' 17.72" N	Dunnellon	50	--
41	W-77	FGS	Cuttings	82° 16' 25.65" W	29° 14' 0.09" N	Cotton Plant	155	920
42	W-171	FGS	Cuttings	82° 29' 5.62" W	29° 23' 34.11" N	Williston	74	114
43	W-173	FGS	Cuttings	82° 21' 1.63" W	29° 27' 37.11" N	Flemington	97	142
44	W-177	FGS	Cuttings	82° 0' 59.46" W	29° 29' 8.02" N	Citra	76	95
45	W-204	FGS	Cuttings	82° 8' 9.40" W	29° 4' 9.81" N	Shady	64	115
46	W-205	FGS	Cuttings	82° 12' 11.67" W	29° 3' 3.08" N	Shady	67	105
47	W-206	FGS	Cuttings	82° 17' 3.66" W	29° 3' 11.08" N	Dunnellon SE	82	125
48	W-207	FGS	Cuttings	82° 20' 52.65" W	29° 3' 0.08" N	Dunnellon SE	64	110
49	W-208	FGS	Cuttings	82° 24' 57.64" W	29° 3' 10.08" N	Dunnellon	61	107
50	W-651	FGS	Cuttings	82° 22' 1.65" W	29° 3' 44.08" N	Dunnellon SE	64	160
51	W-653	FGS	Cuttings	82° 28' 22.10" W	29° 21' 43.57" N	Morriston	70	130
52	W-888	FGS	Cuttings	82° 8' 8.67" W	29° 11' 10.08" N	Ocala West	141	455
53	W-891	FGS	Cuttings	82° 10' 22.49" W	29° 23' 45.03" N	McIntosh	83	370
54	W-892	FGS	Cuttings	82° 10' 27.92" W	29° 18' 36.26" N	Reddick	92	380
55	W-901	FGS	Cuttings	82° 15' 44.65" W	29° 20' 10.10" N	Fairfield	165	4334
56	W-1147	FGS	Cuttings	82° 1' 0.15" W	29° 10' 55.65" N	Ocala East	56	91
57	W-1150	FGS	Cuttings	82° 0' 45.68" W	29° 11' 9.08" N	Ocala East	49	92
58	W-1152	FGS	Cuttings	82° 1' 44.68" W	29° 10' 17.08" N	Ocala East	42	112
59	W-1154	FGS	Cuttings	82° 2' 43.68" W	29° 9' 25.08" N	Ocala East	70	76
60	W-1155	FGS	Cuttings	82° 2' 43.68" W	29° 8' 33.08" N	Ocala East	86	93

Map ID	Well Label	Data Source	Sample Type	Longitude	Latitude	24K Quad	Elevation (feet)	Total Depth (feet)
61	W-1156	FGS	Cuttings	82° 3' 43.68" W	29° 8' 32.08" N	Ocala East	102	82
62	W-1157	FGS	Cuttings	82° 3' 43.68" W	29° 7' 40.08" N	Ocala East	75	83
63	W-1158	FGS	Cuttings	82° 4' 43.68" W	29° 7' 40.08" N	Ocala East	77	55
64	W-1161	FGS	Cuttings	82° 4' 42.68" W	29° 6' 48.08" N	Belleview	70	94
65	W-1163	FGS	Cuttings	82° 6' 40.68" W	29° 5' 3.08" N	Belleview	65	74
66	W-1165	FGS	Cuttings	82° 6' 40.68" W	29° 4' 11.07" N	Belleview	69	77
67	W-1166	FGS	Cuttings	82° 7' 40.67" W	29° 4' 10.08" N	Shady	75	81
68	W-1168	FGS	Cuttings	82° 8' 40.67" W	29° 3' 18.07" N	Shady	73	53
69	W-1169	FGS	Cuttings	82° 9' 39.67" W	29° 3' 18.08" N	Shady	79	88
70	W-1171	FGS	Cuttings	82° 10' 40.03" W	29° 2' 48.20" N	Shady	92	101
71	W-1172	FGS	Cuttings	82° 11' 39.67" W	29° 2' 25.08" N	Shady	71	79
72	W-1173	FGS	Cuttings	82° 13' 40.66" W	29° 2' 23.08" N	Shady	83	91
73	W-1175	FGS	Cuttings	82° 15' 40.66" W	29° 2' 24.08" N	Dunnellon SE	73	81
74	W-1176	FGS	Cuttings	82° 16' 39.66" W	29° 2' 26.08" N	Dunnellon SE	79	87
75	W-1177	FGS	Cuttings	82° 17' 22.25" W	29° 2' 37.01" N	Dunnellon SE	48	57
76	W-1178	FGS	Cuttings	82° 17' 40.66" W	29° 2' 24.08" N	Dunnellon SE	55	53
77	W-1179	FGS	Cuttings	82° 18' 39.65" W	29° 2' 24.08" N	Dunnellon SE	72	72
78	W-1180	FGS	Cuttings	82° 19' 38.08" W	29° 2' 39.11" N	Dunnellon SE	63	72
79	W-1181	FGS	Cuttings	82° 20' 40.65" W	29° 2' 24.08" N	Dunnellon SE	64	72
80	W-1182	FGS	Cuttings	82° 21' 39.65" W	29° 2' 24.08" N	Dunnellon SE	60	69
81	W-1185	FGS	Cuttings	82° 23' 39.65" W	29° 2' 26.08" N	Dunnellon	63	72
82	W-1192	FGS	Cuttings	82° 24' 38.65" W	29° 2' 44.08" N	Dunnellon	64	62
83	W-1193	FGS	Cuttings	82° 23' 37.65" W	29° 2' 54.08" N	Dunnellon	65	86
84	W-1198	FGS	Cuttings	82° 27' 36.64" W	29° 2' 42.09" N	Dunnellon	31	115
85	W-1199	FGS	Cuttings	82° 27' 57.64" W	29° 2' 28.09" N	Dunnellon	37	83
86	W-1369	FGS	Cuttings	82° 3' 28.68" W	29° 7' 27.08" N	Belleview	77	133
87	W-1482	FGS	Cuttings	82° 0' 39.14" W	29° 6' 1.95" N	Belleview	64	4630
88	W-1766	FGS	Cuttings	82° 11' 40.61" W	29° 23' 26.51" N	McIntosh	97	305
89	W-1868	FGS	Cuttings	82° 9' 52.98" W	29° 29' 23.00" N	McIntosh	64	125
90	W-1904 B	FGS	Cuttings	82° 3' 21.05" W	29° 15' 27.07" N	Anthony	69	195
91	W-1919	FGS	Cuttings	82° 5' 0.91" W	29° 5' 22.76" N	Belleview	65	35
92	W-1921	FGS	Cuttings	82° 13' 2.39" W	29° 27' 24.84" N	McIntosh	63	455
93	W-1929	FGS	Cuttings	82° 14' 16.47" W	29° 27' 8.93" N	McIntosh	166	260
94	W-1930	FGS	Cuttings	82° 12' 59.50" W	29° 28' 4.24" N	McIntosh	74	80
95	W-1932	FGS	Cuttings	82° 7' 17.47" W	29° 9' 11.30" N	Ocala East	132	109
96	W-1935	FGS	Cuttings	82° 15' 5.65" W	29° 14' 43.09" N	Cotton Plant	131	108
97	W-1936	FGS	Cuttings	82° 20' 11.64" W	29° 22' 30.10" N	Flemington	142	260
98	W-1965	FGS	Cuttings	82° 5' 15.71" W	29° 17' 23.83" N	Anthony	77	80
99	W-1967	FGS	Cuttings	82° 5' 59.27" W	29° 11' 21.94" N	Ocala East	90	140
100	W-1975	FGS	Cuttings	82° 14' 49.65" W	29° 13' 46.09" N	Ocala West	157	170
101	W-1984	FGS	Cuttings	82° 8' 8.42" W	29° 15' 23.94" N	Reddick	95	90
102	W-2217	FGS	Cuttings	82° 8' 5.51" W	29° 10' 27.19" N	Ocala West	115	105
103	W-2219	FGS	Cuttings	82° 6' 20.79" W	29° 15' 13.49" N	Anthony	77	105
104	W-2569	FGS	Cuttings	82° 7' 45.72" W	29° 11' 56.82" N	Ocala West	74	1080
105	W-2596	FGS	Cuttings	82° 7' 31.53" W	29° 13' 1.60" N	Ocala West	63	175
106	W-3142	FGS	Cuttings	82° 14' 59.64" W	29° 24' 43.70" N	McIntosh	156	110
107	W-3149	FGS	Cuttings	82° 14' 43.65" W	29° 23' 49.10" N	McIntosh	103	70
108	W-3231	FGS	Cuttings	82° 5' 42.67" W	29° 11' 10.08" N	Ocala East	105	215
109	W-3294	FGS	Cuttings	82° 7' 20.57" W	29° 9' 30.59" N	Ocala East	101	120
110	W-3295	FGS	Cuttings	82° 6' 34.75" W	29° 11' 29.58" N	Ocala East	97	110
111	W-3688	FGS	Cuttings	82° 5' 22.67" W	29° 11' 42.08" N	Ocala East	83	190
112	W-3691	FGS	Cuttings	82° 8' 59.45" W	29° 11' 18.48" N	Ocala West	72	165
113	W-3734	FGS	Cuttings	82° 6' 18.02" W	29° 7' 35.22" N	Ocala East	92	86
114	W-3834	FGS	Cuttings	82° 9' 31.01" W	29° 13' 54.66" N	Ocala West	73	110
115	W-4004	FGS	Cuttings	82° 3' 50.63" W	29° 3' 37.02" N	Belleview	84	100
116	W-4009	FGS	Cuttings	82° 26' 29.64" W	29° 2' 36.09" N	Dunnellon	53	39
117	W-4010	FGS	Cuttings	82° 26' 45.64" W	29° 2' 38.09" N	Dunnellon	45	68
118	W-4251	FGS	Cuttings	82° 8' 21.77" W	29° 10' 52.77" N	Ocala West	118	385
119	W-4789	FGS	Cuttings	82° 13' 28.66" W	29° 11' 44.09" N	Ocala West	95	260
120	W-4790	FGS	Cuttings	82° 13' 44.66" W	29° 11' 28.09" N	Ocala West	86	230
121	W-5526	FGS	Cuttings	82° 3' 19.75" W	29° 3' 35.37" N	Belleview	100	205
122	W-5539	FGS	Cuttings	82° 13' 15.66" W	29° 10' 10.09" N	Ocala West	73	90
123	W-5626	FGS	Cuttings	82° 13' 40.65" W	29° 29' 9.11" N	McIntosh	85	56
124	W-5679	FGS	Cuttings	82° 9' 40.66" W	29° 12' 0.09" N	Ocala West	60	145

Map ID	Well Label	Data Source	Sample Type	Longitude	Latitude	24K Quad	Elevation (feet)	Total Depth (feet)
125	W-5766	FGS	Cuttings	82° 9' 38.67" W	29° 11' 9.09" N	Ocala West	75	80
126	W-5789	FGS	Cuttings	82° 0' 37.25" W	29° 0' 19.89" N	Belleview	95	112
127	W-5968	FGS	Cuttings	82° 13' 16.66" W	29° 10' 33.09" N	Ocala West	74	105
128	W-6016	FGS	Cuttings	82° 2' 33.42" W	29° 2' 6.00" N	Belleview	81	80
129	W-6023	FGS	Cuttings	82° 3' 5.92" W	29° 4' 5.44" N	Belleview	69	75
130	W-6260	FGS	Cuttings	82° 12' 0.14" W	29° 22' 33.45" N	McIntosh	85	110
131	W-6473	FGS	Cuttings	82° 10' 55.41" W	29° 11' 19.36" N	Ocala West	70	403
132	W-6915	FGS	Cuttings	82° 6' 33.49" W	29° 17' 24.15" N	Anthony	87	125
133	W-6918	FGS	Cuttings	82° 10' 47.12" W	29° 10' 10.54" N	Ocala West	70	95
134	W-7029	FGS	Cuttings	82° 11' 13.66" W	29° 8' 51.08" N	Ocala West	79	105
135	W-7034	FGS	Cuttings	82° 11' 33.66" W	29° 17' 57.09" N	Reddick	84	185
136	W-7038	FGS	Cuttings	82° 3' 54.55" W	29° 12' 48.09" N	Ocala East	54	115
137	W-7039	FGS	Cuttings	82° 11' 39.66" W	29° 12' 56.09" N	Ocala West	76	177
138	W-7092	FGS	Cuttings	82° 14' 40.65" W	29° 12' 59.09" N	Ocala West	62	134
139	W-7094	FGS	Cuttings	82° 8' 40.67" W	29° 14' 41.09" N	Ocala West	80	60
140	W-7392	FGS	Cuttings	82° 7' 20.96" W	29° 18' 24.13" N	Anthony	78	75
141	W-7529	FGS	Cuttings	82° 11' 0.22" W	29° 5' 50.04" N	Shady	98	155
142	W-7530	FGS	Cuttings	82° 11' 1.82" W	29° 5' 35.43" N	Shady	94	125
143	W-7534	FGS	Cuttings	82° 26' 36.64" W	29° 0' 55.08" N	Dunnellon	110	4490
144	W-7605	FGS	Cuttings	82° 11' 12.66" W	29° 11' 12.09" N	Ocala West	71	150
145	W-7663	FGS	Cuttings	82° 5' 18.68" W	29° 9' 6.08" N	Ocala East	75	200
146	W-7697	FGS	Cuttings	82° 2' 43.69" W	29° 0' 40.07" N	Belleview	97	230
147	W-7744	FGS	Cuttings	82° 10' 28.49" W	29° 9' 43.59" N	Ocala West	77	153
148	W-7841	FGS	Cuttings	82° 14' 48.65" W	29° 24' 23.10" N	McIntosh	100	130
149	W-7899	FGS	Cuttings	82° 24' 57.64" W	29° 7' 38.09" N	Romeo	43	46
150	W-7900	FGS	Cuttings	82° 25' 4.64" W	29° 4' 48.09" N	Dunnellon	50	93
151	W-7902	FGS	Cuttings	82° 18' 6.65" W	29° 6' 23.08" N	Dunnellon SE	80	60
152	W-7903	FGS	Cuttings	82° 19' 6.65" W	29° 4' 12.08" N	Dunnellon SE	97	84
153	W-7904	FGS	Cuttings	82° 19' 6.65" W	29° 3' 7.08" N	Dunnellon SE	61	60
154	W-7905	FGS	Cuttings	82° 19' 11.65" W	29° 1' 4.08" N	Dunnellon SE	60	45
155	W-7907	FGS	Cuttings	82° 10' 12.67" W	29° 7' 43.08" N	Ocala West	100	82
156	W-7908	FGS	Cuttings	82° 9' 28.43" W	29° 4' 0.91" N	Shady	74	80
157	W-7909	FGS	Cuttings	82° 9' 2.61" W	29° 2' 57.70" N	Shady	80	82
158	W-7910	FGS	Cuttings	82° 8' 14.67" W	29° 1' 34.07" N	Shady	79	70
159	W-7912	FGS	Cuttings	82° 4' 47.37" W	29° 9' 16.42" N	Ocala East	68	45
160	W-7913	FGS	Cuttings	82° 2' 56.18" W	29° 8' 18.48" N	Ocala East	90	110
161	W-7915	FGS	Cuttings	82° 6' 8.44" W	29° 11' 11.68" N	Ocala East	108	90
162	W-7916	FGS	Cuttings	82° 4' 55.53" W	29° 13' 15.91" N	Ocala East	50	40
163	W-7917	FGS	Cuttings	82° 0' 26.65" W	29° 10' 40.53" N	Ocala East	61	180
164	W-7988	FGS	Cuttings	82° 10' 11.56" W	29° 11' 30.69" N	Ocala West	81	120
165	W-8009	FGS	Cuttings	82° 7' 26.37" W	29° 22' 46.44" N	Citra	80	105
166	W-8332	FGS	Cuttings	82° 11' 38.66" W	29° 13' 47.09" N	Ocala West	85	155
167	W-8406	FGS	Cuttings	82° 10' 37.66" W	29° 12' 2.09" N	Ocala West	80	130
168	W-8411	FGS	Cuttings	82° 1' 55.70" W	29° 11' 31.93" N	Ocala East	54	192
169	W-8419	FGS	Cuttings	82° 25' 10.64" W	29° 2' 25.08" N	Dunnellon	64	83
170	W-8423	FGS	Cuttings	82° 3' 34.68" W	29° 8' 26.08" N	Ocala East	79	136
171	W-8432	FGS	Cuttings	82° 6' 18.84" W	29° 12' 7.58" N	Ocala East	81	100
172	W-8562	FGS	Cuttings	82° 2' 43.68" W	29° 12' 55.09" N	Ocala East	45	105
173	W-8579	FGS	Cuttings	82° 29' 18.64" W	29° 2' 16.09" N	Dunnellon	56	196
174	W-8581	FGS	Cuttings	82° 3' 9.68" W	29° 9' 55.27" N	Ocala East	80	87
175	W-8770	FGS	Cuttings	82° 12' 51.65" W	29° 25' 3.10" N	McIntosh	120	410
176	W-8771	FGS	Cuttings	82° 17' 51.64" W	29° 24' 52.10" N	Flemington	110	150
177	W-8772	FGS	Cuttings	82° 0' 44.84" W	29° 6' 47.38" N	Belleview	55	140
178	W-8795	FGS	Cuttings	82° 5' 53.87" W	29° 10' 5.31" N	Ocala East	66	140
179	W-10266	FGS	Cuttings	82° 6' 9.75" W	29° 20' 23.97" N	Anthony	97	130
180	W-10268	FGS	Cuttings	82° 8' 24.66" W	29° 21' 6.10" N	Reddick	90	148
181	W-10277	FGS	Cuttings	82° 19' 53.64" W	29° 26' 50.11" N	Flemington	137	615
182	W-10329	FGS	Cuttings	82° 0' 4.69" W	29° 5' 35.07" N	Belleview	90	226
183	W-10350	FGS	Cuttings	82° 5' 42.67" W	29° 12' 2.09" N	Ocala East	34	205
184	W-10391	FGS	Cuttings	82° 27' 49.92" W	29° 0' 33.97" N	Dunnellon	120	450
185	W-10395	FGS	Cuttings	82° 0' 45.68" W	29° 12' 54.08" N	Ocala East	64	160
186	W-10439	FGS	Cuttings	82° 26' 23.47" W	29° 1' 40.21" N	Dunnellon	50	280
187	W-10578	FGS	Cuttings	82° 0' 44.69" W	29° 4' 10.07" N	Belleview	100	158
188	W-10792	FGS	Cuttings	82° 10' 37.66" W	29° 14' 41.09" N	Ocala West	71	125

Map ID	Well Label	Data Source	Sample Type	Longitude	Latitude	24K Quad	Elevation (feet)	Total Depth (feet)
189	W-10796	FGS	Cuttings	82° 26' 37.64" W	29° 1' 51.08" N	Dunnellon	53	90
190	W-10805	FGS	Cuttings	82° 3' 42.68" W	29° 3' 18.07" N	Belleview	87	89
191	W-10849	FGS	Cuttings	82° 14' 51.65" W	29° 23' 15.10" N	McIntosh	190	185
192	W-11189	FGS	Cuttings	82° 3' 43.68" W	29° 11' 10.08" N	Ocala East	85	76
193	W-11190	FGS	Cuttings	82° 25' 36.64" W	29° 4' 28.09" N	Dunnellon	42	140
194	W-11191	FGS	Cuttings	82° 6' 42.67" W	29° 12' 1.09" N	Ocala East	105	87
195	W-11192	FGS	Cuttings	82° 10' 36.66" W	29° 9' 2.08" N	Ocala West	90	150
196	W-11195	FGS	Cuttings	82° 8' 32.47" W	29° 13' 41.86" N	Ocala West	63	93
197	W-11199	FGS	Cuttings	82° 5' 42.67" W	29° 10' 17.08" N	Ocala East	63	160
198	W-11201	FGS	Cuttings	82° 3' 44.12" W	29° 13' 48.30" N	Ocala East	65	120
199	W-11202	FGS	Cuttings	82° 14' 38.65" W	29° 13' 47.09" N	Ocala West	120	121
200	W-11391	FGS	Cuttings	82° 3' 42.68" W	29° 4' 10.07" N	Belleview	80	140
201	W-11392	FGS	Cuttings	82° 10' 40.67" W	29° 5' 1.08" N	Shady	70	200
202	W-11602	FGS	Cuttings	82° 6' 51.66" W	29° 25' 7.10" N	Citra	75	68
203	W-11635	FGS	Cuttings	82° 6' 40.67" W	29° 6' 48.08" N	Belleview	67	67
204	W-11638	FGS	Cuttings	82° 7' 41.67" W	29° 12' 55.09" N	Ocala West	75	131
205	W-11649	FGS	Cuttings	82° 5' 42.68" W	29° 7' 41.08" N	Ocala East	80	90
206	W-11654	FGS	Cuttings	82° 9' 18.87" W	29° 15' 35.20" N	Reddick	76	120
207	W-11655	FGS	Cuttings	82° 11' 40.66" W	29° 9' 25.08" N	Ocala West	80	345
208	W-11673	FGS	Cuttings	82° 6' 42.67" W	29° 8' 32.08" N	Ocala East	76	390
209	W-11703	FGS	Cuttings	82° 10' 40.67" W	29° 0' 38.07" N	Shady	87	256
210	W-11775	FGS	Cuttings	82° 4' 43.67" W	29° 17' 18.09" N	Anthony	68	110
211	W-11813	FGS	Cuttings	82° 27' 33.64" W	29° 0' 56.08" N	Dunnellon	80	184
212	W-11930	FGS	Cuttings	82° 7' 43.67" W	29° 16' 22.09" N	Reddick	70	145
213	W-11932	FGS	Cuttings	82° 11' 41.66" W	29° 15' 57.09" N	Reddick	70	245
214	W-11942	FGS	Cuttings	82° 10' 15.67" W	29° 7' 34.08" N	Ocala West	77	305
215	W-11944	FGS	Cuttings	82° 11' 40.66" W	29° 12' 1.09" N	Ocala West	62	135
216	W-12037	FGS	Cuttings	82° 1' 43.69" W	29° 2' 25.07" N	Belleview	75	162
217	W-12039	FGS	Cuttings	82° 11' 39.66" W	29° 11' 9.09" N	Ocala West	72	120
218	W-12086	FGS	Cuttings	82° 2' 43.68" W	29° 10' 18.08" N	Ocala East	105	190
219	W-12184	FGS	Cuttings	82° 9' 35.66" W	29° 13' 44.09" N	Ocala West	65	142
220	W-12336	FGS	Cuttings	82° 5' 41.68" W	29° 4' 11.07" N	Belleview	78	255
221	W-12490	FGS	Cuttings	82° 5' 41.68" W	29° 5' 55.08" N	Belleview	80	100
222	W-12491	FGS	Cuttings	82° 6' 43.67" W	29° 13' 48.09" N	Ocala East	65	90
223	W-12492	FGS	Cuttings	82° 6' 40.67" W	29° 7' 41.08" N	Ocala East	66	165
224	W-12499	FGS	Cuttings	82° 4' 42.68" W	29° 4' 10.07" N	Belleview	110	100
225	W-12500	FGS	Cuttings	82° 27' 36.64" W	29° 0' 5.08" N	Dunnellon	153	160
226	W-13084	FGS	Cuttings	82° 11' 51.65" W	29° 22' 26.10" N	Reddick	85	141
227	W-13087	FGS	Cuttings	82° 6' 42.67" W	29° 17' 18.09" N	Anthony	84	113
228	W-13142	FGS	Cuttings	82° 10' 36.66" W	29° 16' 26.09" N	Reddick	107	240
229	W-13144	FGS	Cuttings	82° 10' 50.66" W	29° 16' 24.09" N	Reddick	97	260
230	W-16212	FGS	Cuttings	82° 7' 42.67" W	29° 17' 18.09" N	Reddick	90	120
231	W-16215	FGS	Cuttings	82° 10' 37.66" W	29° 15' 34.09" N	Reddick	90	150
232	W-16233	FGS	Cuttings	82° 4' 42.68" W	29° 5' 3.08" N	Belleview	70	80
233	W-16799	FGS	Cuttings	82° 4' 43.67" W	29° 18' 10.09" N	Anthony	75	180
234	W-17483	FGS	Cuttings	82° 9' 32.65" W	29° 28' 37.11" N	McIntosh	68	13
235	W-17780	FGS	Cuttings	82° 7' 37.66" W	29° 28' 37.10" N	McIntosh	60	41
236	W-18274	FGS	Cuttings	82° 3' 21.68" W	29° 3' 5.07" N	Belleview	100	--
237	-111931001	SRWMD	Water Well	82° 27' 15.99" W	29° 29' 16.99" N	Williston	81	--
238	-112033001	SRWMD	Water Well	82° 18' 26.99" W	29° 29' 3.99" N	Flemington	172	--
239	-112035001	SRWMD	Water Well	82° 16' 35.99" W	29° 29' 11.99" N	Flemington	90	--
240	-112132001	SRWMD	Water Well	82° 13' 56.99" W	29° 29' 12.99" N	McIntosh	84	56
241	-112136001	SRWMD	Water Well	82° 9' 47.99" W	29° 29' 3.99" N	McIntosh	61	81
242	-112136002	SRWMD	Water Well	82° 9' 58.99" W	29° 28' 7.99" N	McIntosh	64	125
243	-111835001	SRWMD	Water Well	82° 28' 44.99" W	29° 29' 28.99" N	Williston	102	--
244	-062210003	SRWMD	Water Well	82° 5' 4.99" W	29° 29' 8.99" N	Citra	160	--
245	-062010011	SRWMD	Water Well	82° 17' 29.99" W	29° 28' 47.99" N	Flemington	90	--
246	-082227002	SRWMD	Water Well	82° 4' 49.99" W	29° 28' 40.99" N	Citra	150	--
247	-121812001	SRWMD	Water Well	82° 27' 50.99" W	29° 27' 24.99" N	Williston	74	--
248	-121813001	SRWMD	Water Well	82° 28' 9.99" W	29° 27' 17.99" N	Williston	75	--
249	-121823001	SRWMD	Water Well	82° 29' 21.99" W	29° 25' 41.99" N	Williston	67	--
250	-121826001	SRWMD	Water Well	82° 28' 29.99" W	29° 24' 29.99" N	Williston	71	30
251	-121836001	SRWMD	Water Well	82° 27' 59.99" W	29° 23' 43.99" N	Williston	100	--
252	-121931001	SRWMD	Water Well	82° 26' 53.99" W	29° 24' 8.99" N	Williston	75	--

Map ID	Well Label	Data Source	Sample Type	Longitude	Latitude	24K Quad	Elevation (feet)	Total Depth (feet)
253	-121932001	SRWMD	Water Well	82° 26' 4.99" W	29° 23' 8.99" N	Williston	87	--
254	-121933001	SRWMD	Water Well	82° 24' 59.99" W	29° 23' 19.99" N	Williston	85	--
255	-122016001	SRWMD	Water Well	82° 18' 50.99" W	29° 26' 52.99" N	Flemington	160	--
256	-131801001	SRWMD	Water Well	82° 27' 45.99" W	29° 23' 2.99" N	Williston	85	--
257	-131824001	SRWMD	Water Well	82° 27' 26.99" W	29° 20' 20.99" N	Morriston	60	--
258	-131836001	SRWMD	Water Well	82° 27' 30.99" W	29° 18' 41.99" N	Morriston	65	--
259	-131903001	SRWMD	Water Well	82° 24' 0.99" W	29° 22' 52.99" N	Williston	99	83
260	-131905001	SRWMD	Water Well	82° 26' 15.99" W	29° 23' 14.99" N	Williston	67	--
261	-131906001	SRWMD	Water Well	82° 26' 48.99" W	29° 23' 4.99" N	Williston	74	158
262	-131908001	SRWMD	Water Well	82° 26' 18.99" W	29° 22' 9.99" N	Morriston	67	--
263	-131915001	SRWMD	Water Well	82° 23' 49.99" W	29° 21' 5.99" N	Morriston	93	--
264	-132009001	SRWMD	Water Well	82° 18' 24.99" W	29° 21' 45.99" N	Fairfield	120	--
265	-141814001	SRWMD	Water Well	82° 28' 24.99" W	29° 16' 0.99" N	Morriston	60	84
266	-141824001	SRWMD	Water Well	82° 27' 18.99" W	29° 14' 34.99" N	Romeo	75	--
267	-141907001	SRWMD	Water Well	82° 26' 50.99" W	29° 16' 19.99" N	Morriston	69	75
268	-141919001	SRWMD	Water Well	82° 27' 5.99" W	29° 14' 34.99" N	Romeo	70	--
269	-141931001	SRWMD	Water Well	82° 27' 13.99" W	29° 13' 36.99" N	Romeo	64	--
270	-151810001	SRWMD	Water Well	82° 29' 11.99" W	29° 11' 59.99" N	Romeo	105	--
271	-151813001	SRWMD	Water Well	82° 26' 31.99" W	29° 10' 55.99" N	Romeo	57	--
272	-151823001	SRWMD	Water Well	82° 27' 35.99" W	29° 9' 29.99" N	Romeo	55	--
273	-161801001	SRWMD	Water Well	82° 26' 53.99" W	29° 6' 44.99" N	Dunnellon	56	--
274	-161813001	SRWMD	Water Well	82° 27' 6.99" W	29° 5' 13.99" N	Dunnellon	113	482
275	-161814001	SRWMD	Water Well	82° 27' 20.99" W	29° 5' 37.99" N	Dunnellon	135	--
276	-161827001	SRWMD	Water Well	82° 28' 14.99" W	29° 3' 25.99" N	Dunnellon	52	--
277	-061929002	SRWMD	Water Well	82° 25' 27.99" W	29° 26' 3.99" N	Williston	125	--
278	3-001-005	SJRWMD	Water Well	82° 3' 59.00" W	29° 28' 57.00" N	Citra	81	--
279	810072	SJRWMD	Water Well	82° 15' 25.00" W	29° 29' 33.00" N	Flemington	109	--
280	A-0456	SJRWMD	Water Well	82° 8' 1.00" W	29° 27' 20.00" N	McIntosh	65	--
281	A-0728	SJRWMD	Water Well	82° 4' 37.00" W	29° 26' 42.00" N	Citra	54	--
282	A-0736	SJRWMD	Water Well	82° 4' 3.00" W	29° 26' 54.00" N	Citra	54	--
283	A-0737	SJRWMD	Water Well	82° 3' 31.00" W	29° 27' 30.00" N	Citra	54	--
284	A-0746	SJRWMD	Water Well	82° 4' 2.00" W	29° 26' 44.00" N	Citra	54	--
285	M-0010	SJRWMD	Water Well	82° 7' 30.00" W	29° 5' 49.00" N	Shady	74	--
286	M-0015	SJRWMD	Water Well	82° 8' 13.00" W	29° 13' 2.00" N	Ocala West	59	--
287	M-0016	SJRWMD	Water Well	82° 11' 1.00" W	29° 12' 22.00" N	Ocala West	73	--
288	M-0018	SJRWMD	Water Well	82° 6' 55.00" W	29° 11' 1.00" N	Ocala East	120	--
289	M-0019	SJRWMD	Water Well	82° 7' 52.00" W	29° 10' 18.00" N	Ocala West	103	--
290	M-0052	SJRWMD	Water Well	82° 2' 28.00" W	29° 22' 4.00" N	Anthony	69	--
291	M-0055	SJRWMD	Water Well	82° 8' 29.00" W	29° 20' 21.00" N	Reddick	76	--
292	M-0057	SJRWMD	Water Well	82° 5' 4.00" W	29° 22' 32.00" N	Citra	64	--
293	M-0063	SJRWMD	Water Well	82° 6' 42.00" W	29° 20' 20.00" N	Anthony	95	--
294	M-0072	SJRWMD	Water Well	82° 8' 7.00" W	29° 0' 33.00" N	Shady	70	--
295	M-0074	SJRWMD	Water Well	82° 4' 47.00" W	29° 1' 39.00" N	Belleview	88	--
296	M-0077	SJRWMD	Water Well	82° 9' 6.00" W	29° 2' 0.00" N	Shady	68	--
297	M-0082	SJRWMD	Water Well	82° 4' 33.00" W	29° 3' 36.00" N	Belleview	74	--
298	M-0084	SJRWMD	Water Well	82° 4' 22.00" W	29° 4' 14.00" N	Belleview	104	--
299	M-0085	SJRWMD	Water Well	82° 0' 17.00" W	29° 4' 17.00" N	Belleview	76	--
300	M-0086	SJRWMD	Water Well	82° 8' 27.00" W	29° 12' 39.00" N	Ocala West	49	--
301	M-0093	SJRWMD	Water Well	82° 3' 27.00" W	29° 7' 14.00" N	Belleview	86	--
302	M-0100	SJRWMD	Water Well	82° 4' 39.00" W	29° 9' 7.00" N	Ocala East	82	--
303	M-0101	SJRWMD	Water Well	82° 11' 2.00" W	29° 9' 32.00" N	Ocala West	89	--
304	M-0102	SJRWMD	Water Well	82° 4' 0.00" W	29° 9' 35.00" N	Ocala East	75	--
305	M-0106	SJRWMD	Water Well	82° 2' 55.00" W	29° 10' 5.00" N	Ocala East	72	--
306	M-0107	SJRWMD	Water Well	82° 3' 42.00" W	29° 10' 6.00" N	Ocala East	87	--
307	M-0111	SJRWMD	Water Well	82° 3' 40.00" W	29° 10' 27.00" N	Ocala East	87	--
308	M-0119	SJRWMD	Water Well	82° 2' 48.00" W	29° 11' 16.00" N	Ocala East	103	--
309	M-0122	SJRWMD	Water Well	82° 5' 26.00" W	29° 11' 49.00" N	Ocala East	74	--
310	M-0125	SJRWMD	Water Well	82° 2' 49.00" W	29° 13' 34.00" N	Ocala East	64	--
311	M-0126	SJRWMD	Water Well	82° 5' 12.00" W	29° 13' 41.00" N	Ocala East	64	--
312	M-0127	SJRWMD	Water Well	82° 9' 15.00" W	29° 13' 44.00" N	Ocala West	64	--
313	M-0128	SJRWMD	Water Well	82° 7' 54.00" W	29° 13' 46.00" N	Ocala West	74	--
314	M-0135	SJRWMD	Water Well	82° 7' 34.00" W	29° 17' 25.00" N	Reddick	87	--
315	M-0139	SJRWMD	Water Well	82° 11' 2.00" W	29° 18' 20.00" N	Reddick	90	--
316	M-0141	SJRWMD	Water Well	82° 12' 58.00" W	29° 20' 32.00" N	Reddick	144	--

Map ID	Well Label	Data Source	Sample Type	Longitude	Latitude	24K Quad	Elevation (feet)	Total Depth (feet)
317	M-0147	SJRWMD	Water Well	82° 6' 16.00" W	29° 21' 6.00" N	Anthony	77	--
318	M-0148	SJRWMD	Water Well	82° 11' 43.00" W	29° 21' 28.00" N	Reddick	109	--
319	M-0152	SJRWMD	Water Well	82° 12' 53.00" W	29° 21' 58.00" N	Reddick	93	--
320	M-0154	SJRWMD	Water Well	82° 10' 5.00" W	29° 23' 43.00" N	McIntosh	59	--
321	M-0157	SJRWMD	Water Well	82° 7' 22.00" W	29° 24' 2.00" N	Citra	78	--
322	M-0162	SJRWMD	Water Well	82° 1' 52.00" W	29° 26' 14.00" N	Citra	74	--
323	M-0164	SJRWMD	Water Well	82° 15' 55.00" W	29° 28' 53.00" N	Flemington	176	--
324	M-0205	SJRWMD	Water Well	82° 9' 32.00" W	29° 10' 44.00" N	Ocala West	68	--
325	M-0231	SJRWMD	Water Well	82° 8' 5.00" W	29° 10' 51.00" N	Ocala West	124	--
326	M-0239	SJRWMD	Water Well	82° 7' 26.00" W	29° 11' 49.00" N	Ocala East	94	--
327	M-0244	SJRWMD	Water Well	82° 8' 36.00" W	29° 12' 4.00" N	Ocala West	59	--
328	M-0250	SJRWMD	Water Well	82° 4' 28.00" W	29° 12' 25.00" N	Ocala East	64	--
329	M-0301	SJRWMD	Water Well	82° 4' 3.00" W	29° 11' 5.00" N	Ocala East	99	--
330	M-0302	SJRWMD	Water Well	82° 3' 25.00" W	29° 10' 43.00" N	Ocala East	86	--
331	M-0303	SJRWMD	Water Well	82° 5' 8.00" W	29° 24' 0.00" N	Citra	58	--
332	M-0304	SJRWMD	Water Well	82° 6' 34.00" W	29° 24' 58.00" N	Citra	68	--
333	M-0305	SJRWMD	Water Well	82° 13' 55.00" W	29° 27' 9.00" N	McIntosh	159	--
334	M-0308	SJRWMD	Water Well	82° 1' 30.00" W	29° 8' 41.00" N	Ocala East	64	--
335	M-0345	SJRWMD	Water Well	82° 12' 31.00" W	29° 25' 37.00" N	McIntosh	72	--
336	M-0347	SJRWMD	Water Well	82° 14' 16.00" W	29° 26' 45.00" N	McIntosh	109	--
337	M-0351	SJRWMD	Water Well	82° 12' 51.00" W	29° 27' 0.00" N	McIntosh	63	--
338	M-0355	SJRWMD	Water Well	82° 2' 14.00" W	29° 13' 8.00" N	Ocala East	59	--
339	M-0356	SJRWMD	Water Well	82° 2' 33.00" W	29° 2' 15.00" N	Belleview	91	--
340	M-0361	SJRWMD	Water Well	82° 9' 33.00" W	29° 25' 24.00" N	McIntosh	59	--
341	M-0363	SJRWMD	Water Well	82° 10' 36.00" W	29° 24' 24.00" N	McIntosh	73	--
342	M-0367	SJRWMD	Water Well	82° 13' 17.00" W	29° 26' 22.00" N	McIntosh	158	--
343	M-0368	SJRWMD	Water Well	82° 12' 59.00" W	29° 26' 21.00" N	McIntosh	89	--
344	M-0370	SJRWMD	Water Well	82° 13' 9.00" W	29° 26' 32.00" N	McIntosh	109	--
345	M-0372	SJRWMD	Water Well	82° 13' 8.00" W	29° 26' 5.00" N	McIntosh	131	--
346	M-0374	SJRWMD	Water Well	82° 13' 0.00" W	29° 27' 0.00" N	McIntosh	67	--
347	M-0382	SJRWMD	Water Well	82° 8' 19.00" W	29° 6' 2.00" N	Shady	74	--
348	M-0420	SJRWMD	Water Well	82° 1' 5.00" W	29° 29' 10.00" N	Citra	69	--
349	M-0425	SJRWMD	Water Well	82° 3' 12.00" W	29° 17' 9.00" N	Anthony	67	--
350	M-0428	SJRWMD	Water Well	82° 1' 18.00" W	29° 11' 34.00" N	Ocala East	48	--
351	M-0430	SJRWMD	Water Well	82° 3' 6.00" W	29° 12' 25.00" N	Ocala East	54	--
352	M-0444	SJRWMD	Water Well	82° 5' 48.00" W	29° 8' 25.00" N	Ocala East	118	--
353	M-0447	SJRWMD	Water Well	82° 7' 0.00" W	29° 24' 15.00" N	Citra	84	--
354	M-0452	SJRWMD	Water Well	82° 7' 27.00" W	29° 13' 21.00" N	Ocala East	74	--
355	M-0457	SJRWMD	Water Well	82° 4' 48.00" W	29° 1' 55.00" N	Belleview	106	--
356	M-0518	SJRWMD	Water Well	82° 14' 37.00" W	29° 6' 31.00" N	Shady	84	--
357	M-0528	SJRWMD	Water Well	82° 3' 43.00" W	29° 8' 23.00" N	Ocala East	89	--
358	M-0529	SJRWMD	Water Well	82° 11' 51.00" W	29° 25' 20.00" N	McIntosh	59	--
359	NPN21	SJRWMD	Water Well	82° 6' 11.00" W	29° 27' 13.00" N	Citra	69	--
360	62	SWFWMD	Water Well	82° 26' 50.34" W	29° 0' 41.91" N	Dunnellon	108.19	36
361	360	SWFWMD	Water Well	82° 15' 23.33" W	29° 2' 15.91" N	Dunnellon SE	76.97	51
362	382	SWFWMD	Water Well	82° 12' 8.32" W	29° 2' 38.91" N	Shady	64.7	65
363	387	SWFWMD	Water Well	82° 28' 36.35" W	29° 3' 25.90" N	Dunnellon	80.92	115
364	467	SWFWMD	Water Well	82° 28' 40.35" W	29° 2' 13.90" N	Dunnellon	44.28	78
365	1122	SWFWMD	Water Well	82° 12' 57.33" W	29° 19' 10.88" N	Reddick	170	186
366	1123	SWFWMD	Water Well	82° 24' 39.34" W	29° 5' 45.89" N	Dunnellon	45	155
367	1124	SWFWMD	Water Well	82° 14' 43.34" W	29° 15' 55.89" N	Reddick	70	84
368	1126	SWFWMD	Water Well	82° 28' 14.35" W	29° 6' 13.89" N	Dunnellon	55	--
369	1131	SWFWMD	Water Well	82° 26' 22.35" W	29° 12' 6.88" N	Romeo	55	--
370	1132	SWFWMD	Water Well	82° 21' 17.34" W	29° 8' 29.90" N	Cotton Plant	100	--
371	1134	SWFWMD	Water Well	82° 14' 14.33" W	29° 5' 15.90" N	Shady	80	80
372	1142	SWFWMD	Water Well	82° 21' 29.34" W	29° 13' 54.91" N	Cotton Plant	65	85
373	1144	SWFWMD	Water Well	82° 26' 59.35" W	29° 4' 10.90" N	Dunnellon	50	--
374	1145	SWFWMD	Water Well	82° 17' 39.34" W	29° 19' 25.90" N	Fairfield	140	185
375	1149	SWFWMD	Water Well	82° 25' 24.35" W	29° 8' 45.88" N	Romeo	70	106
376	1150	SWFWMD	Water Well	82° 27' 19.35" W	29° 8' 55.89" N	Romeo	60	243
377	1151	SWFWMD	Water Well	82° 23' 9.34" W	29° 5' 10.90" N	Dunnellon	70	--
378	1155	SWFWMD	Water Well	82° 14' 52.33" W	29° 11' 52.92" N	Ocala West	85	--
379	1158	SWFWMD	Water Well	82° 17' 14.35" W	29° 25' 40.89" N	Flemington	120	105
380	1159	SWFWMD	Water Well	82° 17' 44.34" W	29° 8' 45.91" N	Cotton Plant	75	85

Map ID	Well Label	Data Source	Sample Type	Longitude	Latitude	24K Quad	Elevation (feet)	Total Depth (feet)
381	1160	SWFWMD	Water Well	82° 15' 18.34" W	29° 22' 25.90" N	Fairfield	140	90
382	1161	SWFWMD	Water Well	82° 18' 39.86" W	29° 27' 6.93" N	Flemington	150	16
383	1162	SWFWMD	Water Well	82° 14' 26.33" W	29° 17' 40.88" N	Reddick	160	145
384	1166	SWFWMD	Water Well	82° 23' 9.34" W	29° 6' 20.91" N	Dunnellon	70	--
385	1168	SWFWMD	Water Well	82° 10' 56.32" W	29° 0' 27.91" N	Shady	85	95
386	1171	SWFWMD	Water Well	82° 21' 39.35" W	29° 24' 20.90" N	Flemington	130	120
387	1174	SWFWMD	Water Well	82° 13' 26.33" W	29° 13' 22.89" N	Ocala West	85	120
388	1341	SWFWMD	Water Well	82° 22' 53.34" W	29° 1' 27.91" N	Dunnellon	60	1000
389	1342	SWFWMD	Water Well	82° 20' 22.34" W	29° 9' 4.92" N	Cotton Plant	75	88
390	1343	SWFWMD	Water Well	82° 20' 15.34" W	29° 4' 48.91" N	Dunnellon SE	85	204
391	1345	SWFWMD	Water Well	82° 20' 36.34" W	29° 3' 27.91" N	Dunnellon SE	50	80
392	1348	SWFWMD	Water Well	82° 27' 19.36" W	29° 8' 55.90" N	Romeo	60	143
393	1349	SWFWMD	Water Well	82° 25' 54.34" W	29° 5' 18.90" N	Dunnellon	100	60
394	1350	SWFWMD	Water Well	82° 26' 59.36" W	29° 4' 10.91" N	Dunnellon	70	--
395	1351	SWFWMD	Water Well	82° 27' 43.35" W	29° 11' 54.89" N	Romeo	100	--
396	2224	SWFWMD	Water Well	82° 18' 53.69" W	29° 1' 58.09" N	Dunnellon SE	52.86	216
397	2492	SWFWMD	Water Well	82° 23' 43.63" W	29° 15' 48.54" N	Morriston	--	--
398	2496	SWFWMD	Water Well	82° 11' 38.90" W	29° 9' 5.80" N	Ocala West	--	180
399	2502	SWFWMD	Water Well	82° 24' 41.32" W	29° 7' 13.58" N	Dunnellon	--	--
400	2507	SWFWMD	Water Well	82° 25' 9.89" W	29° 6' 17.05" N	Dunnellon	--	--
402	11582	SWFWMD	Water Well	82° 22' 9.34" W	29° 9' 35.90" N	Cotton Plant	100	180
403	11586	SWFWMD	Water Well	82° 19' 54.34" W	29° 7' 55.90" N	Cotton Plant	90	105
401	10721	SWFWMD	Water Well	82° 27' 47.35" W	29° 6' 14.90" N	Dunnellon	110.6	137
404	11729	SWFWMD	Water Well	82° 22' 14.36" W	29° 27' 26.88" N	Flemington	110	110
405	11730	SWFWMD	Water Well	82° 15' 34.33" W	29° 4' 15.91" N	Dunnellon SE	90	100
406	11779	SWFWMD	Water Well	82° 20' 48.34" W	29° 5' 17.90" N	Dunnellon SE	--	180
407	11780	SWFWMD	Water Well	82° 19' 52.34" W	29° 4' 24.91" N	Dunnellon SE	--	170
408	11783	SWFWMD	Water Well	82° 14' 14.32" W	29° 0' 40.92" N	Shady	--	50
409	11784	SWFWMD	Water Well	82° 16' 26.34" W	29° 17' 18.89" N	Fairfield	--	200
410	11785	SWFWMD	Water Well	82° 29' 29.35" W	29° 3' 45.90" N	Dunnellon	--	161
411	11786	SWFWMD	Water Well	82° 17' 32.33" W	29° 9' 9.90" N	Cotton Plant	--	150
412	11787	SWFWMD	Water Well	82° 17' 32.34" W	29° 9' 9.90" N	Cotton Plant	--	150
413	11788	SWFWMD	Water Well	82° 14' 14.33" W	29° 6' 35.91" N	Shady	--	105
414	11790	SWFWMD	Water Well	82° 15' 9.33" W	29° 12' 12.90" N	Cotton Plant	--	105
415	11791	SWFWMD	Water Well	82° 29' 44.35" W	29° 7' 40.90" N	Romeo	--	160
416	11857	SWFWMD	Water Well	82° 20' 44.34" W	29° 7' 10.90" N	Dunnellon SE	90	90
417	11858	SWFWMD	Water Well	82° 25' 36.34" W	29° 2' 10.91" N	Dunnellon	50	82
418	11859	SWFWMD	Water Well	82° 19' 2.33" W	29° 0' 38.92" N	Dunnellon SE	50	65
419	27703	SWFWMD	Water Well	82° 25' 56.10" W	29° 15' 49.93" N	Morriston	--	--

*NOTE: Suwannee River Water Management District (SRWMD) **Well Label** is the well's township, range, and section location. The format is as follows: + or – indicates township north (+) versus south (-); there is no need to include an east / west indicator for the range, as the entire SRWMD is east of the Prime Meridian. Following the +/- are 6 digits representing the township, range, and section (TTRRSS), and finally a 3 digit unique identifier assigned consecutively to each well within a given section to differentiate wells with the same +/- and 6 digit number.

For example: **-031224004** means Township 03 South, Range 12 East, Section 24, unique well 004.