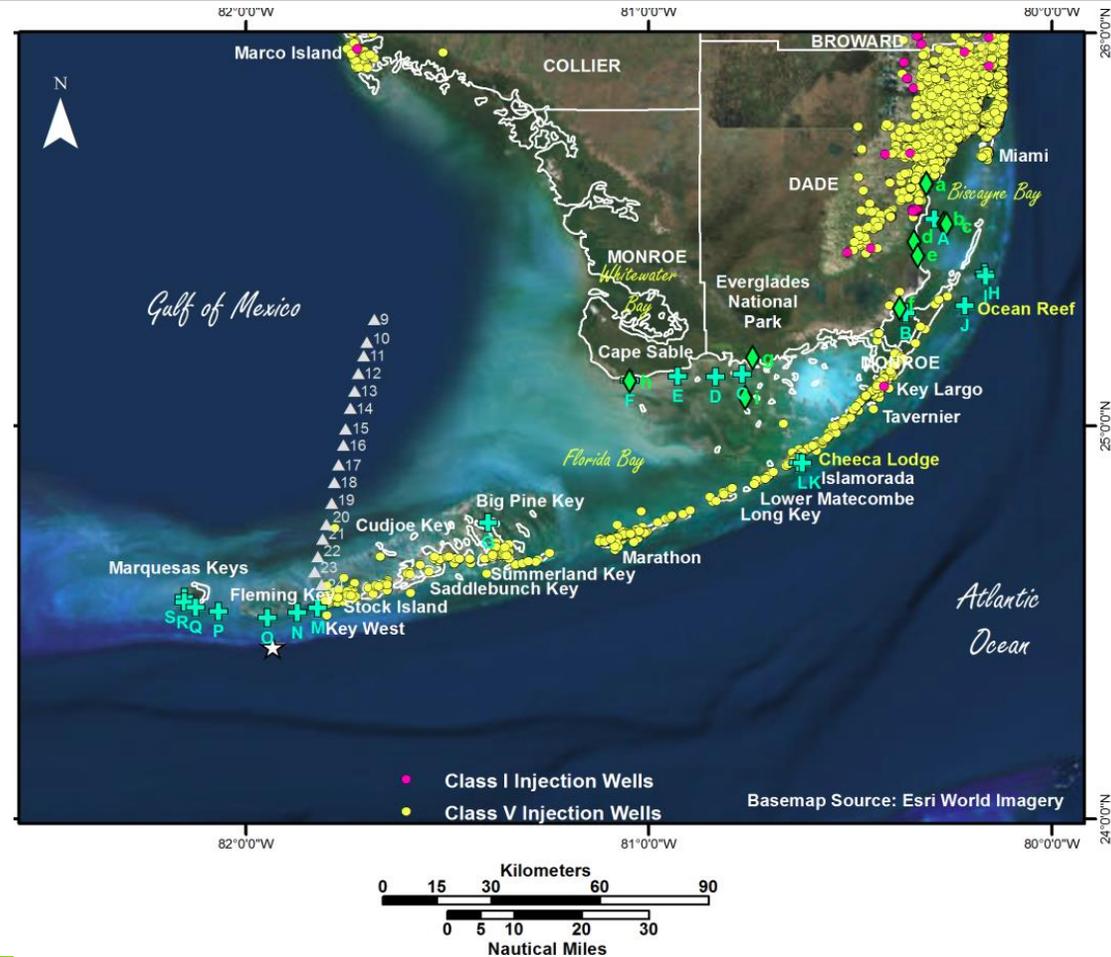


WASTEWATER IN THE KEYS: THE JOB CONTINUES



SANCTUARY WATERS: IMPAIRED

FDEP Reasonable Assurance Plans for the Florida Keys

Based on **Management Actions** contained in Chapter 99-395 Laws of Florida

1. Regional **Collection** Systems
2. **Treatment** to AWT Standards
3. Effluent **Disposal** that does not “cause or contribute to a violation of state water quality standards”

Management Actions: Disposal

The Law (F.S.403-085(10)(h))

If it is demonstrated that a discharge, *even if the discharge is otherwise in compliance with this subsection*, will cause or contribute to a violation of state water quality standards, the department shall:

- 1. Require more stringent effluent limitations;
- 2. Order the point or method of discharge changed;
- 3. Limit the duration or volume of the discharge; or
- 4. Prohibit the discharge.

Management Actions: Disposal

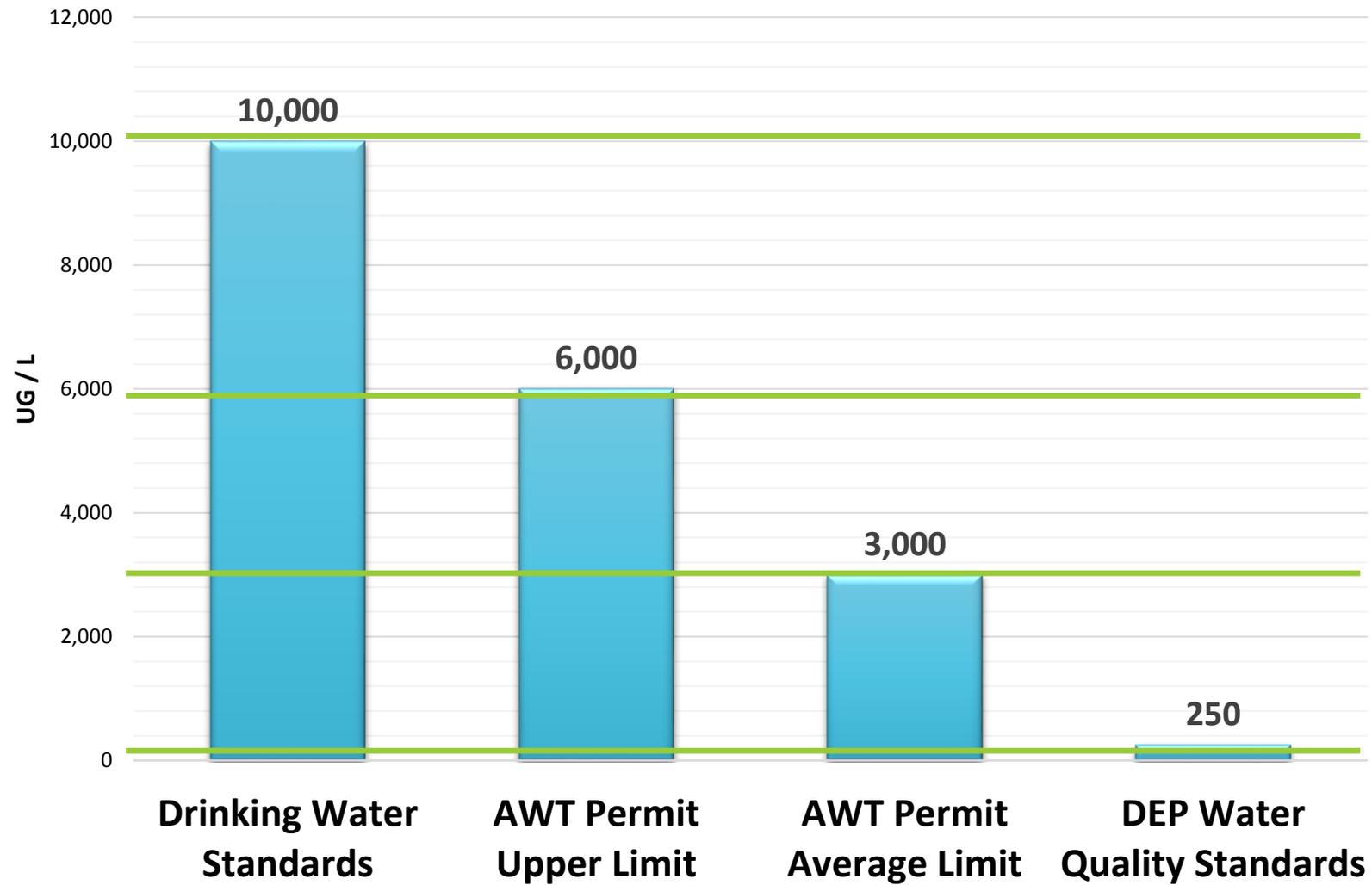
The Rule (62-528-630(7) F.A.C.) in Underground Injection Control

- **All Class V Group 3 wells designed *to inject wastewater in Monroe County shall* be required as part of the operation permit application to *provide reasonable assurance that operation of the well will not cause or contribute to a violation of surface waters standards* as defined in Chapter 62-302, F.A.C.**

It's AWT; Why Worry?

	AWT Standard	Water Quality Standard
Total Nitrogen	3.0 mg/L	0.21 mg/L or narrative
Total Phosphorous	1.0 mg/L	0.09 mg/L or narrative
Pharmaceuticals and Personal Care Products	Unlimited	None (Substances in concentrations which injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, plants or animals.)
Chlorine	0.5 mg/L MINIMUM	0.01 mg/L MAXIMUM

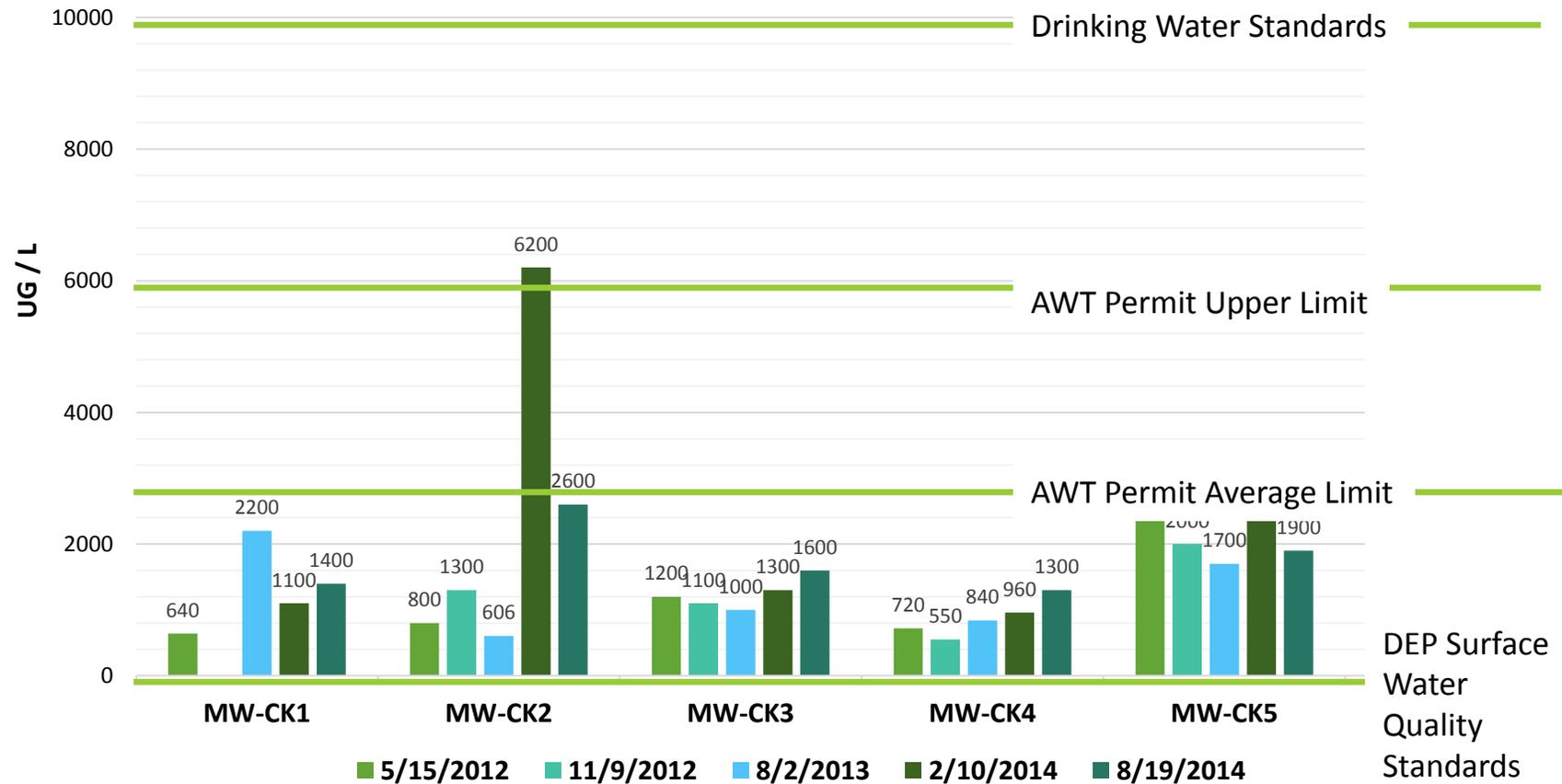
PUTTING AWT NITROGEN IN PERSPECTIVE



Nitrogen in Groundwater at Cudjoe Landfill

Highest Nitrogen Value is 25 times surface water standard

Average Nitrogen Value (1584) is 6 times surface water standard



Groundwater at Unlined Landfill Adjacent to Wastewater Treatment Plant compared to Drinking Water, AWT, and Surface Water Standards

Its AWT; Why Worry?

Pharmaceuticals in Coastal Waters (NOAA)

“Wastewater typically contains any number of medications and hormones that people have either used or discarded. Many of these chemical compounds remain biologically active. And some of them, ***especially hormones such as estrogen, appear to significantly alter aquatic organisms.***”

“***Antibiotic resistant bacteria***, which may be an indicator of long-term environmental exposure to antibiotics, ***were found in coastal waters and bottlenose dolphins.*** These and other studies will help describe the extent of pharmaceutical pollution in coastal waters.”

“Effluent ***used for irrigation on golf courses....***(R)esearch to determine if pharmaceuticals present in this wastewater persist long enough to ***reach coastal ecosystems.***”

http://www.noaa.gov/features/protecting_1208/pharmaceuticals.html

Effluent Disposal Needs Watching

- “Compliance with AWT standards provides the treatment necessary to provide reasonable assurance that operation of the wells will not cause or contribute to a violation of surface water standards as defined in Chapter 62-302, F.A.C.”

Florida Department of Environmental Protection
South District Office
February 3, 2015

Effluent Disposal Needs Watching

PERMITTING: No information obtained about surface water quality, preferential pathways or other hydraulic connections at the well.

ON-GOING: No local or “preferential pathway” surface water monitoring.

RESULT: Millions of gallons a day of nutrient-rich effluent continues to reach our surface waters.

Effluent Disposal Needs Watching

Recent Studies Regarding ‘Preferential Pathways’ and Injected Water

Benthic Macroalgal Blooms as Indicators of Nutrient Loading From Aquifer-Injected Sewage Effluent in...the South Florida Keys. Journal of Geography and Geology; Vol. 6, No. 4; 2014

“...Preferential Groundwater Flow ... Northeast Florida” Journal of Sustainable Development; Vol. 7, No. 4: 2014

“Preferential Groundwater Flow Pathways and Hydroperiod Alterations indicated by Georectived Lineaments and Sinkholes” ...Journal of Sustainable Development; Vol. 5, No. 12; 2012

**Contact: Marguerite Madden, Professor and Director. Center for Geospatial Research,
Department of Geography, University of Georgia, Athens, USA**

RAD for the Keys/Effluent Disposal

Let's Finish the Job

Monroe County voters approved 1 cent sales tax to “be used only for wastewater until ... the necessary wastewater projects...fully funded...”

“...there is \$180 million “unencumbered” for the next 20 years. Hence, if a deep well is needed, the money is available.” Roman Gastesi, Monroe County Administrator, August, 2014.

RAD for the Keys/Effluent Disposal Let's Finish the Job

Urge this Steering Committee to focus the WQPP on:

- Impact of AWT effluent on in-shore surface waters
- Impact of pharmaceuticals on aquatic life