South Florida Geological Site Guide series
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No. 06

ARTESIAN WELL AT JOHN PENNEKAMP STATE PARK, KEY LARGO

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Location and access

Enter the Keys on US 1 and travel SW through Key Largo. The entrance to John Pennekamp State Park is on the left. Entance fees can be waved for educational groups. Call 305-452-1202 (a.m. is best) to ask for waivers.

After entering the Park, turn right and park in the areas close to the boat ramps. Follow the trail to the camp site. The Artesian well is on the left, in the mangroves, about 100 yards before the camp site. It is a vertical pipe surrounded by a 2 meter high stone structure.

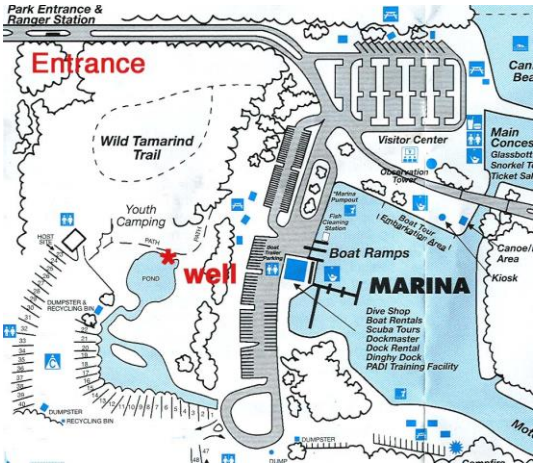

Fig 1. Location of the Artesian well (not to scale).

What there is to see

A discharging artesian well that taps into the sulfurous Floridan aquifer. Artesian wells are those where the water rises to the surface without pumping due to pressure within the aquifer.

Background

The well was drilled to a depth of 1,333 feet in 1965 to test the waters if the deep Floridan aquifer could be used as a water source for the groundwater-poor Florida Keys.
[Note that in the wet season (June through October) if rainfall has been particularly heavy, the Park may cap the well in order to prevent flooding in the Park campgrounds.]

Discharging water

Observations
The water discharges from the vertical pipe into a sluice on the surrounding stone structure , and from there enters the campsite pond. The discharge is about X gallons/min. The unpleasant odor of hydrogen sulfide is very noticeable, as is the white sulfur deposits on the sluice. If you taste the water, it is quite saline (about one sixth as saline as sea water).

Interpretation

The Floridan is exposed at the surface in the area to the north of Tampa. There the water table is several tens of feet above sea level.. At Key Largo the top of the Floridan aquifer is at about 1000 feet and is overlain by several impermeable layers that prevent the groundwater from reaching the surface. When these layers were penetrated by the well boring, the Floridan groundwater rises driven by the difference in height between the water table north of Tampa and the height of the well (only a few feet above sea level). The rocks of the Floridan aquifer contain many sulfurous minerals which have contributed a high content of dissolved sulfur in the water.

Figure 2 Discharge at the well, June 2004

References and further reading

Harrison, R.S., and Coniglio, M., 1985 Origin of the Pleistocene Key Largo Limestone, Florida Keys, Bulletin of Canadian Petroleum Geology, v. 33(3), p. 350-358.
Hoffmeister, J. E.., 1974, Land from the sea: The geologic story of south Florida, University of Miami Press, 143pp.
Hoffmeister, J. E. and Multer, H. G., 1968, Geology and origin of the Florida Keys, Geological Society of America Bulletin, v. 79, p. 1487-1502.