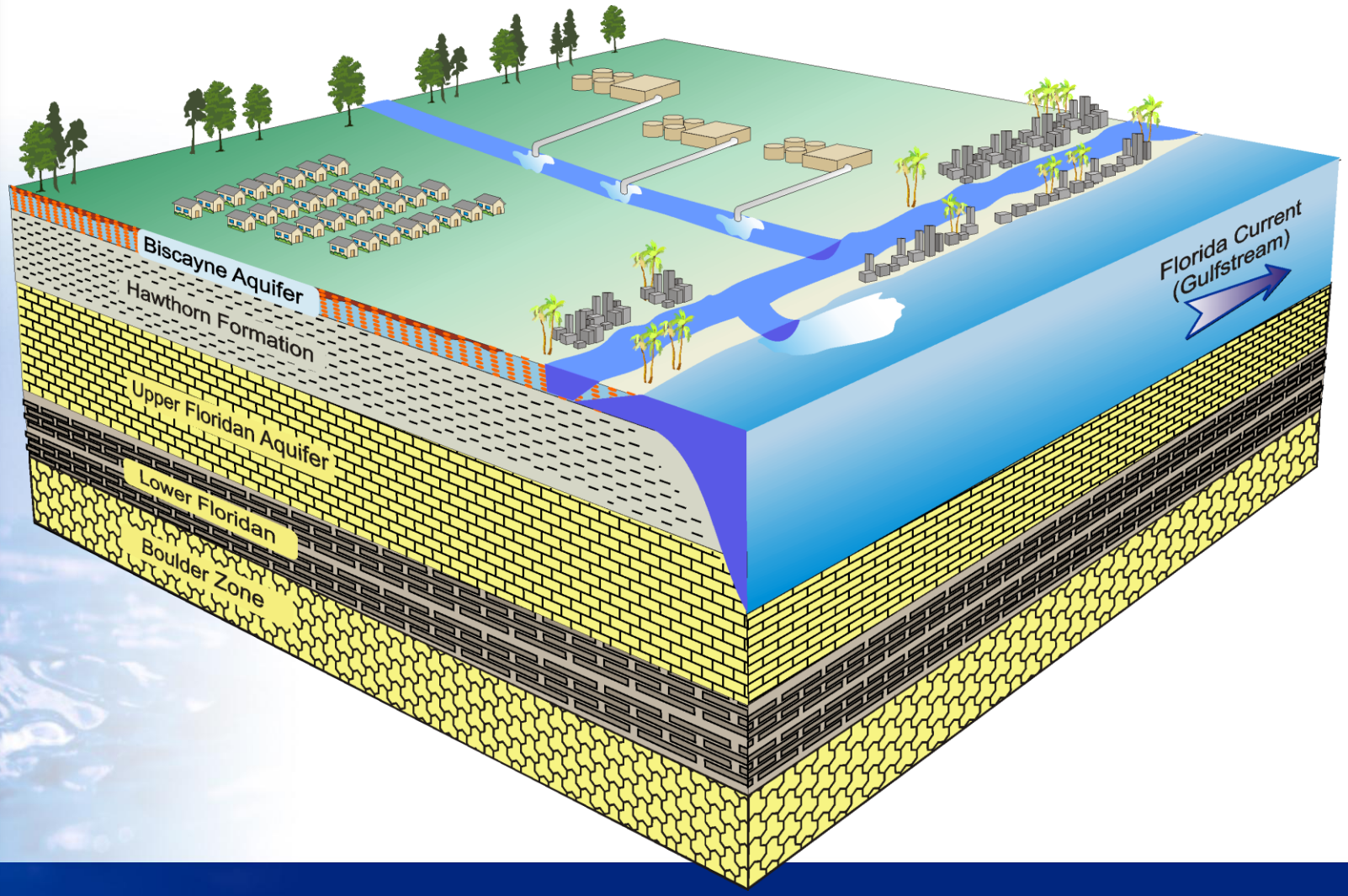
Water Resource Task Force Meeting

Broward County Effluent Disposal and Reclaimed Water Conceptual Master Plan

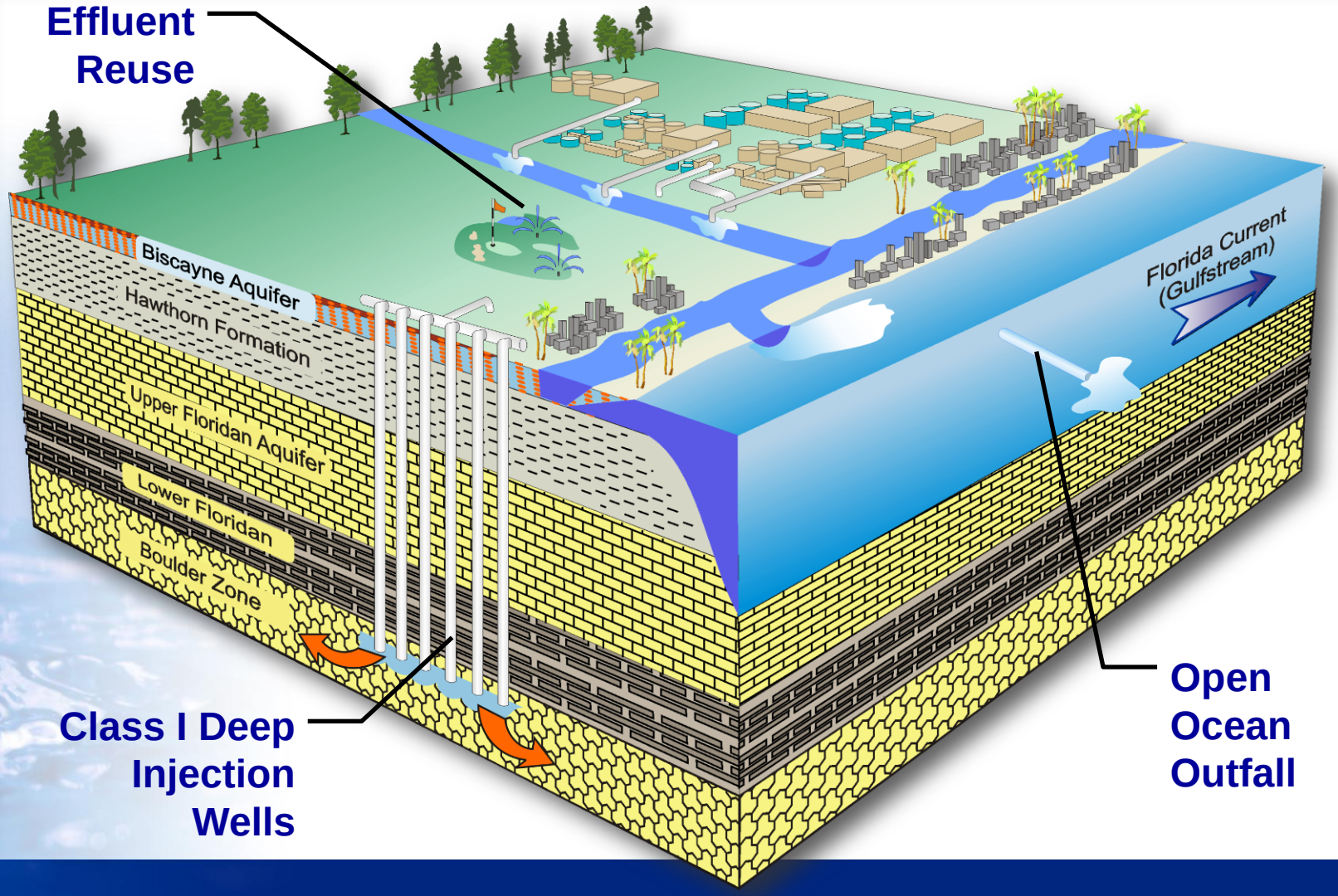
January 28, 2011

44228-703-07

Hydrology and environmental protection have driven effluent management decisions



Efforts subsequently proved to be an environmental success



The regulatory world changed: SB 1302 "Outfall Rule"

- Became Law on July 1, 2008
- 3 key requirements

1 Reduce outfall nutrient load

- Reduce nitrogen and phosphorus between now and 2025
- Implementation flexibility allowed by rule

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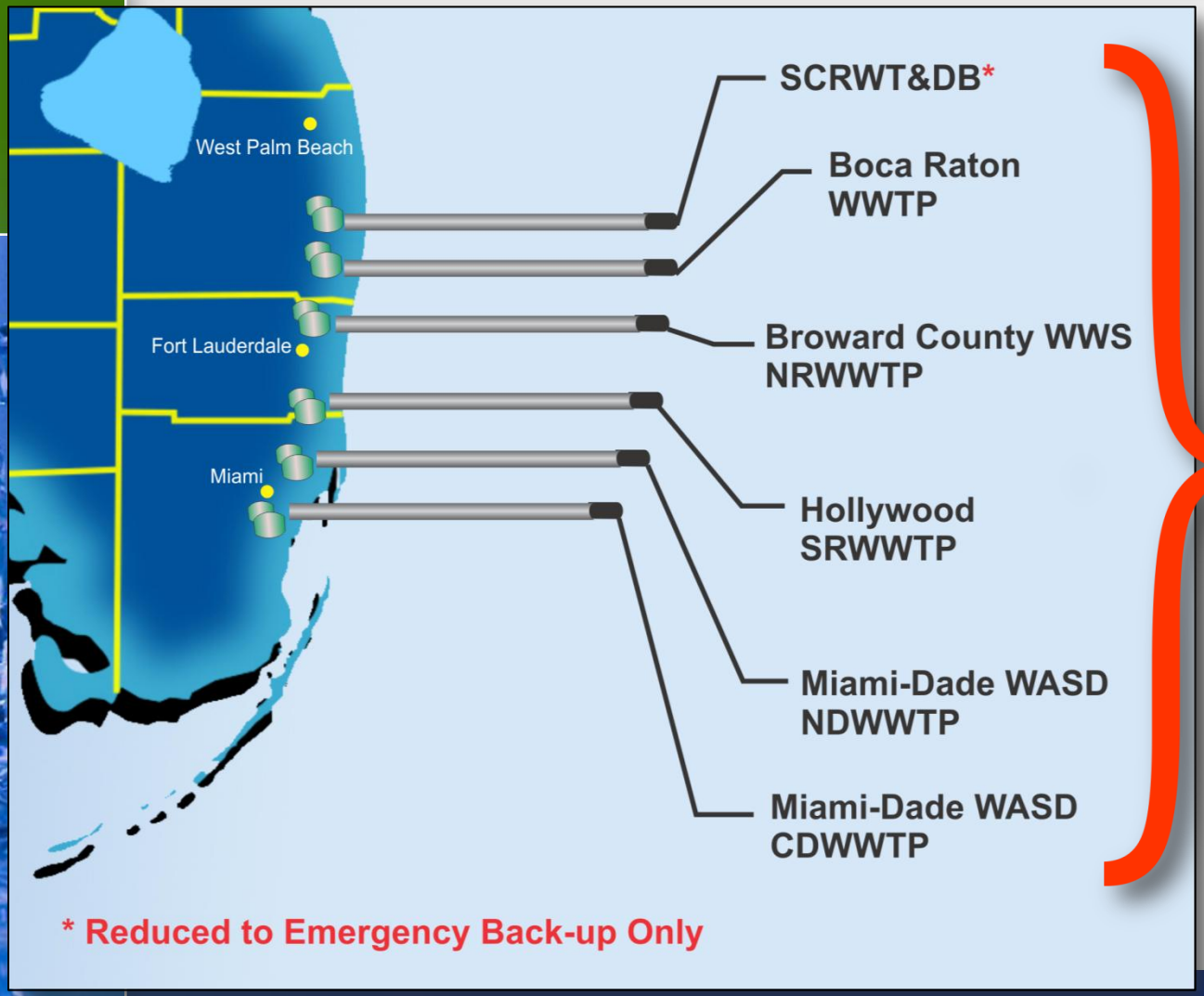
2 Expand wastewater reuse

- 60% of outfall flow (2003 - 2007) = 22.5 mgd

3 Close outfall

- December 31, 2025
- May still be used as back-up to functioning reuse system after 2025

This rule affects much of Southeast Florida



Effluent from over 3 million South Florida customers is managed via outfalls

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Current effluent disposal & reuse practices will be affected by the Rule

On Site Reuse
3.7 mgd
(10 mgd installed capacity)

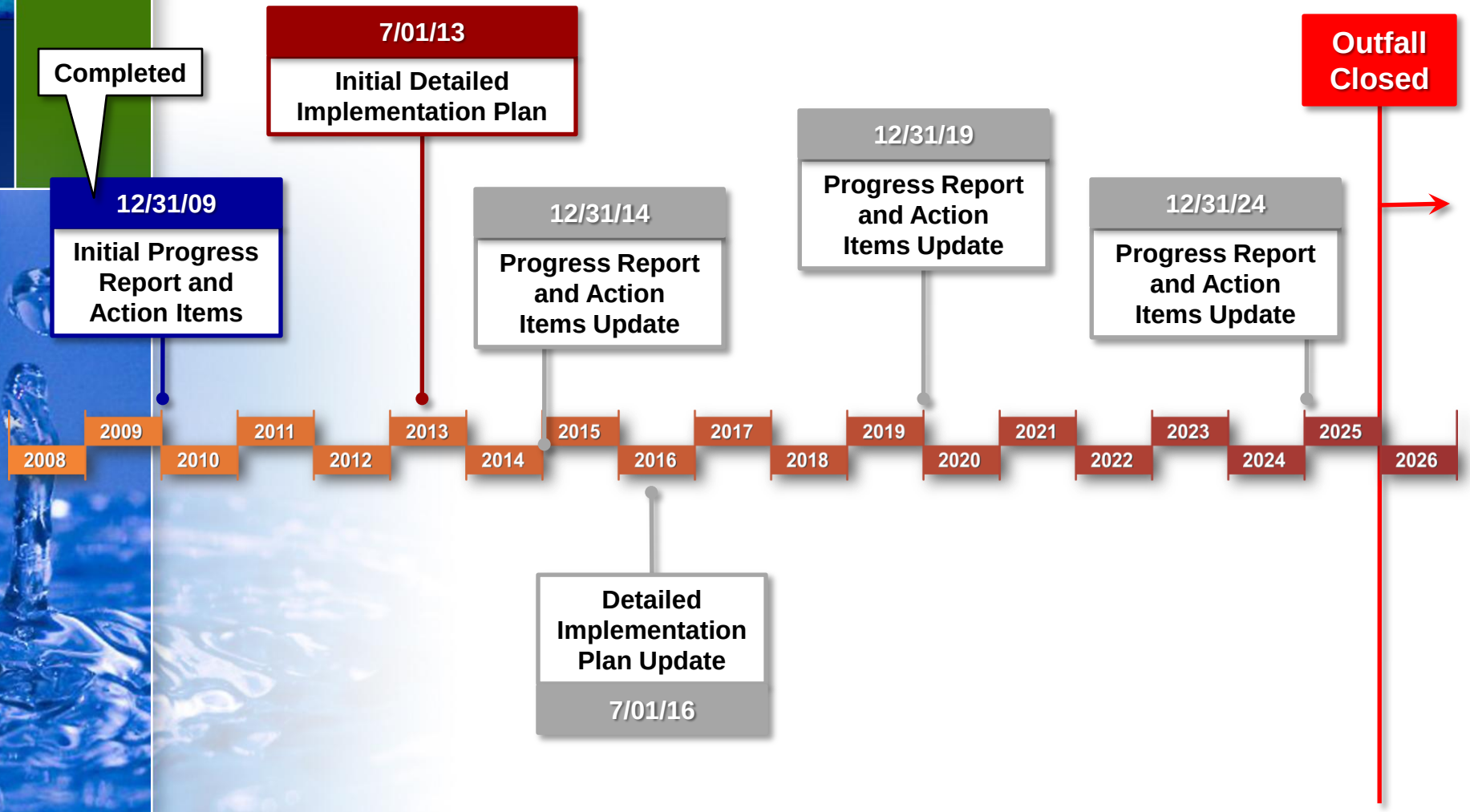
Off Site Reuse
1.1 mgd

Pompano Reuse
1.65 mgd

Class I Deep Injection Wells

Open Ocean Outfall

What is the reporting timetable?



Outfall rule planning must sync with on-going regional wastewater management planning

Interim Planning

Interim planning focuses on ….

- **Reduction of outfall nutrient loads**
- Maintaining peak effluent disposal capacity

Nutrients are allowed through 2025 – but capped

Broward NRWWTP Maximum Allowable Cumulative Nutrient Loading – Years 2009 through 2025		
Description	**Total Nitrogen**	**Total Phosphorus**
Cumulative Load: 2009 - 2018	12,824	1,002
Cumulative Load 2019 - 2025	1,196	398
Total Cumulative Load 2009 - 2025	**14,020**	**1,400**

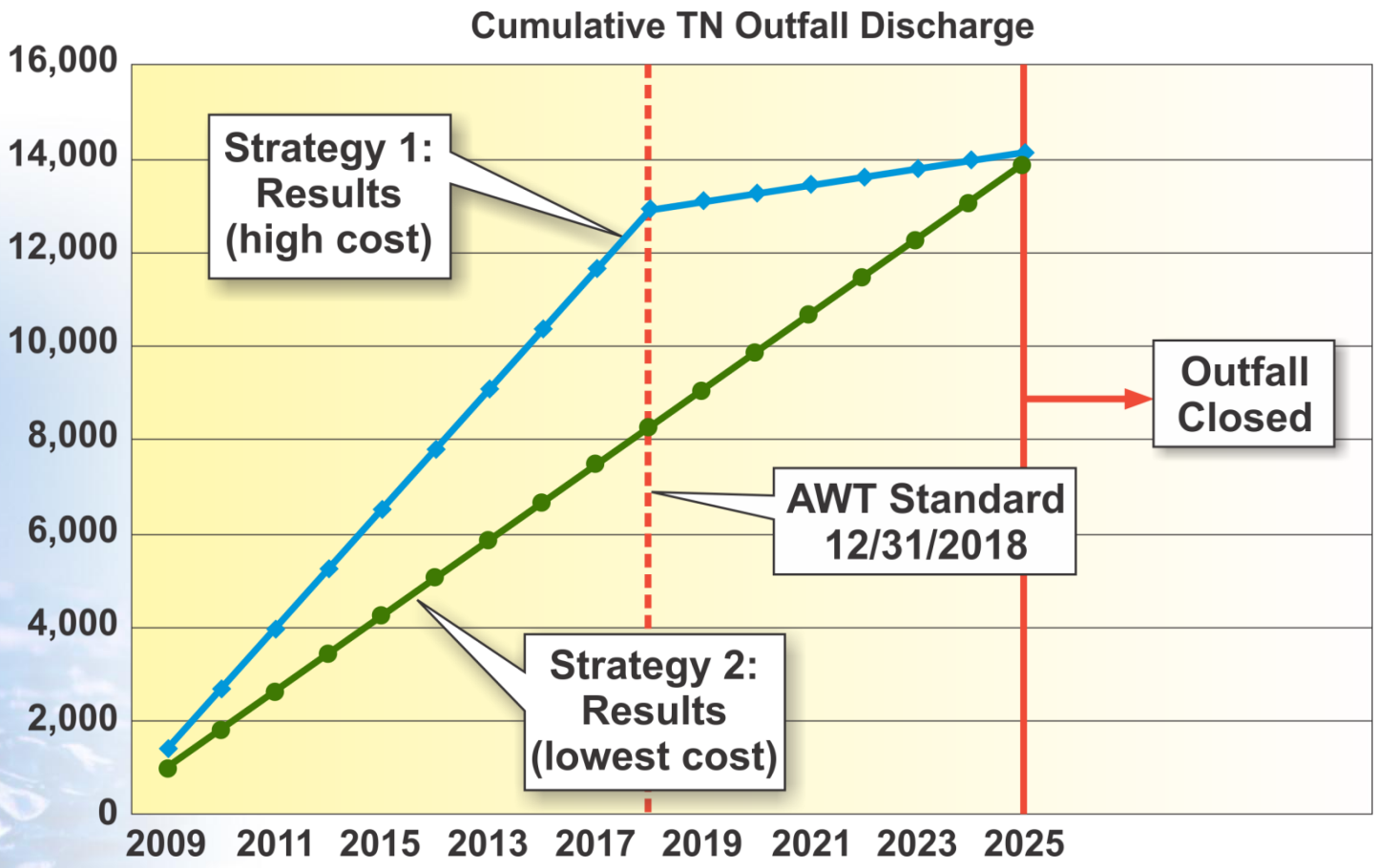
The rule gives us three potential nutrient reduction strategies:

- **Strategy 1 –** Continue current treatment process. Build AWT plant in 2018.
- **Strategy 2 –** Shift flow to deep wells. Build partial nutrient removal soon.
- **Strategy 3 –** Continue current treatment process. Build 100% reuse system by 2018.

Strategy 2 is the preferred approach

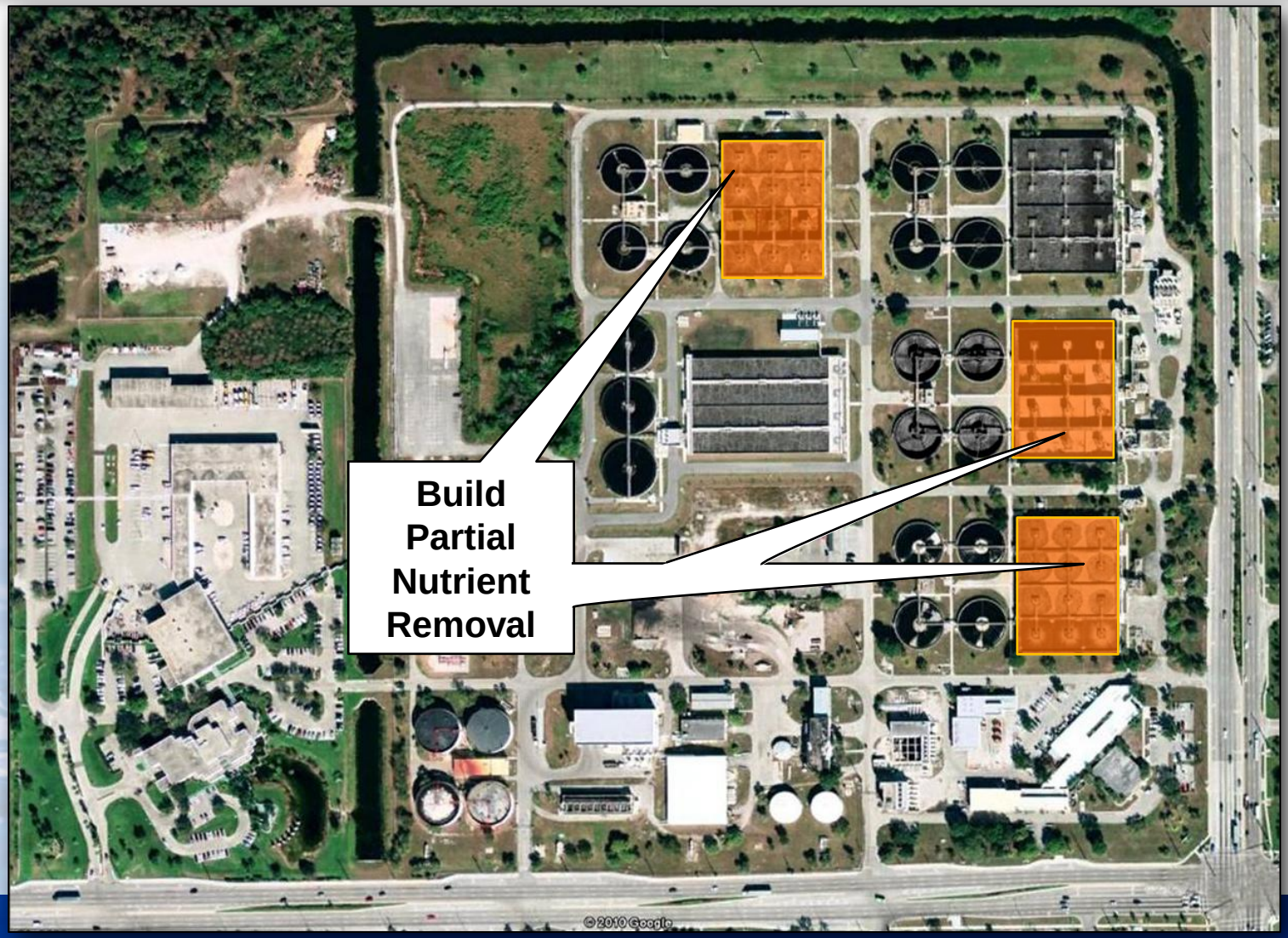
- **Strategy 2 –** Shift flow to deep wells. Build partial nutrient removal soon.

Nutrient reduction strategy comparison



* Phosphorus strategy is similar

Interim Project – Reducing nutrient loads



Ancillary benefit: replace obsolete equipment with energy efficient devices

Existing Mechanical Aeration

New Fine Bubble Aeration

Added benefit: Reduces greenhouse gas emissions

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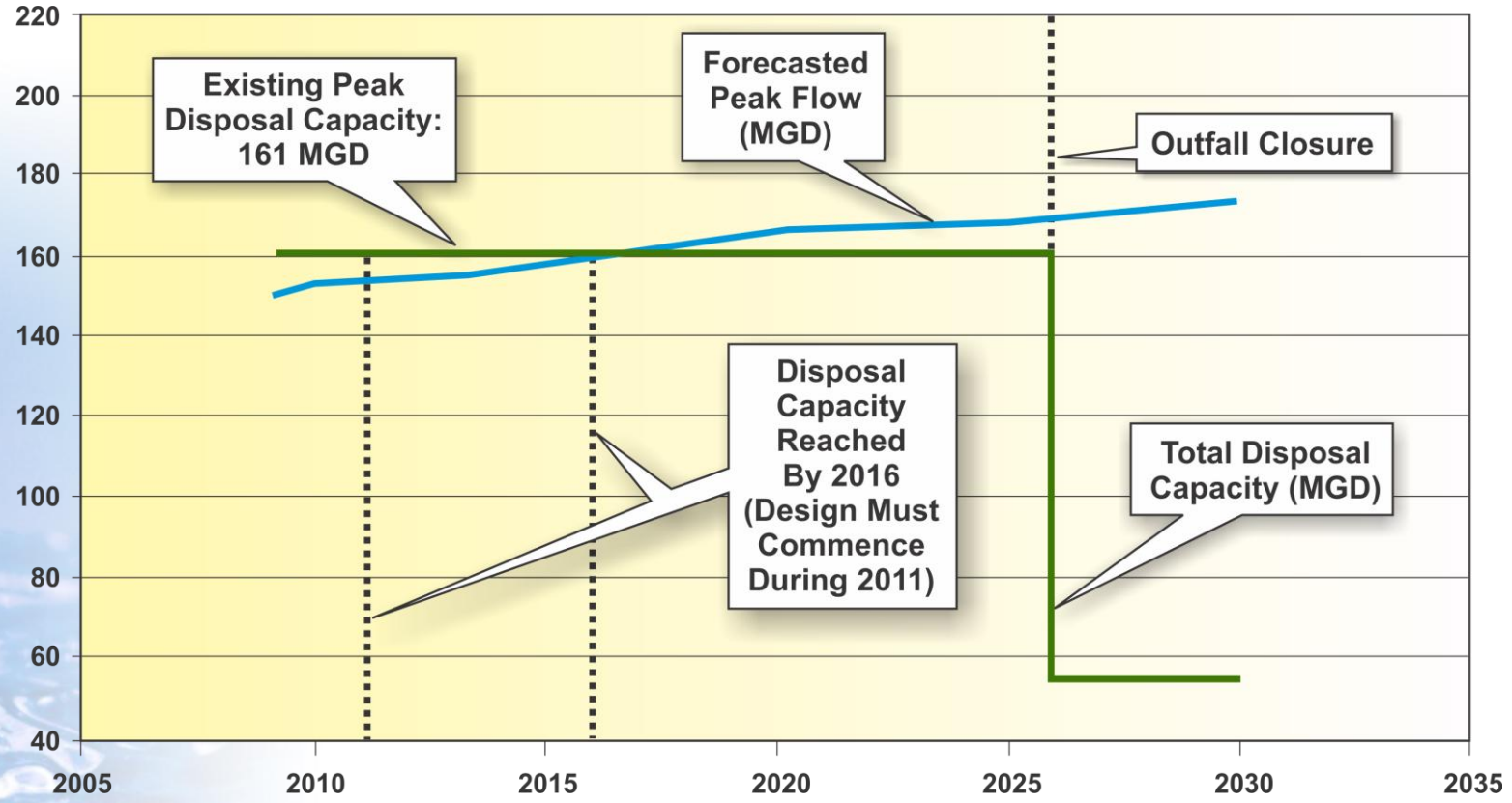
Interim planning focuses on ….

- Reduction of outfall nutrient loads
- **Maintaining peak effluent disposal capacity**

Current projections indicate that existing peak disposal capacity may be reached by 2016



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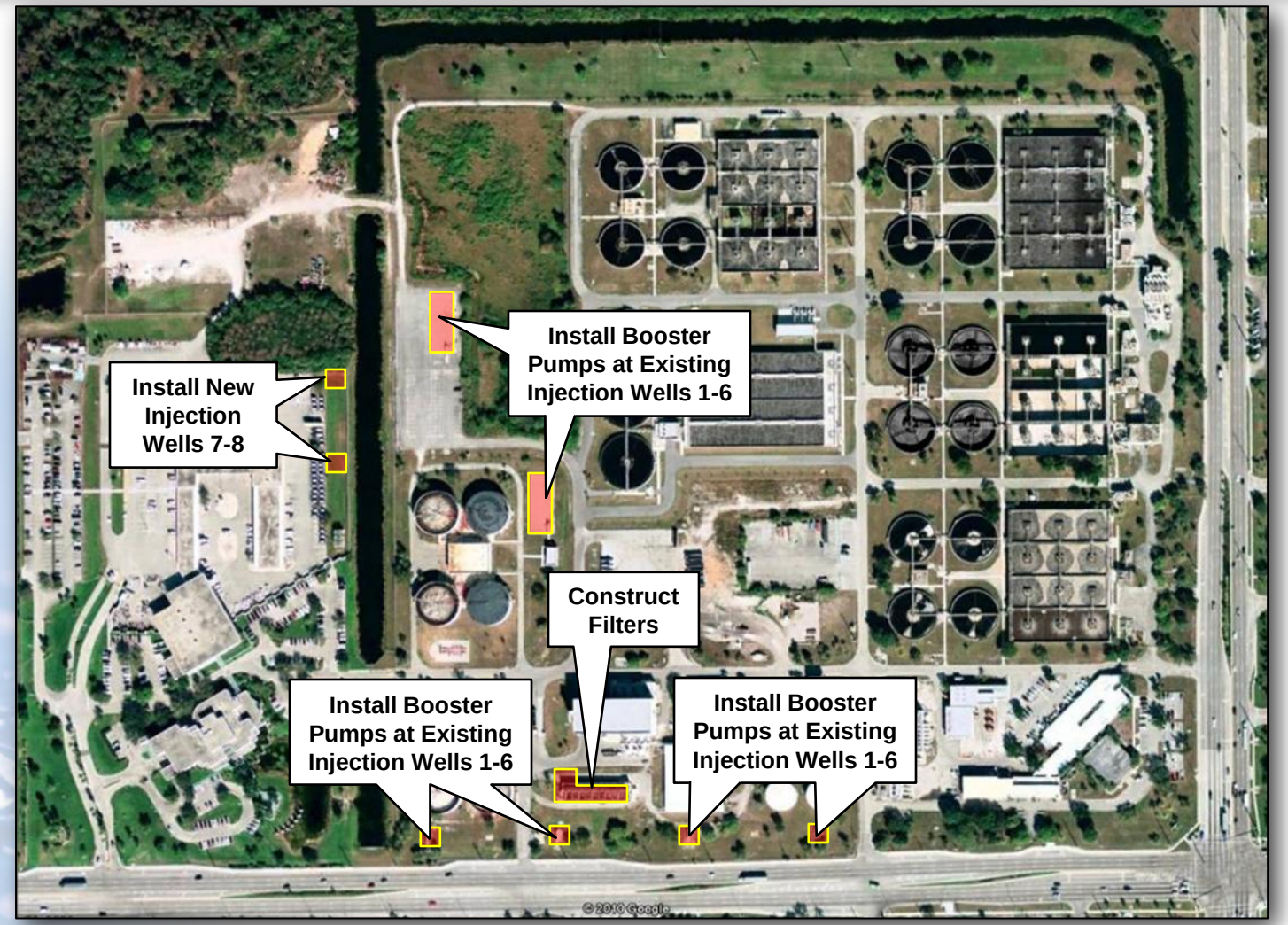
Interim Project – Maintain effluent disposal capacity



Summary of Interim Improvement Project Costs

Capital Improvement Program (CIP) Estimated Construction Cost	
Description	
Interim Improvements	
Partial Nutrient Removal	Planned under Energy Savings Program
Booster Pumps at Existing Injection Wells	$14 million
Two Injection Wells and Interim HLD Facilities	$44 million
Total Capital Requirements - Interim	**$58 million**

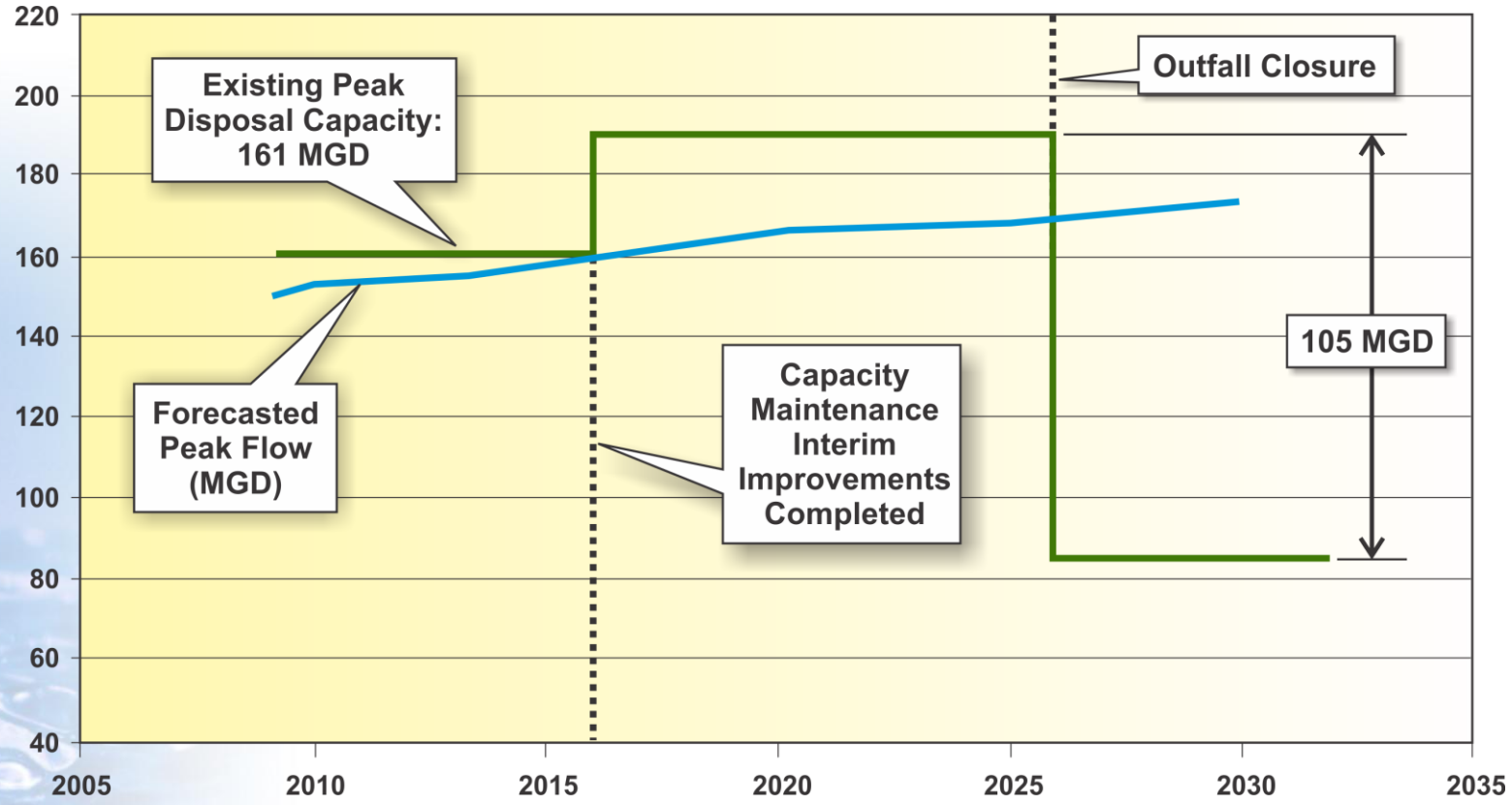
Gives us: 1) disposal capacity
2) ability to reduce nutrients to ocean

Long Term Planning

Long term planning focuses on ….

- **Replacement of outfall disposal capacity lost following closure**
- Best way to achieve reuse mandate

Outfall closure will create a gap in peak flow disposal capacity



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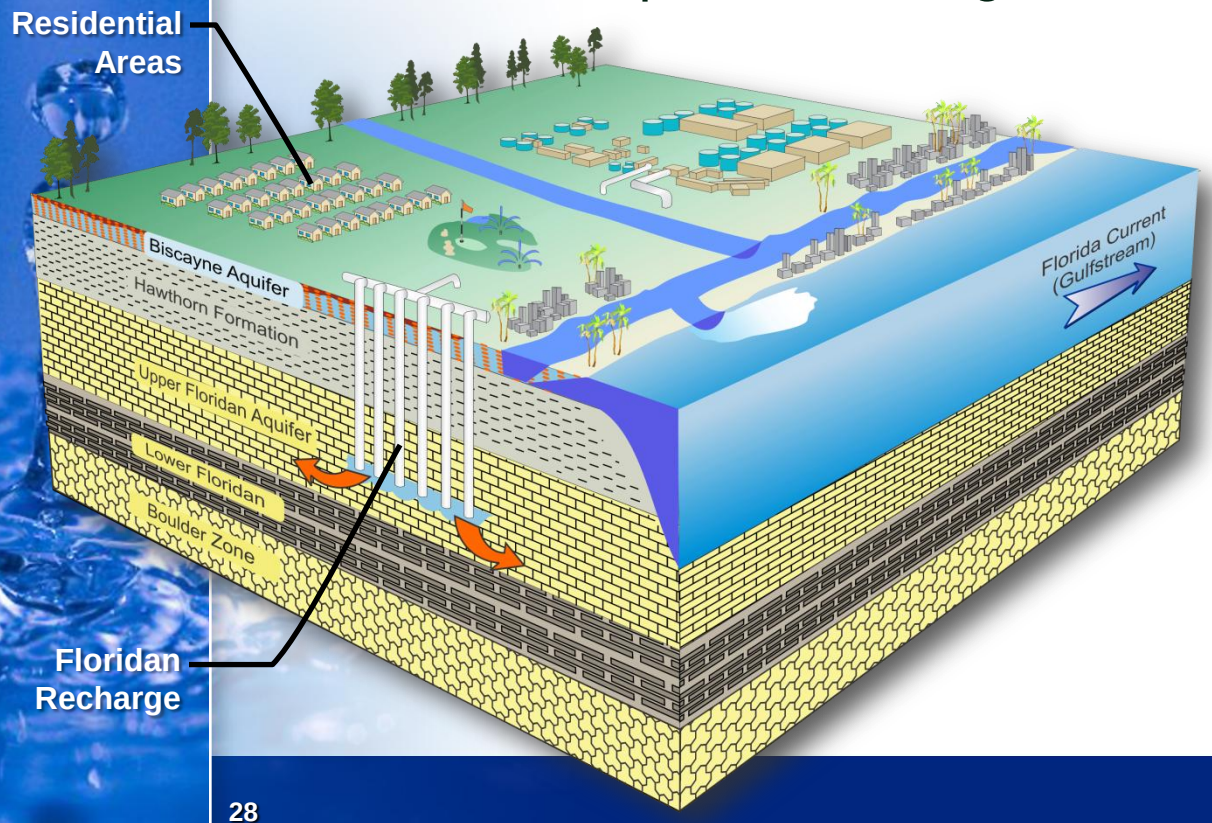
Long term planning focuses on ….

- Replacement of outfall disposal capacity lost following closure
- **Best way to achieve reuse mandate**

Where can we reuse an additional 22.5 mgd?

Options:

- Biscayne Aquifer Recharge
- Floridan Aquifer Recharge



- Irrigation & process water uses:
  - Large areas (parks, golf courses, etc.)
  - Residential
  - Industrial
  - Cooling towers

Two workshops with key regulatory decision makers & staff considered:

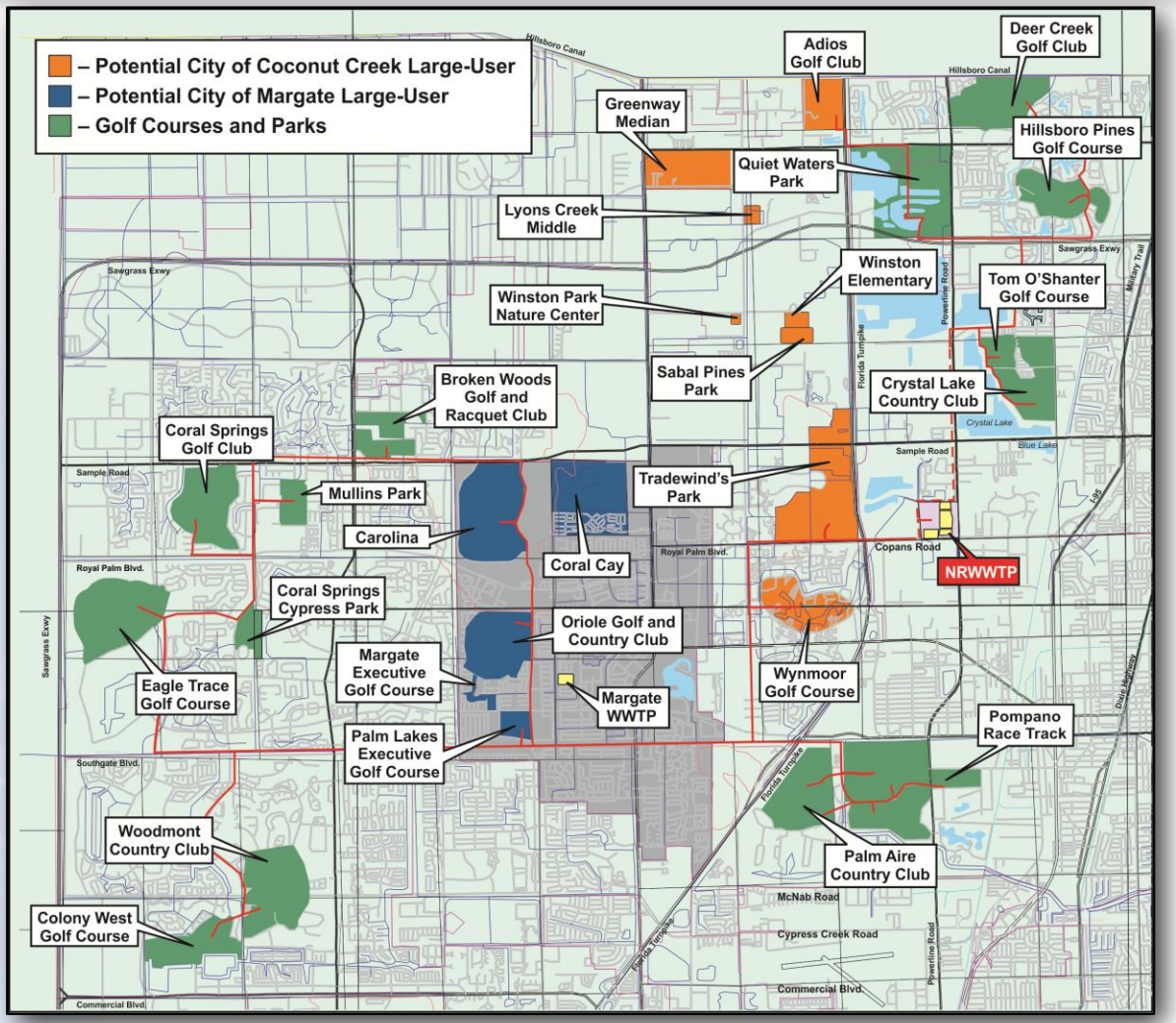
- **Qualitative rating values**
  - Permittability
  - Technical / Operational Feasibility - Complexity
  - Disposal Reliability
  - Public Acceptance
  - Available Funding Assistance
  - Greenhouse Gas Emissions
  - Adaptability to Regulatory Change
  - Constructability
- Cost rating values

Workshop Results – Functional analysis

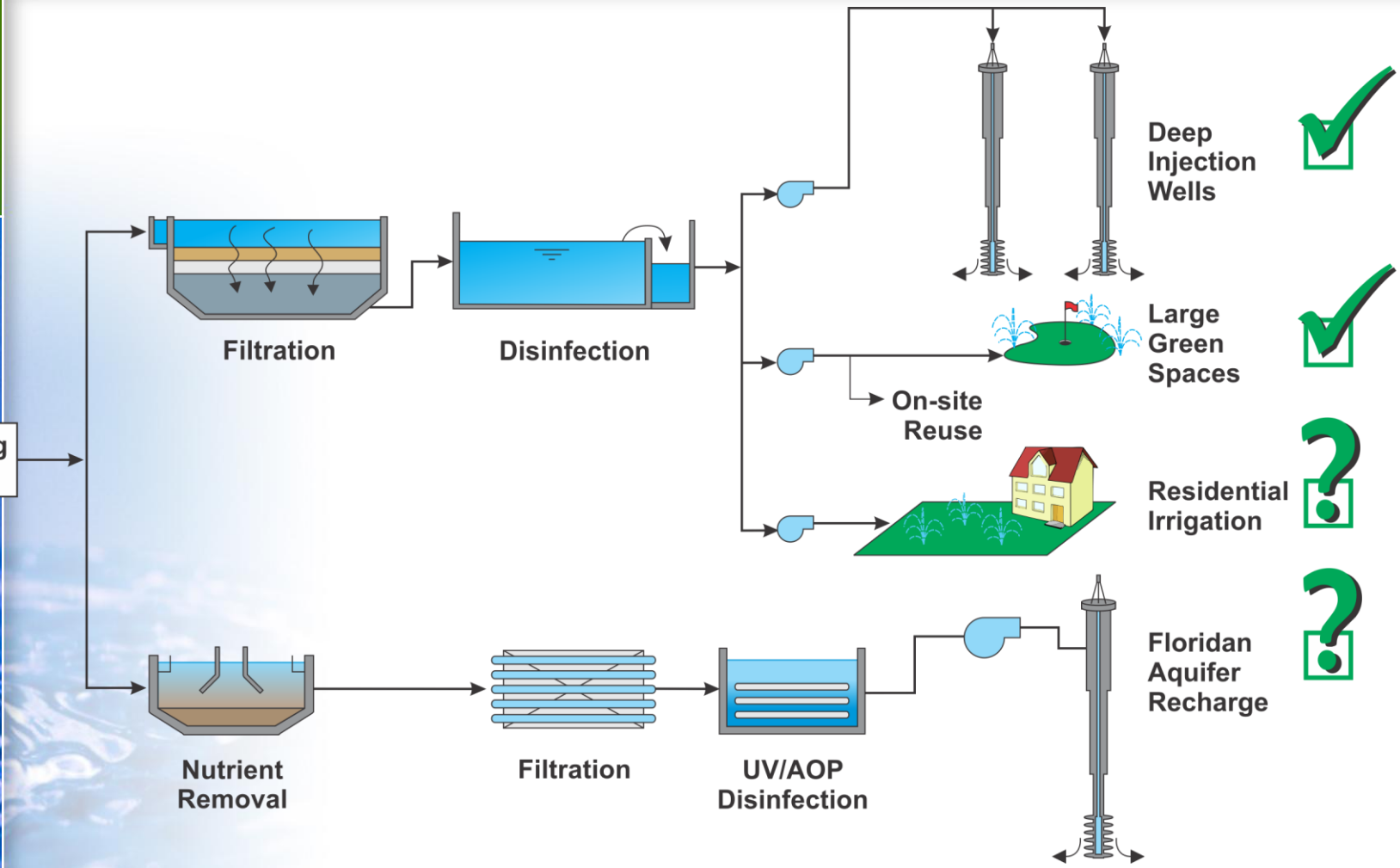
	Description	Estimated			
		Qualitative Value	Cost Value	Functional Total	Ranking
1	Biscayne Recharge	8.1	9.0	17.1	3
2	Floridan Recharge	8.8	10.0	18.8	2
3	Residential Reuse	10.0	9.0	19.0	1
4	Off Site Treatment / Biscayne Recharge	7.0	8.8	15.8	5
5	Off Site Treatment / Floridan Recharge	7.5	9.5	17.0	4
6	Off Site Treatment / Residential Reuse	6.9	8.7	15.6	6

- Top two compliance pathways to be further explored
- Floridan pilot testing is recommended
- All options include irrigation of large green spaces (≈ 8 mgd)

Potential large green space reuse sites ≈ 8 mgd



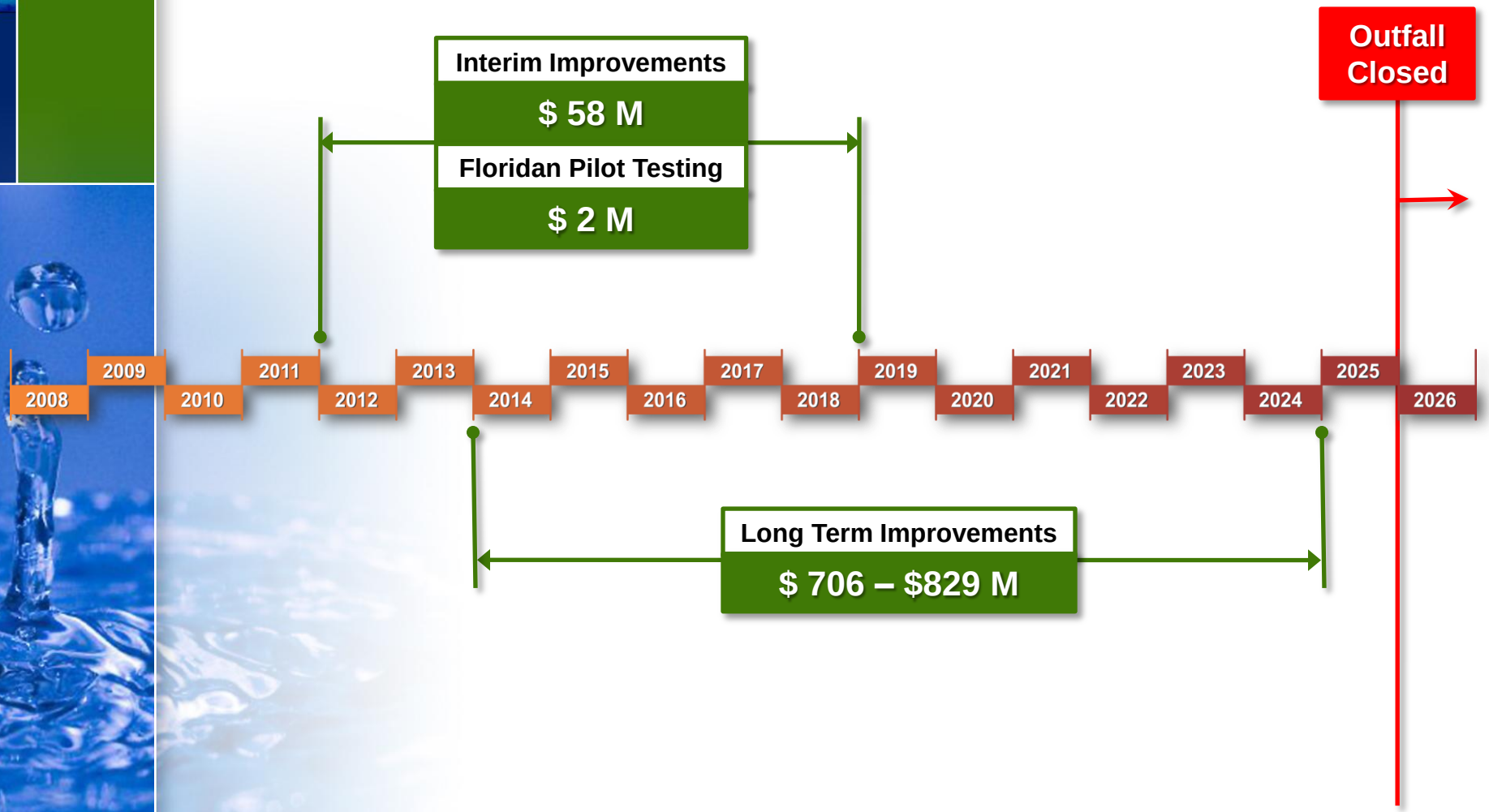
All considerations include expansion of large user reuse and injection well systems



What is the estimated overall cost?

Disposal Method	Estimated Construction Cost	
	Floridan Recharge	Residential Reuse
Interim Improvements		
• Booster Pumps at Existing Injection Wells	$14 million	
• Two Injection Wells and Interim HLD Facility	$44 million	
Long Term Program Improvements		
• Floridan Aquifer Recharge Pilot Testing	$2 million	
• Treatment Systems	$463 million	$343 million
• Effluent Disposal Capacity Replacement	$110 million	$97 million
• Reuse Distribution Systems	$133 million	$389 million
Totals (in 2009 dollars)	**$ 766 million**	**$ 889 million**

Implementation timetable



QUESTIONS?

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