



Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration

***Upper Wakulla River and
Wakulla Springs
Basin Management Action Plan
(BMAP)***

***Moira R. Homann
January 16, 2018***





Agenda

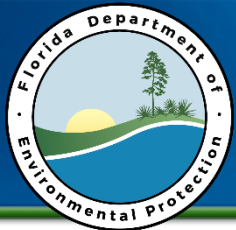
1. Welcome and Opening Remarks.
2. Timing
3. New Items/Discussion.
 - a. Refined Nitrogen Source Inventory Loading Tool (NSILT).
 - b. Review of the Draft BMAPs – Crystal River/Kings Bay, Volusia Blue Spring.
 - c. Current Load and TMDL Load Estimates.
 - d. OSTDS Source Reductions Approaches.
4. Public Comments.
5. Adjourn.



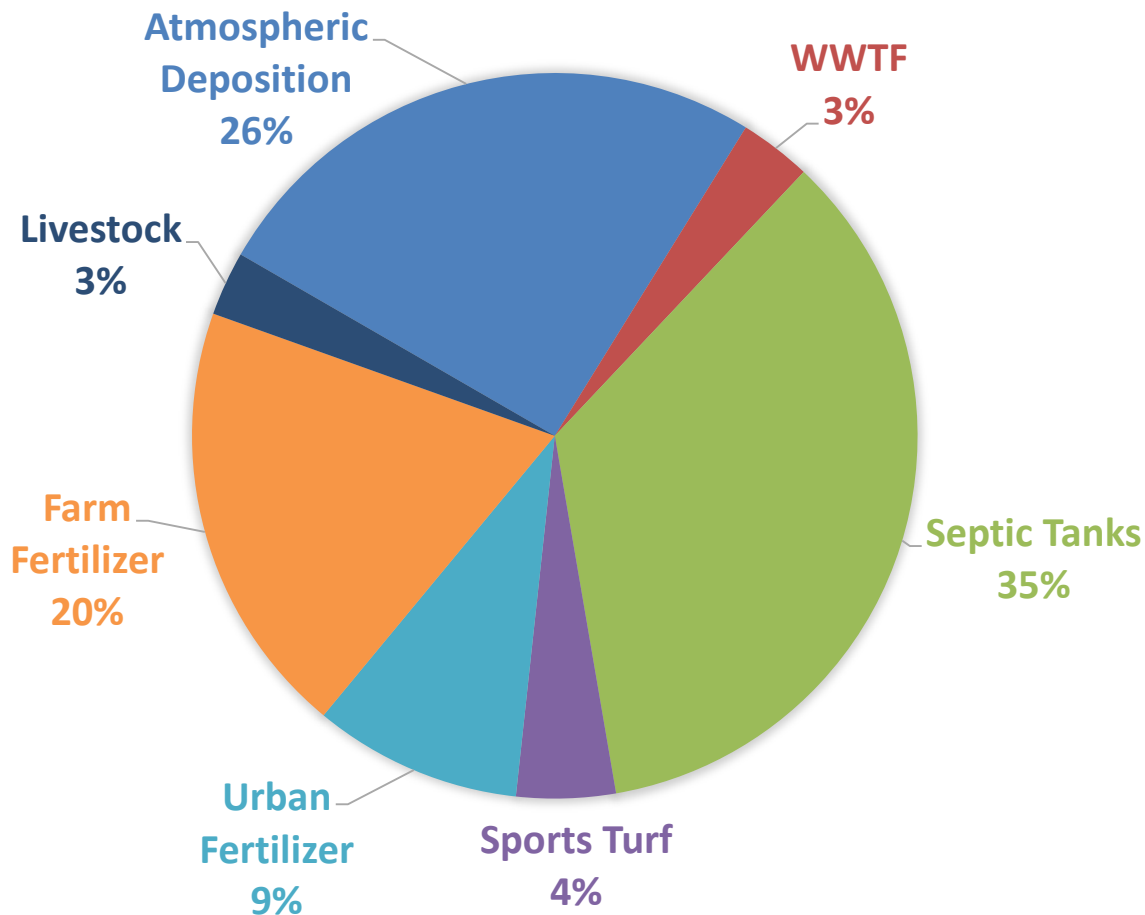
Timing



**DON'T KEEP
CALM!
TIME IS
RUNNING
OUT!**



Refined NSILT Estimated Loading to Groundwater



- Eliminated the “Effective septic population factor”
- Included golf course fertilization rates provided by CoT
- Removed Sinking Lakes category
- Updated fertilized pasture acreage



Comparison between 2017 and 2018 NSILT

Source Category	2017 Estimated Load	2017 Percent of Total	2018 Refined Estimated Load	2018 Refined Percent of Total
Septic Systems	240,657	29	293,400	35
Atmospheric Deposition	212,134	26	212,134	26
Farm Fertilizer	166,138	20	161,985	20
Urban Fertilizer	77,282	10	77,282	9
Sinking Streams/Lake Seepage	30,751	4	-	-
Wastewater Treatment Facilities	26,697	3	26,697	3
Sports Turf Fertilizer	42,399	5	36,752	4
Livestock Waste	23,840	3	23,840	3
Totals	819,898		832,090	

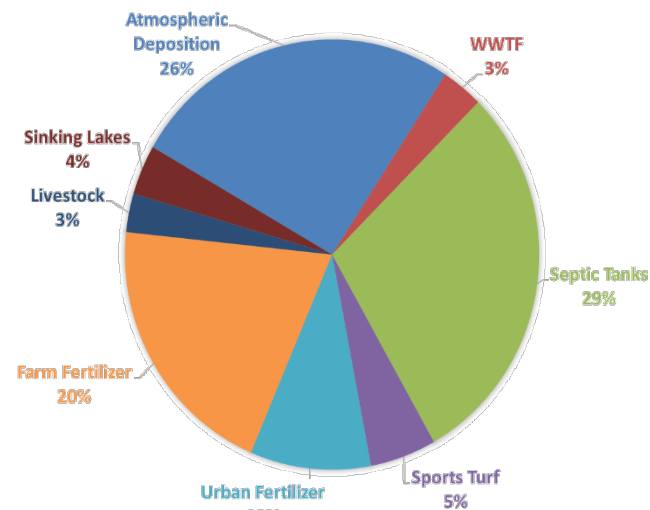


Figure 1: Relative percent contributions of nitrogen loading to groundwater for source categories in the Wakulla BMAP from the 2017 NSILT

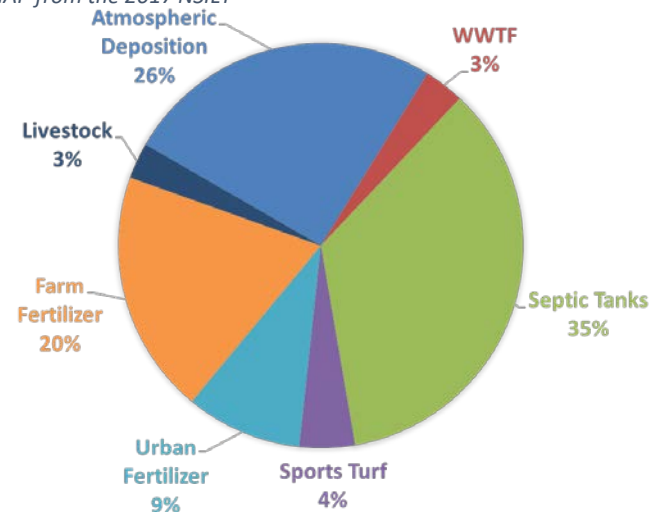


Figure 2: Relative percent contributions of nitrogen loading to groundwater for source categories in the Wakulla BMAP from the refined 2018 NSILT



Review Draft BMAPs

- Crystal River/Kings Bay.
- Volusia Blue Spring.



Draft Crystal River/Kings Bay BMAP - OSTDS Reductions Approaches

- This BMAP lists 12 specific projects that reduce OSTDS loading by 103,868 pounds of nitrogen per year (lb-N/yr).
- All OSTDS in PFA must be enhanced or sewerer within 20 years.
- If sewer is projected in a BMAP project, a conventional system can be installed or repaired in the meantime.

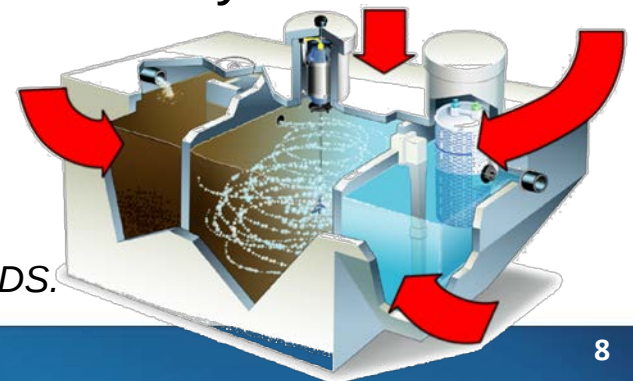




Draft Crystal River/Kings Bay BMAP - OSTDS Reductions Approaches

- OSTDS must be enhanced or sewerred on all lots within the priority focus area (PFA) (less than one acre and over one acre).
- Enhanced OSTDS must meet or exceed the National Sanitation Foundation (NSF) Standard 245 nitrogen removal rate including (listed in no particular order):
 - Aerobic treatment units (ATUs).
 - Performance-based treatment systems (PBTS).
 - In-ground nitrogen reducing biofilters.
 - In-tank nitrogen removing biofilters.
- A 24-inch separation between the bottom of the drainfield and the seasonal high water table may be necessary with certain technologies.

Example of an existing technology to enhance an OSTDS.





Draft Volusia Blue Springs BMAP – OSTDS Reductions Approaches

- All OSTDS must be enhanced or sewerer within 20 years.
- If sewer is projected in a BMAP project, a conventional system can be installed or repaired in the meantime.





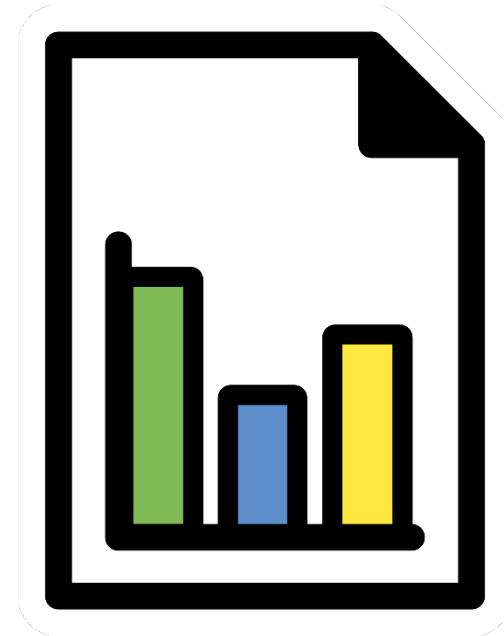
Draft Volusia Blue Springs BMAP – OSTDS Reductions Approaches

- OSTDS must be enhanced or sewerred on all lots less than one acre within the PFA [PFA] (but not on lots over one acre).
- Enhanced OSTDS must meet or exceed the NSF Standard 245 nitrogen removal rate including (in no particular order):
 - ATUs.
 - PBTS.
 - In-ground nitrogen reducing biofilters.
 - In-tank nitrogen removing biofilters.
- A 24-inch separation between the bottom of the drainfield and the seasonal high water table may be necessary with certain technologies.



Draft Approaches to Achieve Reductions and Restoration

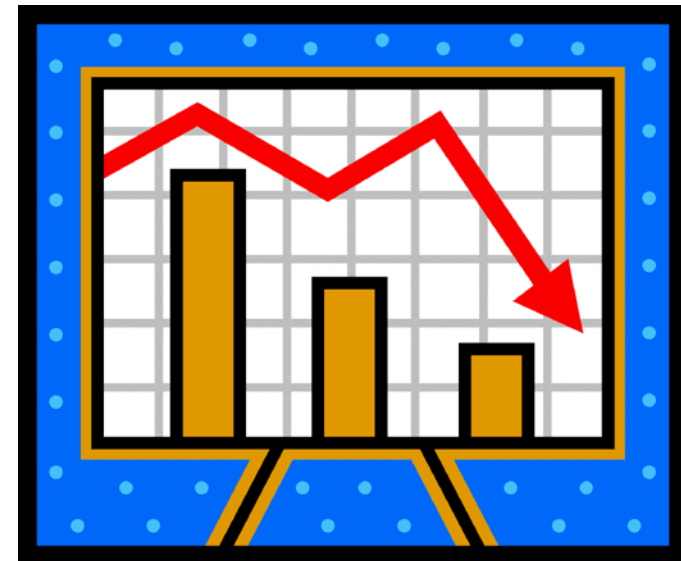
- Reductions.
- BMAP Policies.





Load Calculations

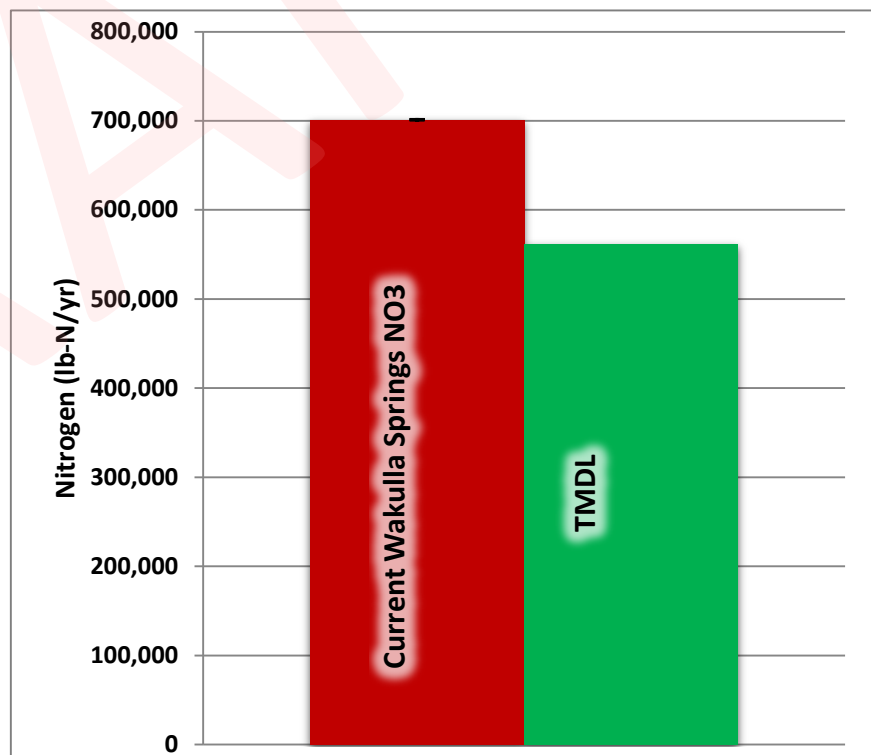
- Total load reduction required to meet TMDL:
 - Difference between estimated total load at the spring vent (current concentration x current flow), and the TMDL load (target concentration x current flow).
- Reductions from projects:
 - Estimated reductions resulting from projects submitted by stakeholders.
 - Existing and planned efforts.
 - Attenuation and recharge discounts applied to reduction estimates at the ground surface.
- Remaining reduction balance (Gap):
 - Estimated by subtracting the total reduction required from the estimated reductions from projects submitted.





Current Load Compared to the TMDL

Load	Nitrogen Loads (lbs-N/yr)	Data Source
Total Load at Spring Vent	701,411	Upper 95 % confidence interval - Nitrate data from 2014-2017 and flow data from 2014-2017
TMDL	561,847	Upper 95 % confidence interval - flow data from 2014-2017 and 0.35 mg/L
Total Required Reduction	139,564	





Reduction Milestones

- To achieve TMDL, BMAP implementation will be a 20-year process.
- Wakulla Springs BMAP will define nitrogen reduction milestones:
 - 30 % reduction within 5 years – 41,869 lb-N/yr.
 - 50 % reduction within 10 years – 69,782 lb-N/yr.
 - 20 % reduction within 15 years – 27,913 lb-N/yr.
 - Total reduction – 139,564 lb-N/yr.





Example – Crystal River/ Kings Bay

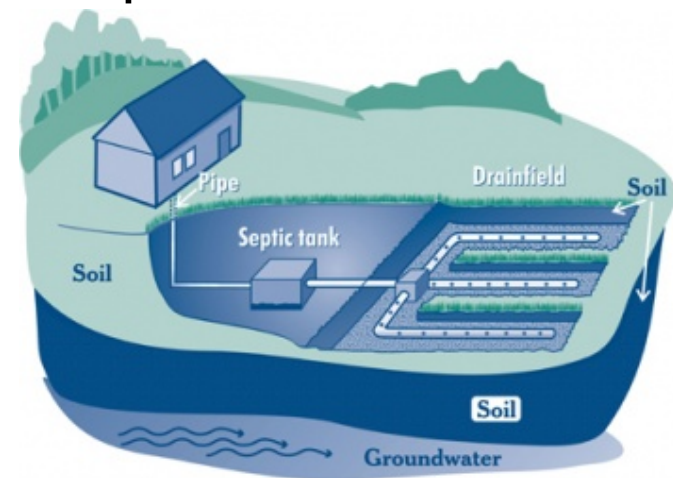
Gap Analysis		
Nitrogen Source	Credits Based on Projects Submitted (lb-N/yr)	Description
OSTDS	103,868	Credits identified for stakeholder OSTDS projects (enhancement or sewer)
UTF (Urban Turfgrass)	4,050	DEP approved credits (up to 6%) for public education activities as well as credits identified for stakeholder stormwater projects
AD (Atmospheric Deposition)	–	No projects/reductions
FF (Farm Fertilizer)	10,604	15% BMP credit on FF load to groundwater, assuming 100% owner-implemented BMPs on all fertilized lands
STF (Sports Turfgrass)	4,886	6% BMP credit for sports fields and 10% BMP credit for golf courses on STF load to groundwater, assuming 100% BMP implementation on golf courses and sports fields
Livestock	3,079	10% BMP credit on load to groundwater, assuming 100% owner-implemented BMPs at all livestock facilities
WWTF (Wastewater Treatment Facility)	9,322	Achieved by BMAP WWTF policy if BMAP-wide (achieving 3 or 6 mg/L)
Total Credits	135,810	
Required Reduction	274,000	
Load Remaining	138,190	← GAP

How to address the remaining 138,190 lbs/yr?



OSTDS Approaches to Achieve the Reduction

- Estimate reductions to groundwater from BMAP projects addressing OSTDS sources.
- Gap analysis: From the remaining OSTDS, evaluate the potential for nitrogen reductions based on OSTDS enhancement or replacement (sewer) through remediation options.
 - Provides an estimate of what is possible, if additional projects were planned.





OSTDS Calculations

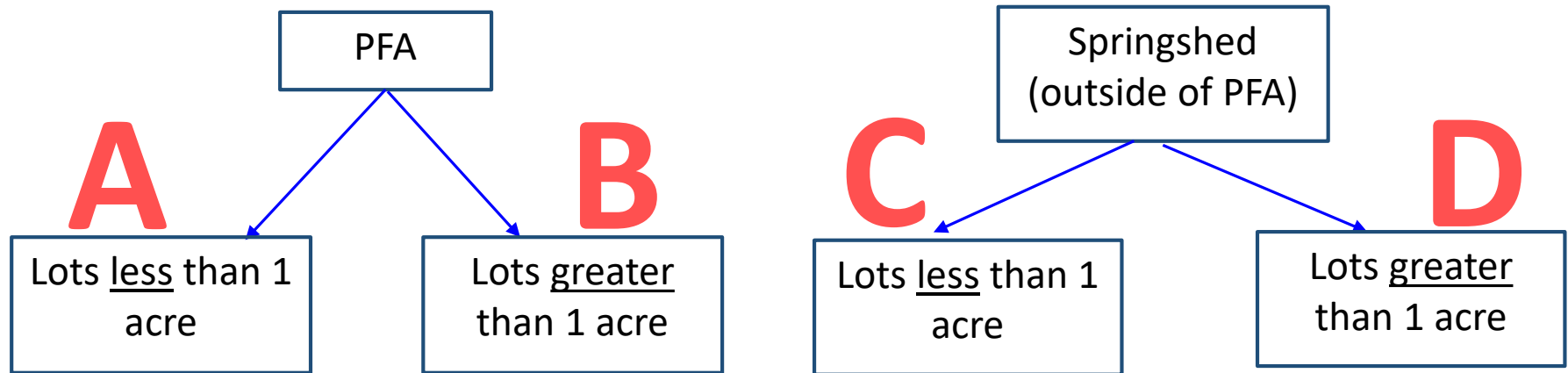
Factors Applied to Land Inputs	Factors
Attenuation	0.5
Low Recharge	0.1
Medium Recharge	0.4
High Recharge	0.9

OSTDS Load Adjustments	
Nitrogen Input from tank (lb-N/yr)	18
Load Attenuation Factor	9

Recharge Category	Conventional OSTDS Load to GW (lb-N/yr/tank)	Improvement to GW (lb-N/yr/tank)	
		Enhanced OSTDS	Replaced OSTDS
Low Recharge	0.9	0.6	0.9
Medium Recharge	3.6	2.3	3.4
High Recharge	8.1	5.3	7.7



BMAP Policies – OSTDS





Options to Reduce Remaining Load

Recharge	All PFAs lots less than 1 acre			All PFAs lots greater than 1 acre			Total OSTDS in PFA
	A Number of OSTDS	Load Reductions Through Enhancement	Load Reduction Through Sewering	B Number of OSTDS	Load Reductions Through Enhancement	Load Reduction Through Sewering	
High	5,982	31,495	46,031	5,935	31,248	45,670	11,917
Medium	0	0	0	0	0	0	0
Low	0	0	0	0	0	0	0
Total	5,982	31,495	46,031	5,935	31,248	45,670	11,917

Recharge	All OSTDS lots less than 1 acre			All OSTDS lots greater than 1 acre			Total OSTDS in BMAP
	C Number of OSTDS	Load Reductions Through Enhancement	Load Reduction Through Sewering	D Number of OSTDS	Load Reductions Through Enhancement	Load Reduction Through Sewering	
High	8,558	45,058	65,854	8,272	43,552	63,653	16,830
Medium	12,114	28,347	41,430	9,035	21,142	30,900	21,149
Low	5,046	2,952	4,314	6,982	4,084	5,970	12,028
Total	25,718	76,357	111,598	24,289	68,778	100,522	50,007



Options to Reduce Remaining Load

Recharge	Outside the PFA (In the BMAP) lots less than 1 acre			Outside the PFA (In the BMAP) lots greater than 1 acre			
	Number of OSTDS	Load Reductions Through Enhancement	Load Reduction Through Sewering	Number of OSTDS	Load Reductions Through Enhancement	Load Reduction Through Sewering	Total OSTDS in BMAP
High	2,576	13,563	19,822	2,338	12,310	17,991	4,914
Medium	12,113	28,344	41,426	9,035	21,142	30,900	21,148
Low	5,046	2,952	4,314	6,982	4,084	5,970	12,028
Total	19,735	44,859	65,563	18,355	37,536	54,860	38,090



Possible Wakulla OSTDS Approaches

- All OSTDS must be enhanced or sewerred within 20 years.
- If sewer is projected in a BMAP project, a conventional system can be installed or repaired in the meantime.
- Determine geographic extent of enhancement / sewer requirement:
 - Less than 1 acre lots within PFAs.
 - All lots within PFAs.
 - Additional lots outside PFAs.
- Enhanced OSTDS must meet or exceed the NSF Standard 245 nitrogen removal rate or another alternative.



Closing the OSTDS Gap

- BMAP will contain an OSTDS remediation plan.
- DEP & FDOH will work together to implement it.
- To be most successful, local funding needs to be available to homeowners:
 - For example: grant programs for assisting homeowners, with costs administered by county.
 - Best if administered at the local level.
 - State funding for such grant programs is available.



OSTDS Options

- OSTDS **enhancement** (defined as 65+ % nitrogen reduction).
- FDOH approved options in Florida:
 - Aerobic Treatment Units (ATU) meeting the NSF 245 standard.
 - Passive nitrogen-reducing, in-tank systems tested by FDOH study:
Florida Onsite Sewage Passive Nitrogen Reduction Strategies Study
- FDOH innovative system testing process is evaluating more options, such as:
 - Performance based treatment systems (PBTS).
 - Media filter systems
 - <http://www.floridahealth.gov/environmental-health/onsite-sewage/products/documents/pbts-components.pdf>
- OSTDS **sewering**.
 - BMAP has new wastewater disposal requirements for nitrogen.



OSTDS Remediation Plan

- Which systems must be enhanced or sewerer?
- What is the deadline for enhancing or sewerer?
 - Upon needing a permit for new, modified, or repaired OSTDS.
 - Unless sewer is available or described as becoming available in a BMAP project.
 - Backstop: but no later than 20 years after BMAP adoption.
- When does this start?
 - As soon as the BMAP is adopted.
 - By law, BMAP must be adopted before July 1, 2018.



Statewide TMDL, BMAP, Minimum Flows and Levels (MFLs) Annual Report

- 403.0675(1), Florida Statute – will include status of MFLs, TMDLs, BMAPs.
- Replacement of individual BMAP annual progress reports.
- Annual meetings will continue.
- Calendar year reporting.
- Report will contain project information: funding, proposed priority ranking for implementation.
- Progress made towards restoration goals.
- Info needed will include: entity activities, compliance, project information, and milestones.
- Report is due to Governor's Office July 1, 2018 and every year thereafter.
- Information was requested in late November, due by January 31st.
- Project information from November 1, 2016 to December 31, 2017.



Wrap Up

- Action Items.
- Next meetings.
 - **Tentative** Mid/late February.
 - Short meeting on OSTDS.
 - Meeting on "all sources" presentation where we cover the rest of the source reductions and the gaps.
 - April 2018?
 - Public meeting on the draft BMAP document.
- Other comments/announcements.

A scenic view of a lake with a wooden dock in the foreground, surrounded by dense green trees and a blue sky with white clouds. The water is calm, reflecting the sky and the surrounding greenery. The dock has a small blue flag on it. In the background, there are more docks and a line of trees.

Thank you!