



February 9th, 2017

RE: WRAC Report, agenda #8

South Florida Water Management District
Governing Board Members
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Dear Chairman Dan O'Keefe,

After attending the WRAC meeting February 2nd 2017 we had real concerns that the SFWMD is perusing temporary solutions to a problem that needs permanent long term solutions.

We know from years of scientific study on CERP that water storage, treatment, and conveyance in the EAA is the best option to reduce damaging discharges to the northern estuaries and to improve dry season flows of clean water south. We cannot afford to throw away water that could otherwise be used for restoration, we have been in persistent drought conditions for 11 of the last 17 years, and this year is no different.

Page 2-3 of this letter is a list of some of the studies that have been conducted on the issue of deep-well injection, we want to be sure as you and your staff are aware of all of the information on this subject as we understand from the WRAC meeting you are currently reviewing this as an option to discard polluted water. Many of the results of these studies raise doubts and concerns regarding the efficacy of the middle confining unit and the resultant water quality impact to the overlying aquifers. This can put other users in jeopardy of contamination.

We would like you to review this information as we remain concerned about this proposed "temporary fix". Friends of the Everglades wants to see real restoration and that will require cleaning up the polluted water and sending it south, and being able to do that in the dry season when the southern estuaries need it the most.

We know that a southern reservoir would reduce discharges by almost 50%, with the added benefit of sending water south when it is needed to the Everglades, Biscayne Bay and Florida Bay. A northern reservoir by contrast would only reduce the discharges by about 6%.

We are looking for you and your staff to consider all the science and prioritize projects that reduce damaging discharges as state law requires you to do.

There are no other Everglades in the world. They are, they have always been, one of the unique regions of the earth; remote, never wholly known. Nothing anywhere else is like them. - MARJORY STONEMAN DOUGLAS

We look forward to continued discussions on real solutions to the persistent water quality concerns we all face and would be glad to meet with you and your staff to discuss our concerns.

Sincerely,



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(1) Ronald Reese (USGS Florida Integrated Science Center) & Emily Richardson (South Florida Water Management District, *Scientific Investigations Report 2007-5207, Synthesis of the Hydrogeologic Framework of the Floridan Aquifer System and Delineation of the Major Avon Park Permeable Zone in Central and Southern Florida*, 2008. This study synthesized previous studies on the Floridan aquifer system in central and southern Florida and introduced a revised regional hydrogeologic framework. It identified the depths and thicknesses of the underlying bedrock for the entire State of Florida.

(2) Virginia Walsh & René M. Price, *Determination of Vertical and Horizontal Pathways of Injected Fresh Wastewater Into a Deep Saline Aquifer (Florida, USA) Using Natural Chemical Tracers*, *Hydrogeology Journal*, 18(4): 1027-1042 (2009). This study was conducted by the Miami-Dade Water and Sewer Department for the South District Wastewater Treatment Plant (SDWWTP). It evaluated well logs and water chemistry data at the SDWWTP. Turkey Point FEIS 5-25. This study concluded that deep well injection into the Boulder Zone contaminated the Floridan Aquifer as a result of unintended vertical and horizontal migration of municipal wastewater into the aquifer from nine injection wells.

(3) K. Cunningham (USGS) et al., *Near-Surface, Marine Seismic-Reflection Data Define Potential Hydrogeologic Confinement Bypass in the Carbonate Floridan Aquifer System*,

Southeastern Florida, Society of Exploration Geophysics Annual Meeting, 2012. This study was conducted to determine whether the bedrock formations were true confining layers that could protect underground sources of drinking water. Cunningham at 1. The study acquired approximately 210 kilometers of marine seismic-reflection data in an area just north of the Turkey Point site between 2007 and 2011. It produced a high-resolution data set that provides an opportunity to evaluate geologic structures that cut across confining units of the carbonate rocks forming the Floridan aquifer system. The Cunningham study identify linear tectonic faults and karst collapse structures near the Turkey Point site. Turkey Point FEIS 5-25. Cunningham found tectonic faults and karst collapse features, structural systems that “may serve as pathways for vertical groundwater flow across relatively low-permeability carbonate strata that separate zones of regionally extensive high-permeability rocks in the Floridan aquifer system.” Cunningham at 4.

(4) Idaho National Engineering and Environmental Laboratory, *Evaluation of Confining Layer Integrity Beneath the South District Wastewater Treatment Plant, Miami-Dade Water and Sewer Department, Dade County, Florida*, INEEL/EXT-2001-00046, Idaho Falls, Idaho (2001). This study reviewed the existing information on the geology, hydrogeology, and geochemistry at the SDWWTP. Turkey Point FEIS 5-23. It determined that groundwater in the Upper Floridan Aquifer is contaminated with treated wastewater, which implies that contaminants are migrating through the Middle Confining Unit. Idaho National Engineering and Environmental Laboratory, *Evaluation of Confining Layer Integrity Beneath the South District Wastewater Treatment Plant, Miami-Dade Water and Sewer Department, Dade County, Florida*, INEEL/EXT-01-0046 (2001) at ¶¶ 38-40. Furthermore, the INEEL study concluded that “the geologic data provided for review are not sufficient to demonstrate that the Middle Confining Unit is a competent, low hydraulic conductivity layer that is capable of preventing upward migrations of fluids from the Boulder Zone into the overlying underground source of drinking water.”

(5) R.G. Maliva et al., *Vertical Migration of Municipal Wastewater in Deep Injection Well Systems, South Florida, USA*, 2007. This study focused on deep well injection in South Florida in recognition of the fact that “the greatest potential risk to public health associated with deep injection wells in South Florida is vertical migration of wastewater, containing pathogenic microorganisms and pollutants, into brackish-water aquifer zones that are being used for alternative water-supply projects such as aquifer storage and recovery.” It studied vertical hydraulic conductivity data from core plugs from the Middle Confining Unit at twenty-nine South Florida injection well sites, including the SDWWTP.

cc: Robert Verrastro, Lead Hydrogeologist, Water Resources and Matt Morrison, Federal Policy Chief, Everglades Policy and Coordination, Provided to Lake O PDT 2/15/2017