OPEN FILE REPORT 7

Geology of Sumter County

by
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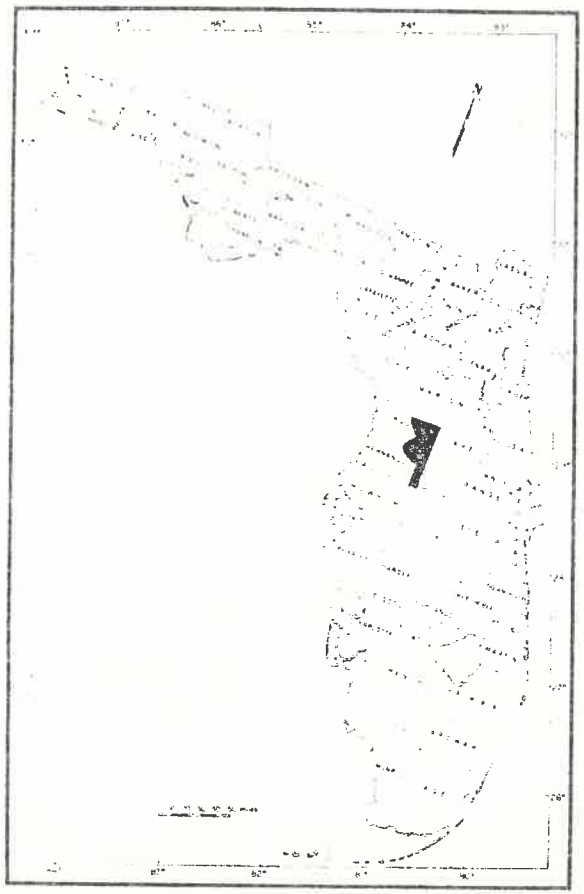
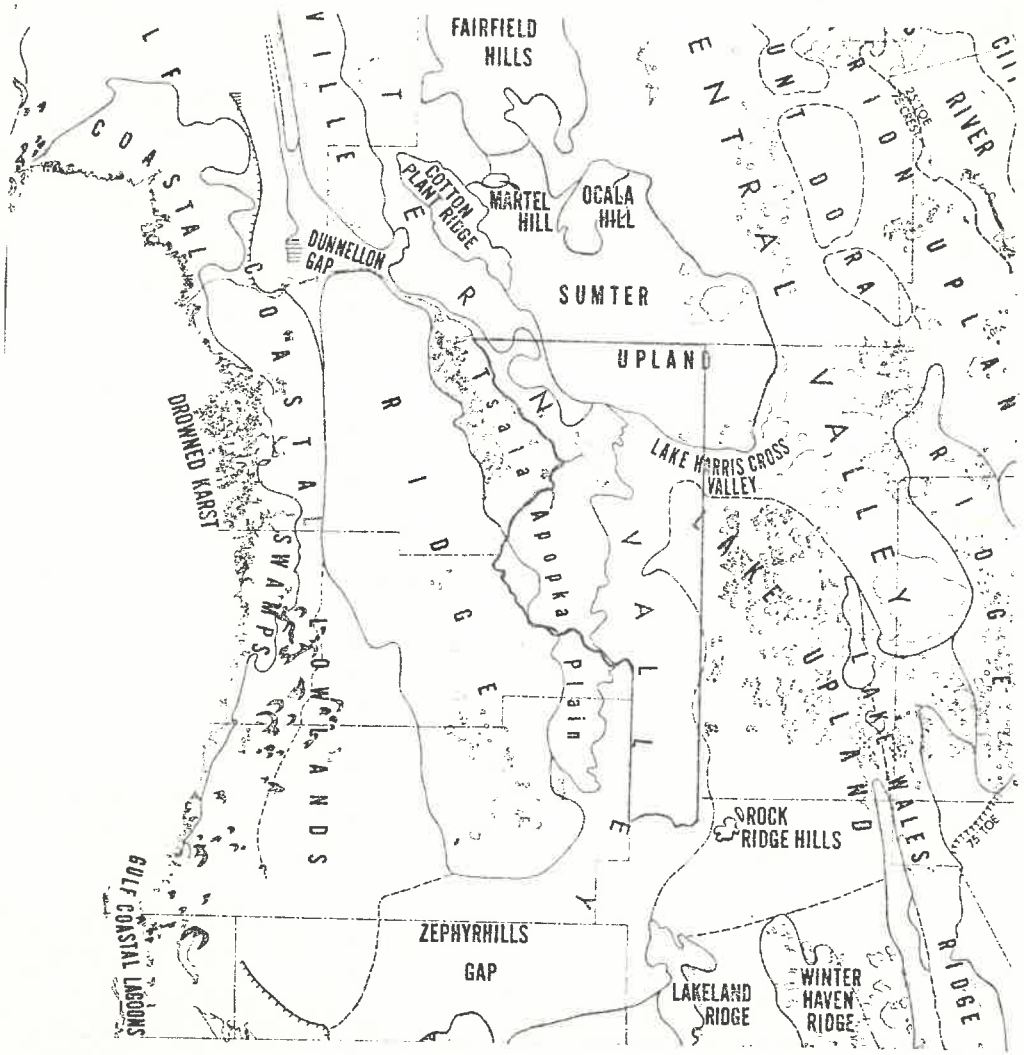
Tallahassee, Florida

1984



Location Map



Physiographic MAP of Sumter County and surrounding AREA (White, 1970).

PHYSIOGRAPHY

Several authors have discussed the physiography of the Florida peninsula. For the purposes of this report, White's (1970) classification will be utilized. The majority of Sumter County lies within the Western Valley and Tsala Apopka Plain. Other major physiographic features of Sumter County include the Sumter and Lake uplands (figure 1).

Western Valley

The Western Valley is a large irregularly shaped low area which is bounded on the west by the Brooksville Ridge and on the east by the Sumter and Lake uplands. The Western Valley is connected to the Central Valley by the Lake Harris Cross Valley. The Lake Harris Cross Valley is an east-west trending gap separating the Sumter and Lake uplands. Elevations within the Western Valley range from approximately 40-100 feet.

Tsala Apopka Plain

The boundaries of the Tsala Apopka Plain are the Brooksville Ridge on the west and the Withlacoochee River on the east. The plain forms the lowest and flattest portion of the Western Valley (White, 1970). Tsala Apoka Lake occupies the northern portion of the plain. Elevations range from approximately 40 feet (Tsala Apopka Lake) to about 75 feet. Tsala Apopka Lake is thought to be a relict of a much larger lake which occupied most of the Tsala Apopka Plain (White, 1958).

Brooksville Ridge

The Brooksville Ridge forms the western boundary of the Western Valley. The ridge is present only in a small portion of west central Sumter County in the vicinity of Nobleton. The Brooksville Ridge trends north to south and has elevations which range from 70-200 feet. The southern part of the ridge runs through central Citrus, Hernando, and Pasco counties, to the west of Sumter County.

The Brooksville Ridge is composed of a core of limestone which is overlain by clayey sands, sandy clays and clays which are in turn overlain by Pleistocene sands. The clays and clayey sediments have limited downward percolation of ground water, thus limiting the amount of dissolution of the limestone core of the ridge. The result is that the Brooksville Ridge stands high relative to the Western Valley and the Tsala Apopka Plain.

Sumter & Lake Uplands

The Sumter and Lake uplands occupy the northeastern corner and part of the eastern boundary of Sumter County. The two uplands are separated by the Lake Harris Cross Valley. In general, the elevation of the two uplands decreases in a northerly direction. Elevations within Sumter County range approximately from 50-100 feet in the northern part and approximately 75-140 feet in the southern part.

The Sumter and Lake uplands are similar to the Brooksville Ridge in composition: a limestone core overlain by clayey sediments, in turn overlain by Pleistocene sands. Dissolution of of limestone has been limited by the clayey sediments resulting in the relatively high elevations.

STRATIGRAPHY

Surface and near surface sediments in Sumter County consist of quartz sand, clay, peat, limestone and dolomite. The sediments discussed below range in age from Middle Eocene (40-45 million years ago) to Holocene (10,000 years ago to present).

Eocene Series

Avon Park Limestone

The Middle Eocene Avon Park Limestone is the oldest formation to crop out in Florida. The Avon Park is present in the subsurface throughout Sumter County, but is not exposed within the county.

Within Sumter County, the Avon Park may be either limestone or dolomite. Generally the uppermost 30-70 feet of the formation consists of limestone, underlain predominantly by dolomite or dolomitic limestone. The limestone of the Avon Park typically is white, cream or brown in color, poorly to well indurated, calcilutite (clay and silt sized) to very fine grained. The limestone may be thin bedded to relatively structureless and commonly contains organic material as flecks and thin seams. Where the formation is dolomitized it is microcrystalline to fine grained, unconsolidated to well indurated, euhedral to subhedral dolomite crystals.

The Avon Park Limestone unconformably underlies the Ocala Group throughout the county, with the possible exception of two small areas. Vernon (1951) mapped two areas, one north of Center Hill, the other southeast of Webster,

where the Ocala Group has been removed. Supporting data, however, is limited and the configuration of these areas is unknown. In these areas the Avon Park Limestone is overlain unconformably by Miocene to Holocene clastic sediment.

Characteristic fossil groups found in the Avon Park Limestone include echinoids, foraminifera, bryozoa, molluscs, and corals. These groups are indications of a shallow marine depositonal environment.

Ocala Group

The Ocala Group consists three formations, which in ascending order are, the Inglis, Williston and Crystal River formations. For the purposes of this report, the Inglis and Williston are not differentiated. These two formations are discussed as the lower Ocala Group. Essentially all of Sumter County is underlain by limestone of the Ocala Group.

Lower Ocala Group

The lower Ocala Group in Sumter County is a white to cream or tan colored, granular and variably chalky or recrystallized limestone. Where not extensively recrystallized, the lower Ocala is a poorly to well indurated calcarenite composed in large part of miliolid foraminifera. Cement may be either calcite or dolomite. The lower portion is commonly dolomitized. Dolomitic sections consist of poorly to well indurated microcrystalline (silt sized) to very fine grained, euhedral dolomite crystals.

The lower Ocala limestone is abundantly fossiliferous, commonly forming a foraminiferal coquina. The most common fossils include miliolid foraminifera, other foraminifera, molluscs and echinoids.

Limestone of the lower Ocala forms the bedrock in the Tsala Apopka Plain area of northern and western Sumter County. The lower Ocala unconformably overlies the Middle Eocene Avon Park Limestone and conformably underlies the Crystal River Formation where that formation has not been removed by erosion. The boundary between the Crystal River and the lower Ocala is transitional. Where the Crystal River Formation has been removed by erosion, the lower Ocala is overlain by Miocene to Holocene clastic sediments.

Crystal River Formation

The general lithology of the Crystal River Formation is described by Vernon (1951) as a white or cream colored, soft, very massive, friable coquina of large foraminifera set in a pasty calcite (calcilutite) matrix. In southern Sumter County, the calcilutite matrix becomes predominant.

The Crystal River Formation is abundantly fossiliferous, commonly forming a coquina of large foraminifera. The most common fossil types include foraminifera (large and small) echinoids, molluscs, bryozoa and oysters.

The Crystal River is conformably and gradationally underlain by the lower Ocala. In Sumter County, the Crystal River Formation is unconformably overlain by Miocene to Holocene clastic sediments. The Crystal River forms the bedrock in Sumter County wherever it is present.

Miocene to Holocene Series

Undifferentiated surficial sands and clays

The surficial sediments throughout most of Sumter County consist of quartz sand, clayey sand and clays. The thickness of these surficial sediments ranges from just a few feet to almost 100 feet thick.

The Oligocene age (23.7-35.6 million years ago) Suwannee Limestone, which overlies the Ocala Group throughout much of peninsular Florida is not present in Sumter County. If the formation was originally deposited in the area, it has since been removed by erosion. The Miocene Hawthorn Group sediments have also been removed by erosion. Some of the undifferentiated sediments (quartz sands and clays) are phosphatic and are considered to be residual material of the Hawthorn Group (Scott, personal communication 1984). Previous authors have assigned these materials to either the Hawthorn or Alachua formations (Cooke, 1945; Vernon, 1951).

The general lithology of the undifferentiated surficial sediments is variable from fine to coarse grained sand to clayey sand, sandy clay and clay. Clay content generally increases downward. Limestone and phosphatic limestone fragments are often found in the lower part. Peat or organic rich sediments are found at the surface in some parts of the county.

ECONOMIC GEOLOGY

Stone

Crushed limestone is the major mineral commodity produced in Sumter County. The several companies in operation within the county are mining predominantly from the late Eocene Crystal River Formation. These quarries are located in the central portion of the county.

All limestone mined in the county is mined from open pit quarries. Generally, overburden must be removed by bulldozers prior to mining. In some areas, the limestone is soft enough that bulldozers equipped with a claw can rip the rock loose. If harder rock is encountered, drilling and blasting are necessary to fracture the rock. Where mining extends below the water table and pits remain flooded, draglines are utilized in mining. After mining, the

material is transported by truck to processing plants to be crushed and stockpiled. The primary products produced are dense road base material and agricultural lime.

Peat

Two companies are currently mining peat from Holocene age deposits within Sumter County. These deposits are located east of Oxford near the Lake County boundary and near the Withlacoochee River southwest of Tarrytown.

Mining is accomplished by clearing the surface of vegetation, pumping to dewater the peat, then excavating the peat with a dragline. The peat is then shredded and stockpiled to dry. All of the peat produced is utilized for various horticultural purposes such as landscaping and potting soils, although some of the peat is suitable for energy applications.

REFERENCES

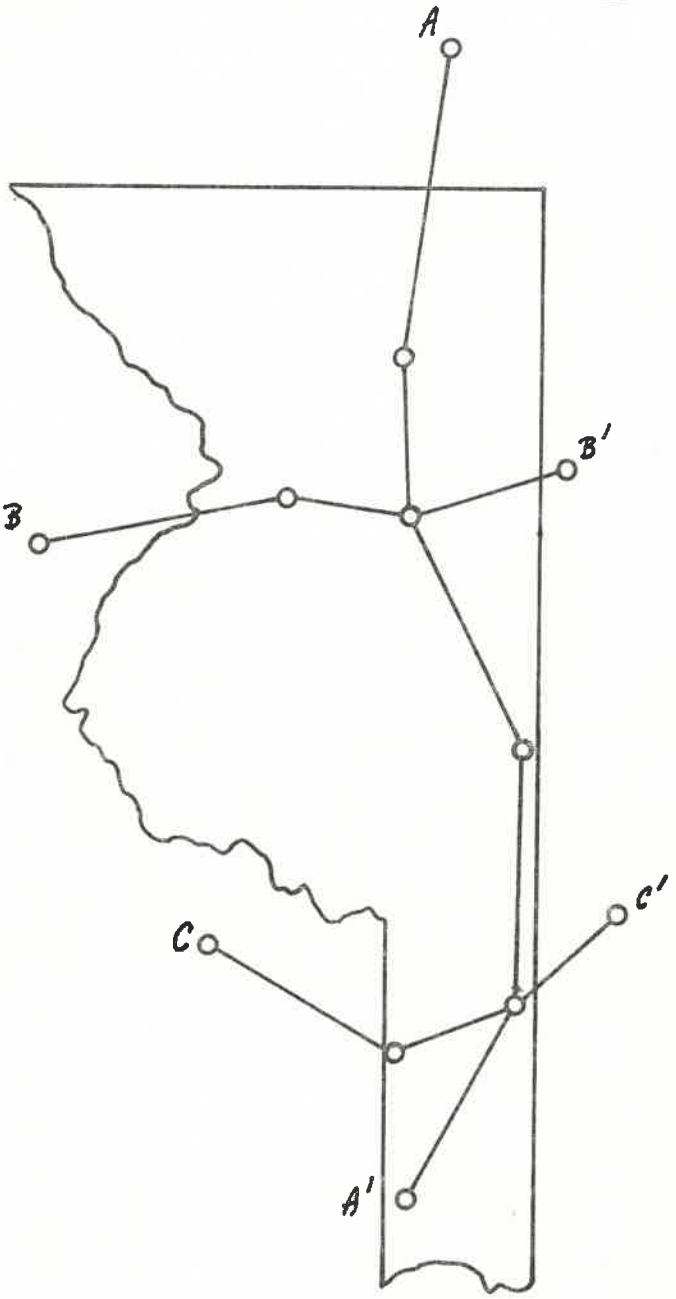
Cooke, C. W., 1945, Geology of Florida, Florida Geological Survey Bulletin 29, 345 p.

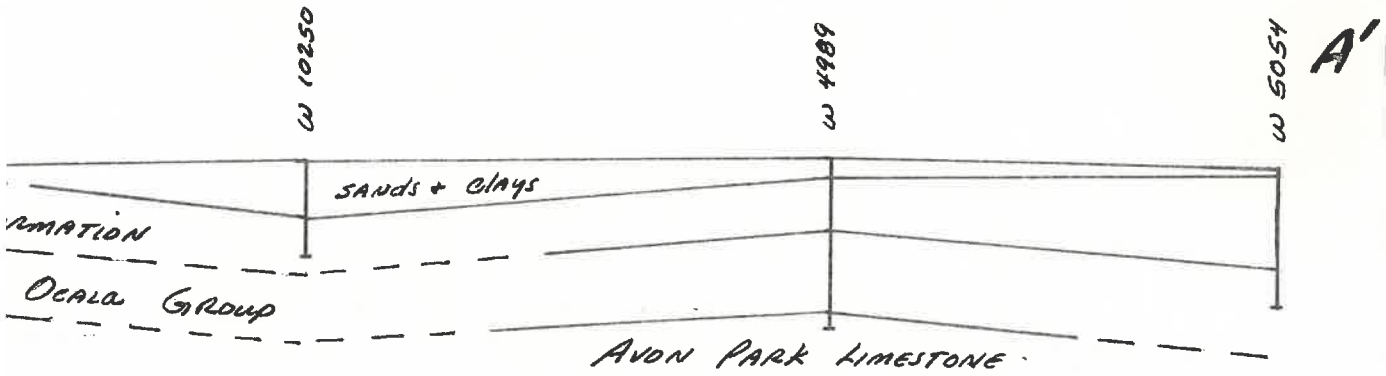
Vernon, R. O., 1951, Geology of Citrus and Levy Counties, Florida, Florida Geological Survey Bulletin 33, 256 p.

White, W.A., 1958, Some Geomorphic Features of Central Peninsular Florida, Florida Geological Survey Bulletin 41, 92 p.

_____, 1970, The Geomorphology of the Florida Peninsula, Florida Bureau of Geology Geological Bulletin 51, 164 p.

Cross Section Location Map

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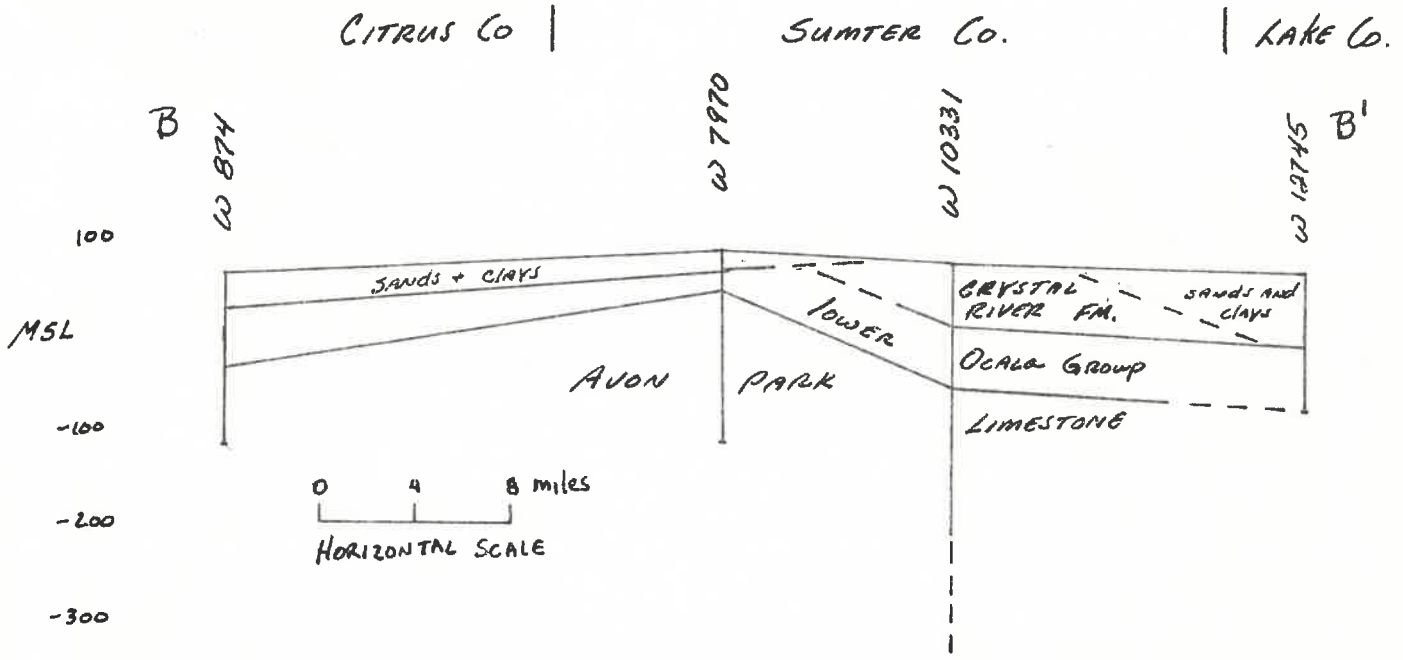
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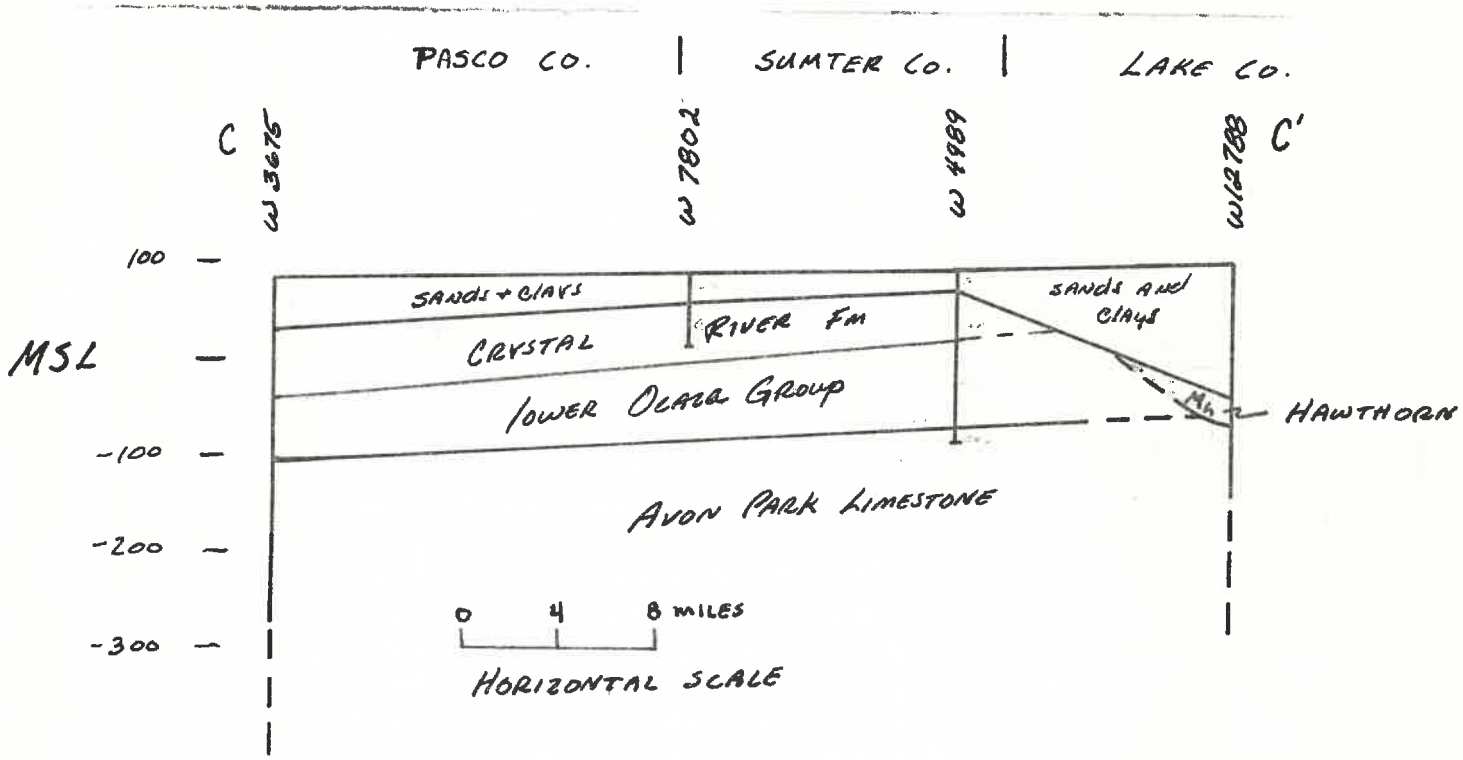
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