



**City of Jacksonville**

**Microbe-Lift Pilot  
Project**

**Florida Stormwater Association Annual Conference**

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**June 20, 2019**

# BMPs & 2023 Reduction

Project	Total Reduction by 2015 (MT)	Total Reduction by 2023 (MT)
	Revised	Revised
Stormwater Projects	0.66	4.96
Septic Tank Phase-Out (LOC)	1.57	1.57
Septic Tank Phase-Out Projects	2.02	10.04
Public Education & Regulatory and Policy Implementation	3.29	3.29
Street Sweeping	5.55	5.55
BMAP Credit Trading	40.91	80.76
<b>TOTAL</b>	<b>53.45</b>	<b>106.17</b>



# Traditional BMPs

- **Stormwater Ponds – COJ is built out, not tremendous opportunity for regional projects.**
- **Street Sweeping – Doing it! Sweeping everything doesn't get the reductions necessary.**
- **Septic Tank Phase Out – Underway. Not enough money and time to meet the 2023 reductions.**



# Innovative Project Ideas

- **Microbe Lift:** Natural additive to wet detention ponds to increase treatment efficiency. Pilot project underway.
- **Distributed Sewer:** Under consideration to fast track septic tank conversions particularly in areas hard to reach with traditional infrastructure.
- **Optimizing Pond Management:** managing pond levels



# Microbe Lift Demonstration

- Free Trial
- 3 ponds – Riverside Pond, Pelican Pond, and Flamingo Pond
- Baseline sampling and (6) monthly pond samples
- Consistent reduction in Nitrate-Nitrite and TN
- Fecal coliform results were less linear and highly variable
- Not statistically valid





# Pond Treatment Efficiency Summary

Pond/ Location	Nitrate/Nitrate	TKN	TN	Fecal Coliform
Flamingo East	-55%	+ 61%	-12 %	-51%
Flamingo West	-55%	-33%	-43%	-87%
Pelican North	-84%	-56%	-63%	-95%
Pelican South	-83%	-57%	-65%	-80%
Riverside North	-99%	+ 122%	-86%	-94%
Riverside South	-99%	+18%	-84%	-91%

# Microbe- Lift Pilot Project Objectives

How Well Does It Work?

Reapplication Schedule?

BMAP Credit?

Cost Effective?

# Microbe-Lift

- **Project Partners**
  - **FDEP**
    - Discuss study parameters
    - Statistical significant data
    - Lab Support
  - **WMD**
    - Innovative Grant Monies (Construction)
    - Timeline & Project Deliverables
  - **FDOT**
    - NPDES MS4 & Funding Partner
    - Expand Selection of Ponds





# Pilot Project

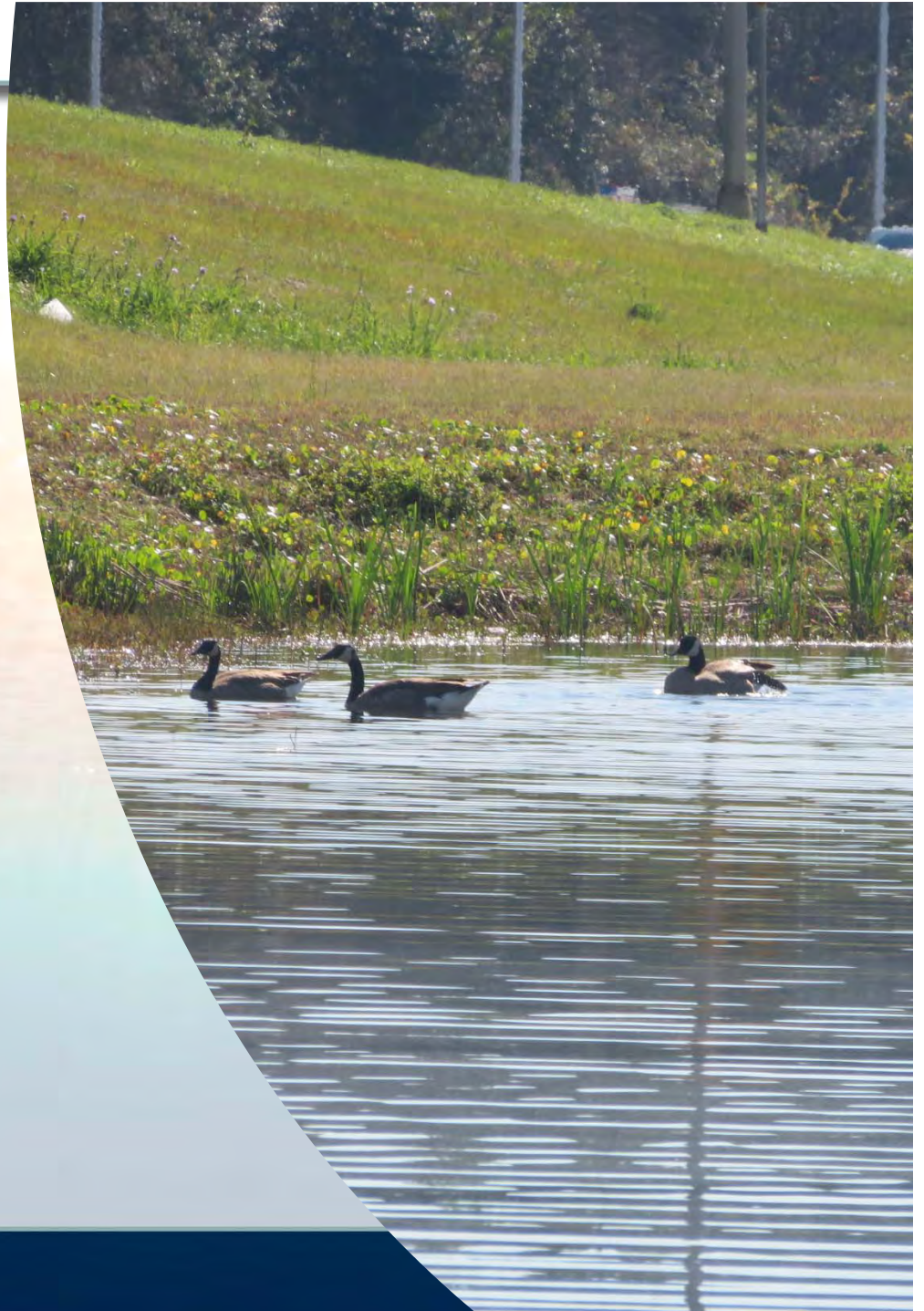
- **6 Months Baseline, 6 Months Post Treatment Sampling**
- **12 Months of Treatment**
  - **1<sup>st</sup> month is start up then weekly treatment**
  - **Remaining 11 are monthly treatment and sampling**
- **Sampling is done just before outfall structure**
- **Maintain typical pond maintenance throughout project**





# Microbe-Lift Pond Selection

- 18 Ponds
- Sampling Parameters:
  - Nutrients
  - Pesticides
  - Metals
  - Bacteria
  - Depth
- Treatment vs. control was determined via statistical analysis after 6 months of sampling data.





# Microbe-Lift Pilot Underway

- June is sixth month of baseline sampling.
- First treatment last week of June.
- Had to determine treatment to meet pilot requirements.
  - Consistent Dosage
  - Dosage Based on Acreage
  - Three Step Product Application
    - Seeding, Establishment, Maintenance

# Pilot Timelines

- **WMD grant compressed the study deliverables.**
- **Initial statistical (Before-After-Control-Impact ANOVA) after 18 months of sampling results to complete draft report timeline to WMD (Fall 2020).**
- **After the conclusion of the 23 months of sampling, the report will be updated with any additional information (Spring 2021).**





# Measurements of Success

- Pilot substantiates Total Nitrogen water quality improvements
- Obtain FDEP BMAP Credit as Non-Structural BMP
- Cost Effective
- Microbe-Lift Application + 250 City Ponds = # MT Improvement

