Florida Ocean Outfall Legislation:
What it Means for Utilities and What They Are Doing to Comply

May 1, 2015

Monique Durand, PE

FIPA Spring Workshop

HAZEN AND SAWYER
Environmental Engineers & Scientists

PD-Sw210

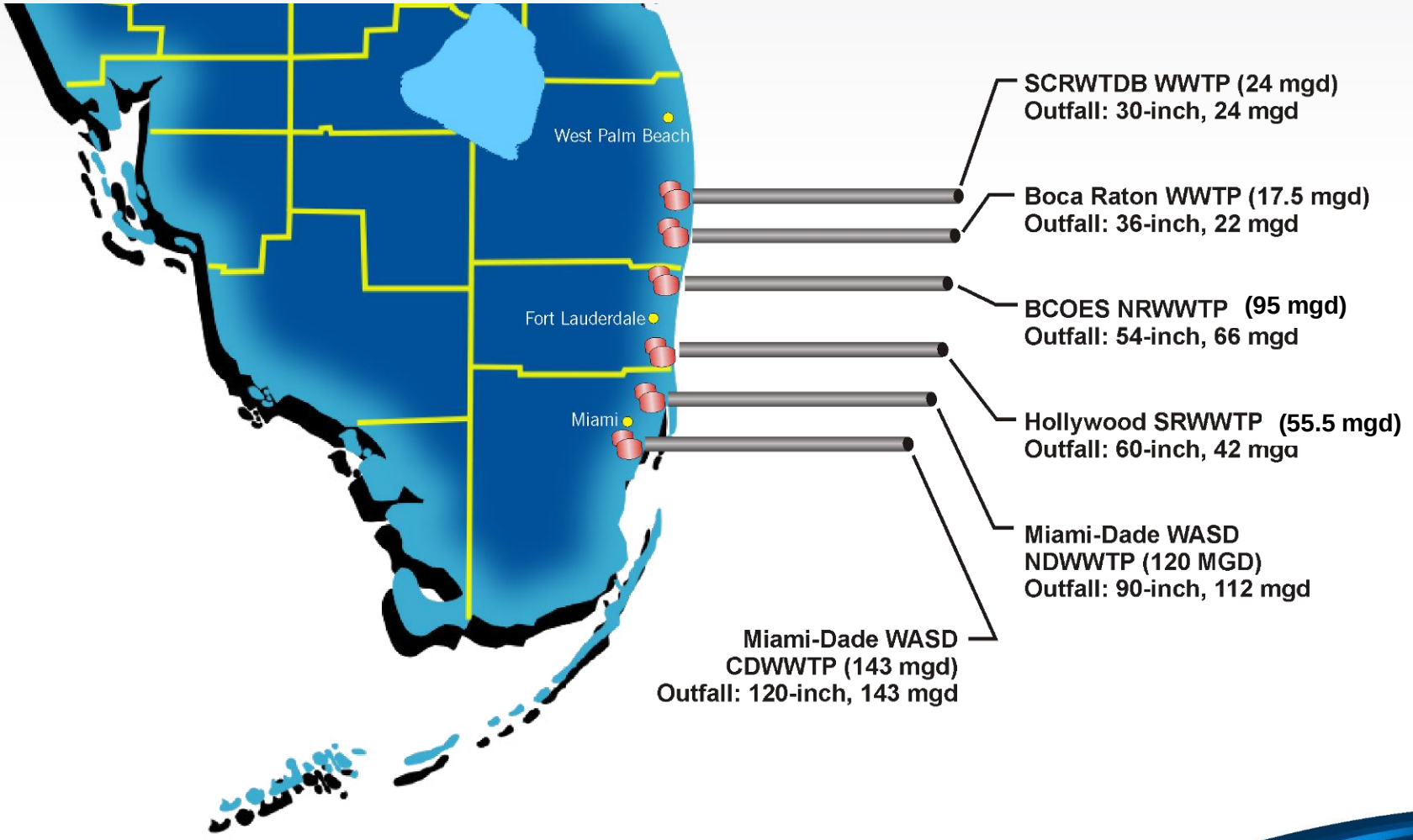
Outline

- Background
- Regulatory overview
- Implementation of compliance strategies for existing ocean outfalls:
  - Advanced wastewater treatment requirements
  - Reuse requirements
  - Eliminate discharge through outfall
- Future Considerations

What Are Open Ocean Outfalls?

- Discharge of treated wastewater (secondary effluent)
- Historically pretreatment programs limited by marine Surface Water Quality Standards

Location of Existing Ocean Outfalls in Florida



PD-Sw210

Regulatory Overview – Outfall Rule

- Florida Statutes Chapters 2008-232 and 2013-31
- Effective July 1, 2008
- Amended in 2013
- Discharges through ocean outfalls determined (by Legislature) to:
  - “Waste valuable water supplies that can be used for beneficial purposes to meet public and natural system demands”
  - “Compromise coastal environment, quality of life and local economies that depend on those resources”

Regulatory Overview – Outfall Rule

- Prohibits construction / expansion of ocean outfalls
- Mandated nutrient reduction
- Mandated reuse
- Prohibited outfall discharge after, 2025
- Included reporting requirements

Rule Implementation

- Existing outfalls capped at capacity as of July 1, 2008
- FDEP established baseline and target nutrient loadings for each utility discharging to an outfall
  - Monitoring data from 2003 to 2007
- FDEP established “baseline flow” for each utility discharging to an outfall
  - Monitoring data from 2003 to 2007 of flows through the outfall

Nutrient Reduction Alternatives

- **Option 1** – Provide AWT – **December 31, 2018**
- **Option 2** – Achieve reduction in outfall baseline TN and TP loadings equivalent to AWT requirements
- **Option 3** – Achieve reduction in cumulative TN and TP loadings from 2009 - 2025 equivalent to AWT levels between 2019 – 2025
- **Option 4** - Install fully operational 100% reuse system
  - Wet weather discharges through ocean outfall after 2018 or 2025 are not restricted in terms of nutrient concentration or load

Reuse Compliance

- Functional reuse system fully operational by December 31, 2025
- ≥ 60% of baseline outfall flow converted to reuse
- Environmentally, economically, and technically feasible
- Irrigation of public access areas, residential properties or agricultural crops; aquifer recharge; groundwater recharge; industrial cooling
- Applies to all utilities discharging to an outfall regardless of outfall ownership
- Allows virtual reuse agreement between utilities - transfer of reuse credit
- Challenges associated with meeting the reuse requirements in largely built out municipalities

Effluent Disposal Compliance

- Outfall discharge prohibited after December 31, 2025 except as backup discharge for functioning reuse system
- Wet weather periods of reduced reclaimed water demand
- Required to meet AWT standards

Reporting Requirements

- Compliance Status Report
  - 2009, 2014, 2019 and 2024
- Detailed Compliance Plan Report
  - 2013 and 2016


Miami-Dade Water and Sewer Department

Ocean Outfall Legislation

Chapter 2008-232 Laws of Florida Wastewater Disposal/Ocean Outfalls
[Section 403.086 (9), Florida Statutes and Amendment CS/SB 444]

Compliance Plan

June 28, 2013

Miami-Dade
Water and Sewer Department
P.O. Box 33-0316, Miami, FL 33233-0316

South Central Regional Wastewater Treatment and Disposal Board (SCRWTDB)

- Meeting AWT requirements through reduction in outfall baseline TN and TP loadings – **Option 2**
  - Currently achieving AWT reductions
- 60 percent reuse goal = 7.7 mgd
  - Delray Beach = 3.923 mgd
  - Boynton Beach = 4.949 mgd
  - Combined 1.869 mgd provided between 2007 and 2013
  - Costs ~ $20.06 million to construct new reuse distribution facilities
- Meeting all report requirements

South Central Regional Wastewater Treatment and Disposal Board (SCRWTDB)

- Completely eliminated discharge through outfall
  - Limited use of Boynton/Delray ocean outfall since 2009
  - Deep injection wells installed to handle entire plant flow
  - Irrigation reuse

City of Boca Raton

- Meeting AWT requirements
- Installed 100% 17.5 mgd reuse system – **Option 4**
- Exceeds total amount of reuse required – 11.8 mgd
- Between 2006 and 2013 spent $12.4 million to expand reuse system
- Outfall is backup to 100% reuse system during periods of low demand
- Meeting all reporting requirements

Glade's Road Utility Services Complex

PD-Sw210

Broward County Water and Wastewater Services

- Meeting AWT requirements through reduction in cumulative TN and TP outfall loadings – **Option 3**
- 60 percent reuse goal = 22.4 mgd
  - Pompano Beach; Large Users in Broward County; Large Users in Palm Beach County
  - Ongoing negotiations with Palm Beach County for 15 mgd reuse flow
  - Broward County costs = $77 million
  - Palm Beach County costs = $40 million

PD-Sw210

Broward County Water and Wastewater Services

- Plans to completely eliminate discharge through ocean outfall:
  - Divert all flow to deep injection wells
  - Handle entire NRWWTP flow, expect for peak discharge
  - Six deep injection wells installed
  - Two additional injection wells under construction
  - Booster pumps for all eight injection wells under construction
  - Estimated construction costs = $30 million
- Meeting all reporting requirements

City of Hollywood

- Meeting AWT requirements through reduction in cumulative TN and TP outfall loadings – **Option 3**
  - Maximize use of existing deep injection wells
  - Plan incorporated into daily operating strategy – January 1, 2009
  - On track with meeting AWT requirements

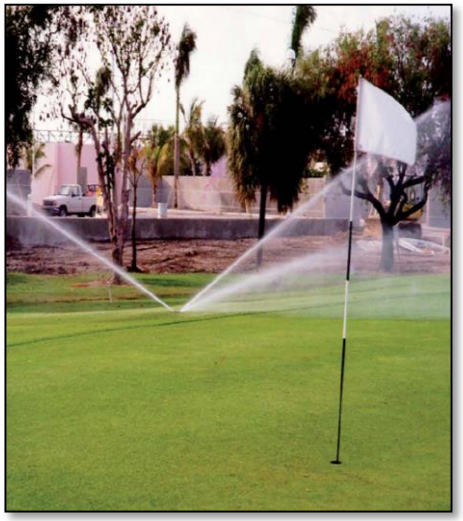
City of Hollywood

- 60 percent reuse goal = 20.4 mgd
- Alternatives evaluated
  - Environmental impacts
  - Economically infeasible

Alternative	Construction Cost
Floridan Aquifer recharge through direct injection	$182 - $282 million
Biscayne Aquifer recharge through canal discharge	$676 - $833 million
Biscayne Aquifer recharge through direct injection	$715 - $872
Public access reclaimed water system expansion	$933 million

City of Hollywood

- Revised multi-pronged strategy to meet 60 percent reuse requirement
  - Maximize existing 4 mgd SRWWTP reclaimed water treatment capacity
  - Virtual reuse
  - Reuse credit through conservation
  - Reuse credit for City's Floridan Aquifer supply and RO treatment
  - Reallocation of reuse capacity to backup disposal classification
  - Exclude brackish groundwater from baseline flow calculation



City of Hollywood

- Plan to eliminate discharge through ocean outfall:
  - Diverting all flow to deep injection wells
  - Expand deep injection well capacity to handle existing plant capacity of 55.5 mgd
  - Estimated ocean outfall closure costs totaling $93.4 million
- Meeting all reporting requirements

PD-Sw210

City of Cooper City

- Meeting AWT requirements through reduction in outfall baseline TN and TP loadings – **Option 2**
- Commencing 2009 effluent disposed through City's deep injection well
  - 1.7 mgd to supply Hollywood reuse program
- Minimal nutrient loadings to Hollywood ocean outfall

Deep Injection Well

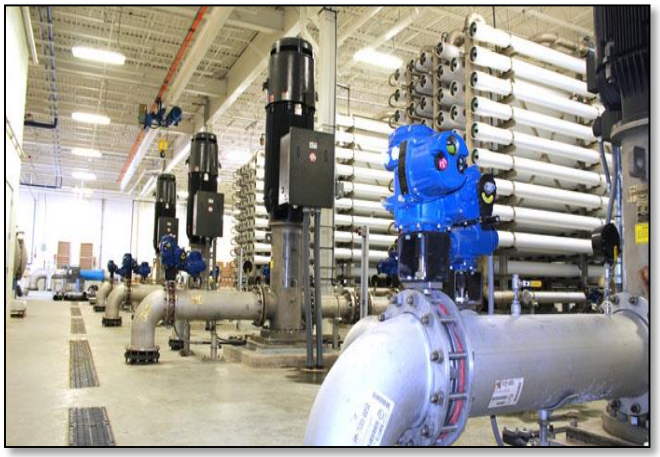
PD-Sw210

City of Cooper City

- 60 percent reuse goal = 0.9 mgd
  - Continue to supply City of Hollywood reuse system
  - For additional reuse credit nine alternatives evaluated
  - Partnering with City of Sunrise for 1 mgd reuse credit top ranked alternative
  - Ongoing discussions with other utilities

Town of Davie

- Meeting AWT requirements through reduction in cumulative TN and TP outfall loadings – **Option 3**
- Divert flows to newly constructed 3.5 mgd Water Reclamation Facility
  - Two deep injection wells



Water Reclamation Facility (AECOM)

PD-Sw210

Town of Davie

- 60 percent reuse goal = 1.1 mgd
  - New 2.0 mgd public access reuse system
- Alternatives under review to completely eliminate discharge through Hollywood's ocean outfall
  - Continue to supplement Hollywood reuse program
  - Construct new deep injection well at existing wastewater treatment facility
  - Evaluate reuse feasibility at existing Wastewater Treatment Facility

MIAMI-DADE COUNTY WATER AND SEWER DEPARTMENT

IT STARTS WITH WATER
WWW.MIAMIDADE.GOV/WATER

MIAMI-DADE COUNTY

Ocean Outfall Legislation Compliance Plan Projects

	Description	Project Cost
CE-1	CDWWTP - INJECTION WELL PUMP STATION	$ 75,323,067
CE-2	CDWWTP - DEEP INJECTION WELLS	$ 157,132,202
CE-3	CDWWTP - CENTRATE DISPOSAL PUMP STATION	$ 20,000,000
CE-4	CDWWTP - CENTRATE DISPOSAL WELL	$ [illegible]
CL-3	48-INCH FM CONNECTION IN NW 58 ST FROM NW 107 AVE TO 87 AVE - DORAL	$ [illegible]
CL-4	EAST/WEST 72/84-INCH FM CONNECTION FROM PS 187 TO WDWWTP	$ 157,380,000
CL-5	72-INCH FM CONNECTION IN SW 137 AVE TO CL-4 FM IN NW 6TH ST	$ 30,700,000
CL-7	48-INCH FM CONNECTION IN NW 58 ST FROM PS 14 TO NW 72 AVE - DORAL	$ 18,[illegible]
CL-9	54-INCH FORCE MAIN FROM WP-1 (DORAL) TO WDWWTP	$ [illegible]
CL-X	FLOW CONTROL - PIPELINE INTERCONNECTIONS	$ 5,000,000

	Description	Project Cost
CP-187E	UPGRADE TO PS 187	$ [illegible]
CR-1	CDWWTP - FLORIDAN AQUIFER RECHARGE	$ 26,666,050
CT-2	CDWWTP - HLD TREATMENT	$ 173,[illegible],409
CT-3	CDWWTP - PEAK FLOW TREATMENT	$ [illegible]
NE-1	NDWWTP - INJECTION WELL PUMP STATION	$ [illegible]
NE-2	NDWWTP - DEEP INJECTION WELLS	$ 90,85[illegible],223
NT-2	NDWWTP - HLD TREATMENT	$ 63,940,607
NT-3	NDWWTP - PEAK FLOW TREATMENT	$ [illegible]
SE-1	SDWWTP - INJECTION WELL PUMP STATION	$ [illegible]
SE-2	SDWWTP - DEEP INJECTION WELLS	$ 6,670,215

	Description	Project Cost
SR-1	SDWWTP - FLORIDAN AQUIFER RECHARGE	$ [illegible]
SR-2	SDWWTP - FPL RECLAIMED WATER PIPELINE	$ 25,000,000
WE-1	WDWWTP - INJECTION WELL PUMP STATION	$ 119,312,512
WE-2	WDWWTP - DEEP INJECTION WELLS	$ [illegible]
WP-1	DORAL BOOSTER STATION	$ 50,000,000
WR-1	WDWWTP - FLORIDAN AQUIFER RECHARGE	$ 25,558,050
WT-1	WDWWTP - TREATMENT PLANT	$ 1,[illegible]
WT-2	WDWWTP - PEAK FLOW TREATMENT	$ [illegible]

Total $3,322,986,406

PD-Sw210

MDWASD

- Meeting AWT requirements through reduction in cumulative TN and TP outfall loadings – **Option 3**
  - Maximize existing deep injection well at North District plant
  - Construct new pumping station and deep injection well system at Central District plant
    - Disposal of sludge dewatering centrifuge concentrate

MDWASD

- 60 percent reuse goal =117.5 mgd
  - Construct pipeline from South District plant to supply 90 mgd reclaimed water to FPL Turkey Point facility
    - Estimated cost $95 million
  - Existing treatment plant upgrades
  - Construct 9.2 mgd injection well systems at Central District, South District and West District to recharge Floridan Aquifer
    - Estimated cost $77 million

PD-Sw210

MDWASD – North and Central District

- Plan to eliminate discharge through ocean outfall through combined reuse and deep injection well disposal systems:
  - Construct new West District plant with new deep injection wells and aquifer recharge reuse system
  - Construct new injection wells at North District plant
  - Construct new deep injection well system and aquifer recharge system at Central District pland
  - Increase treatment capacity of existing South District plant; new deep injection well system and aquifer recharge system
- Estimated costs for ocean outfall compliance = 3.32 billion

Future Considerations

- FDEP and SFWMD to continue working with City of Hollywood and Miami-Dade County
  - Challenges with meeting 60 percent reuse requirement
  - Technically feasible options to be identified before December 31, 2015.
- Potential to review and adjust pretreatment program local limits for pollutants limited by Surface Water Quality standards

Monique Durand, PE

Senior Principal Engineer

Hazen and Sawyer, Hollywood Office

(954) 987-0066

mdurand@hazenandsawyer.com