



**AGENDA REPORT
May 8, 2018**

SUBJECT:

Ordinance Establishing a 150-Day Moratorium on New Conventional Septic Systems or Any System Which Does Not Provide a Minimum of 65% Total Nitrogen Reduction On The Barrier Islands Including Merritt Island and Within 50 Meters of the Indian River Lagoon (IRL) and Connected Waterways Countywide. (First Reading)

FISCAL IMPACT:

FY 17-18 – No Impact

FY 18-19 – No Impact

DEPT/OFFICE:

Natural Resources Management

REQUESTED ACTION:

It is requested the Board conduct a public hearing of a 150-day county-wide moratorium on septic systems having the greatest impact on the IRL.

SUMMARY EXPLANATION and BACKGROUND:

At the April 10, 2018 meeting, the BoCC requested a legal opinion on the County's authority to regulate septic systems and whether a moratorium would be feasible. The County Attorney responded that a limited moratorium, which would allow development to occur through the use of a sewer system, alternative septic system, or increased setback from water bodies, is legal and limits liability or claim of taking of private property.

The BoCC in regular session on April 24, 2018, authorized the advertising of a proposed temporary moratorium ordinance limiting certain kinds of septic systems in areas most likely to impact the Indian River Lagoon. The proposed Ordinance was advertised on April 28, 2018.

This ordinance proposes an overlay area on the barrier islands, including Merritt Island, and within 50 meters of the Indian River Lagoon System, including all natural and manmade tributaries. A 150-day moratorium would apply within the overlay area for new onsite sewage treatment and disposal systems that are not capable of reducing total nitrogen in effluent by at least 65%.

Nitrogen is contributing to the pollution in the Indian River Lagoon System. Nitrogen loading from septic drainfields is a recognized source of pollution in the IRL through ground water pollution migration. For the IRL waters in Brevard County, it has been determined that septic drainfields contribute approximately 18.8% of the total nitrogen pollution and 32.7% of all new nitrogen pollution. There are existing scientific studies supporting a moratorium in sensitive environmental areas. Prohibiting conventional septic systems while allowing the alternative septic systems could provide immediate additional

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protections to the Indian River Lagoon.

Thus, a regulatory option to increase protection of the IRL is to temporarily prohibit the installation of new conventional septic systems while allowing the use of alternative systems achieving 65% nitrogen reduction or greater. Options for development during the 150-day moratorium include alternative septic systems designed to reduce nitrogen and hooking up to sewer systems.

The BoCC can reduce the overlay area or restrict the moratorium to the unincorporated area at the public hearing. Municipalities can enact an ordinance to opt out of a county-wide ordinance should they disagree.

This is the first of two required public hearings. The second public hearing is scheduled for May 22, 2018 at 9:00 A.M.

The Local Planning Agency (LPA) will hold a public hearing on May 7, 2018. The Building and Construction Advisory Committee (BCAC) will hold a public hearing on May 9, 2018.

ATTACHMENTS:

Description

- **Proposed Ordinance No. 2018-**
- **Attachment A - Charts showing Nitrogen Sources to the IRL. First chart shows total nitrogen polluting the IRL. Second chart shows new nitrogen entering the IRL.**
- **Attachment B - FL Dept. of Health List of Approved Performance-Based Treatment Systems. All systems meeting 65% nitrogen reduction are highlighted.**
- **Attachment C - FL Dept. of Health List of Approved Aerobic Treatment Units Meeting 65% Nitrogen Reduction.**



Tammy Rowe, Clerk to the Board, 400 South Street • P.O. Box 999, Titusville, Florida 32781-0999

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May 9, 2018

M E M O R A N D U M

TO: Virginia Barker, Natural Resources Management Director

RE: Item IV.A., First Public Hearing for Temporary Septic Moratorium

The Board of County Commissioners, in regular session on May 8, 2018, conducted the first of two public hearings of a 150-day Countywide moratorium on septic systems having the greatest impact on the Indian River Lagoon; and authorized you to bring the ordinance back to the next Regular meeting on May 22, 2018.

Your continued cooperation is greatly appreciated.

Sincerely yours,

BOARD OF COUNTY COMMISSIONERS
SCOTT ELLIS, CLERK

Tammy Rowe

Tammy Rowe, Deputy Clerk

/cmw

ORDINANCE 2018-_____

AN ORDINANCE ESTABLISHING A 150 DAY TEMPORARY MORATORIUM ON THE INSTALLATION OF NEW ONSITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS (OSTDS) OR CONVENTIONAL SEPTIC SYSTEMS THAT ARE NOT CAPABLE OF REDUCING TOTAL NITROGEN IN EFFLUENT BY AT LEAST 65% ON THE BARRIER ISLANDS INCLUDING MERRITT ISLAND AND WITHIN 50 METERS OF THE INDIAN RIVER LAGOON SYSTEM INCLUDING ALL NATURAL AND MANMADE TRIBUTARIES; PROVIDING FINDINGS OF FACT; PROVIDING DEFINITIONS; PROVIDING FOR EXEMPTIONS; PROVIDING FOR EXTENSIONS, EXPIRATION; PROVIDING FOR CONFLICTING PROVISIONS; PROVIDING FOR SEVERABILITY; PROVIDING FOR AREA ENCOMPASSED AS COUNTY WIDE, INCLUDING MUNICIPALITIES AND THE UNINCORPORATED AREAS; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Indian River Lagoon (IRL) is one of the most biologically diverse estuaries in North America, supporting more than 2000 species of plants, 600 species of fish, 300 species of birds and 53 threatened or endangered species; and

WHEREAS, the annual economic activity generated from IRL-related recreational, tourism, commercial industries in Brevard County was estimated at \$1,111,737,960 in 2016¹; and

WHEREAS, the IRL has a long history of poor water quality and environmental degradation caused by multiple pollution sources; and

WHEREAS, in 1987 the Florida Legislature enacted the Surface Water Improvement and Management Act (SWIM Plan) for the restoration and protection of water quality of waterbodies of statewide significance, including the Indian River Lagoon System (IRL). Ch. 87-97, Laws of Florida. The SWIM Plan considered multiple pollution sources, including septic tanks; and

WHEREAS, in 1990 the Florida Legislature amended the SWIM Plan to specifically require further study and protection of the IRL. Ch. 90-262, Laws of Florida. Septic tanks were identified as continuing threats to the water quality of the IRL; and

WHEREAS, also in 1990, the entire Indian River Lagoon spanning five counties, Volusia, Brevard, Indian River, St. Lucie and Martin, was incorporated into the U.S.

¹ "Indian River Lagoon Economic Valuation Update" Table 9, Final Report 08-26-2016, Prepared by East Central Florida Regional Planning Council Treasure Coast Regional Planning Council

Environmental Protection Agency's (EPA) National Estuary Program for watershed restoration by its designation as an estuary of national significance. A large portion of the entire system, 71% of its area and nearly half its length, is within Brevard County; and

WHEREAS, since 2007, the IRL has been listed on EPA's Verified List of Impaired Waters due to excess levels of both nitrogen and phosphorus and the County is subject to maintaining total maximum daily load (TMDL) levels to comply with the Clean Water Act. TMDL's are established to define the maximum pollutant loadings a waterbody can assimilate without showing signs of impairment.²; and

WHEREAS, nutrient loading from septic drainfields is a recognized source of pollution in the IRL through ground water pollution migration³; and

WHEREAS, pollution from septic systems varies based on many factors including proximity to surface water, soil hydrologic group, depth to groundwater, density of development, age and maintenance history of the septic system, as well as soil organic matter, porosity, and hydraulic conductivity versus dispersivity⁴; and

WHEREAS, the barrier islands of Brevard County contribute groundwater flow to the IRL and also exhibit many of the conditions limiting the effectiveness of septic drainfields in removing nitrogen and bacterial contaminants from the discharge to groundwater⁵; and

² "TMDL Report – Nutrient and Dissolved Oxygen TMDL's for the Indian River Lagoon and Banana River Lagoon" by Xueqing Gao, Florida Department of Environmental Protection, March 2009; "Draft Integrated Assessment Waster Quality Report, Group 5 Indian River Lagoon Basin" Florida Department of Environmental Protection, September 27, 2017.

³ "Refining the Indian River Lagoon TMDL Technical Memorandum Report: Assessment and Evaluation of Model Input Parameters Final Report" by Environmental Research and Design, Inc., Revised March 2016

⁴ Ye, Ming & Sun, Huaiwei & Hallas, Katie. (2017). Numerical estimation of nitrogen load from septic systems to surface water bodies in St. Lucie River and Estuary Basin, Florida. Environmental Earth Sciences. 76. 10.1007/s12665-016-6358-y; Martin County Septic System Elimination Final Report February 2015, prepared by Captec Engineering, Inc for Martin County; Sayemuzzaman, Mohammad and Ming Ye. August 2015. "Estimation of Nitrogen Loading from Converted Septic Systems (2013-14 and 2014-15) to Surface Waterbodies in Port St. Lucie, FL." Department of Scientific Computing, Florida State University. Prepared for the Florida Department of Environmental Protection. Tallahassee, Florida; Florida Department of Health (FDOH). 2015. Florida Onsite Sewage Nitrogen Reduction Strategies Study, Final Report; Wang, Liying, Ming Ye, J. Fernando Rios, and Paul Z Lee (March 2012) Sensitivity Analysis and Uncertainty Assessment for AcrNLET-Estimating Nitrate Load from Septic Systems to Surface Water Bodies Hazen and Sawyer. 2015. Evaluation of Full Scale Prototype Passive Nitrogen Reduction Systems (PNRS) and Recommendations for Future Implementation. Report to the Florida Department of Health. Report: http://www.floridahealth.gov/environmentalhealth/onsitesewage/research/_documents/rnac/hazensawyervolireportmall.pdf.

Appendices: http://www.floridahealth.gov/environmentalhealth/onsitesewage/research/_documents/rnac/hazensawyervolireportappend.pdf.

⁵ Michael A. Mallin and Matthew R. McIver 2012. "Pollutant impacts to Cape Hatteras National Seashore from urban runoff and septic leachate", Marine Pollution Bulletin 64 (2012) 1356-1366 ; Han Xiao, et al 2016. "Assessing the impacts of sea-level rise and precipitation change on the surficial aquifer in the low-lying coastal alluvial plains and barrier islands, east-central Florida (USA)", Hydrogeology Journal (2016) 24:1791-1806

WHEREAS, in 2016, after a five-year series of algal blooms and fish kills in the IRL, the Board of County Commissioners enacted Ordinance 2016-15 to authorize a referendum for the imposition of a half-cent sales tax for ten years to fund water quality restoration projects for the IRL; and

WHEREAS, Ordinance 2016-15 also adopted the "Save Our Lagoon Project Plan" prepared by Tetra Tech, Inc. and Closewaters, LLC, July 2016 (SOIRL Plan). The SOIRL Plan compares the contributing sources of pollution, based on available scientific literature, and proposes cost-effective projects to achieve water quality restoration goals; and

WHEREAS, the overall value of the IRL is dependent on successful water quality restoration. Tetra Tech estimates approximately \$2 billion in benefits from restoration and an estimated \$4 billion in damages if the IRL is not brought back to health during the next decade.⁶

WHEREAS, based on all the major sources of pollution quantified in the SOIRL Plan, approximately 18% of total nitrogen (TN) loading in the IRL is from septic systems, compared to other sources; and

WHEREAS, a recent state-funded study of the impact of septic systems on the IRL conducted in Port St. Lucie found that the average septic system within 50 meters of the IRL contributes 27lbs of total nitrogen (TN) per year⁷; and

WHEREAS, the SOIRL Plan includes \$63,956,000⁸ in septic-to-sewer and septic enhancement projects that target highest risk neighborhoods and individual systems located within the 50 meter area within the IRL, respectively; and

WHEREAS, based on scientific literature, a properly functioning conventional septic system reduces total nitrogen (TN) from 30-40%.⁹ In adverse conditions, reduction has been measured at 0-20%. The best available studies estimate a 10% reduction in nitrogen within a properly maintained tank versus and improperly maintained tank. The remaining 20-30% of nitrogen removal occurs in a properly located and functioning drainfield¹⁰; and

⁶ See Section 1.1 Return on Investment and Economic Value, SOIRL Plan July 2016.

⁷ See Section 4.1.4 SOIRL Plan 2018 Update, April 2018: Sayemuzzaman, Mohammad and Ming Ye. August 2015. "Estimation of Nitrogen Loading from Converted Septic Systems (2013-14 and 2014-15) to Surface Waterbodies in Port St. Lucie, FL." Department of Scientific Computing, Florida State University. Prepared for the Florida Department of Environmental Protection. Tallahassee, Florida.

⁸ Table ES-1: Summary of Project Types, Costs and nutrient Reductions in the Save Our Indian River Lagoon Project Plan, SOIRL Plan 2018 Update, April 2018.

⁹ "Achieving Nitrogen Loading Reduction through Onsite Wastewater Treatment Technologies." Florida Onsite Wastewater Association, Inc.

¹⁰ A Review of Nitrogen Loading and Treatment Performance Recommendation for Onsite Wastewater Treatment Systems in the Wekiva Study Area." Anderson, Damann L. of Hazen and Sawyer, P.C. 2006, Prepared for the Florida Department of Health. Tallahassee, Florida.

WHEREAS, there are alternative septic systems designed to specifically provide at least 65% total nitrogen reduction through multi-stage treatment processes. According to the Brevard County Health Department and the Florida Onsite Wastewater Association, Inc., alternative septic systems, such as NSF 245-certified aerobic treatment units and engineered performance based systems, are capable of reducing total nitrogen in effluent by at least 65% and would provide significant nitrogen reduction results in these areas. See fn.9; and

WHEREAS, based on these and related concerns, the Board of County Commissioners requires additional time to review the regulations and policies at issue to ensure that the vision of clean, safe water in the IRL consistent with the goals of the SOIRL Plan are being met to the Board's satisfaction; and

WHEREAS, specific authority for this ordinance includes, but is not limited to Article VIII, Section 1, Florida Constitution of 1968; Chapters 125 and 163 and Section 381.0065(4)(r), Florida Statutes; and

WHEREAS, the process for completing a review of applicable regulations and policies regarding septic systems in Brevard County is expected to take about one hundred and fifty (150) days; and

WHEREAS, the Brevard County Board of County Commissioners finds that based on the foregoing reasons for the temporary moratorium, this Ordinance will promote the public health, welfare, safety and economic benefit of the IRL and the County as a whole.

NOW, THEREFORE, BE IT ORDAINED by the Board of County Commissioners of Brevard County, Florida, that:

SECTION 1. FINDINGS OF FACT.

The recitals set forth above are hereby adopted as the Board's initial findings of fact in support of the temporary moratorium established by this Ordinance. The Board may, in its discretion, adopt additional findings after the public hearings.

SECTION 2. DEFINITIONS.

(A) *Barrier islands* means all islands, natural and manmade, between the mainland and the Atlantic Ocean, to include: Merritt Island, Cape Canaveral, Cocoa Beach, Satellite Beach, Indian Harbour Beach, Melbourne, Indianalantic, Melbourne Beach and all other unincorporated areas on the barrier islands.

(B) *Conventional septic system* means the simplest septic system that can be permitted pursuant to state regulations, typically consisting of a septic tank and subsurface soil dispersal system with no additional removal function for nitrogen.

(C) *Indian River Lagoon System or IRL* means the Indian River, the Banana River, Mosquito Lagoon, Newfound Harbor and Sykes Creek and their natural and manmade tributaries and connected surface waterbodies.

(D) *Onsite sewage treatment and disposal system or OSTDS* includes *conventional septic systems* and is defined in Section 381.0065(2)(k), Florida Statutes, to mean “a system that contains a standard subsurface, filled, or mound drainfield system; an aerobic treatment unit; a graywater system tank; a laundry wastewater system tank; a septic tank; a grease interceptor; a pump tank; a solids or effluent pump; a waterless, incinerating, or organic waste-composting toilet; or a sanitary pit privy that is installed or proposed to be installed beyond the building sewer on land of the owner or on other land to which the owner has the legal right to install a system. The term includes any item placed within, or intended to be used as a part of or in conjunction with, the system. This term does not include package sewage treatment facilities and other treatment works regulated under chapter 403.”

(D) *Shoreline* means the mean annual flood line of the Indian River Lagoon System, as defined in Section 381.0065(2)(j), Florida Statutes, to be “the elevation determined by calculating the arithmetic mean of the elevations of the highest yearly flood stage or discharge for the period of record, to include at least the most recent 10-year period. If at least 10 years of data is not available, the mean annual flood line shall be as determined based upon the data available and field verification conducted by a certified professional surveyor and mapper with experience in the determination of flood water elevation lines or, at the option of the applicant, by State Department of Health personnel. Field verification of the mean annual flood line shall be performed using a combination of those indicators listed below that are present on the site, and that reflect flooding that recurs on an annual basis. In those situations where any one or more of these indicators reflect a rare or aberrant event, such indicator or indicators shall not be utilized in determining the mean annual flood line. The indicators that may be considered are:

1. Water stains on the ground surface, trees, and other fixed objects;
2. Hydric adventitious roots;
3. Drift lines;
4. Rafted debris;
5. Aquatic mosses and liverworts;
6. Moss collars; and
7. Lichen lines.”

SECTION 3. TEMPORARY MORATORIUM IMPOSED.

(A) The Board of County Commissioners of Brevard County, Florida hereby imposes a temporary moratorium on the installation of OSTDS for new construction or renovation of existing structures, which are not capable of reducing the total nitrogen (TN) in effluent by 65% or greater for location on the barrier islands or within 50 meters of the Indian River Lagoon System Shoreline. A depiction of the temporary moratorium overlay area is provided in Exhibit A, attached hereto.

(B) In recognition of the reasoning and intent of the Board as set forth herein, the moratorium established in this section shall extend for period of 150 days from the effective date of this Ordinance.

SECTION 4. EXEMPTIONS.

This temporary moratorium shall not apply to:

(A) uninstalled OSTDS for which: (1) a permit was issued prior to May 22, 2018 or (2) a complete permit application was filed with all fees paid before May 22, 2018.

(B) repairs and maintenance to existing OSTDS.

SECTION 5. EXTENSIONS, EXPIRATION.

The Board may, by duly adopted ordinance, terminate the moratorium created by this Ordinance, or extend the moratorium for such additional period as the Board deems necessary to accomplish the purposes set out herein. If this Ordinance is so extended, the provisions of this Ordinance shall remain in effect for the duration of such extension. In the event the moratorium is not extended beyond the 150 day period established in this ordinance, the moratorium shall cease upon (1) the enactment of a permanent ordinance before expiration of the 150 day period; or (2) the expiration of that 150 day period with no further action by the Board of County Commissioners.

SECTION 6. CONFLICTING PROVISIONS

In the case of a direct conflict between any provision of this Ordinance and a portion or provision of any other applicable federal, state or county law, rule, code or regulation, the more restrictive shall apply, unless preempted by law.

SECTION 7. SEVERABILITY.

If any section, subsection, clause, phrase, word or provision of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such invalid unconstitutional portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions of this ordinance, provided the remaining portions effectuate purpose and intent of this ordinance.

SECTION 8. AREA ENCOMPASSED.

This Ordinance shall take effect COUNTYWIDE, within the municipal and unincorporated area of Brevard County, Florida, as depicted in Exhibit A, attached hereto.

SECTION 9. EFFECTIVE DATE.

This Ordinance shall take effect upon filing as provided by law
DONE, ORDERED AND ADOPTED in Regular Session, this ___ day of _____, 2018.

Attest:

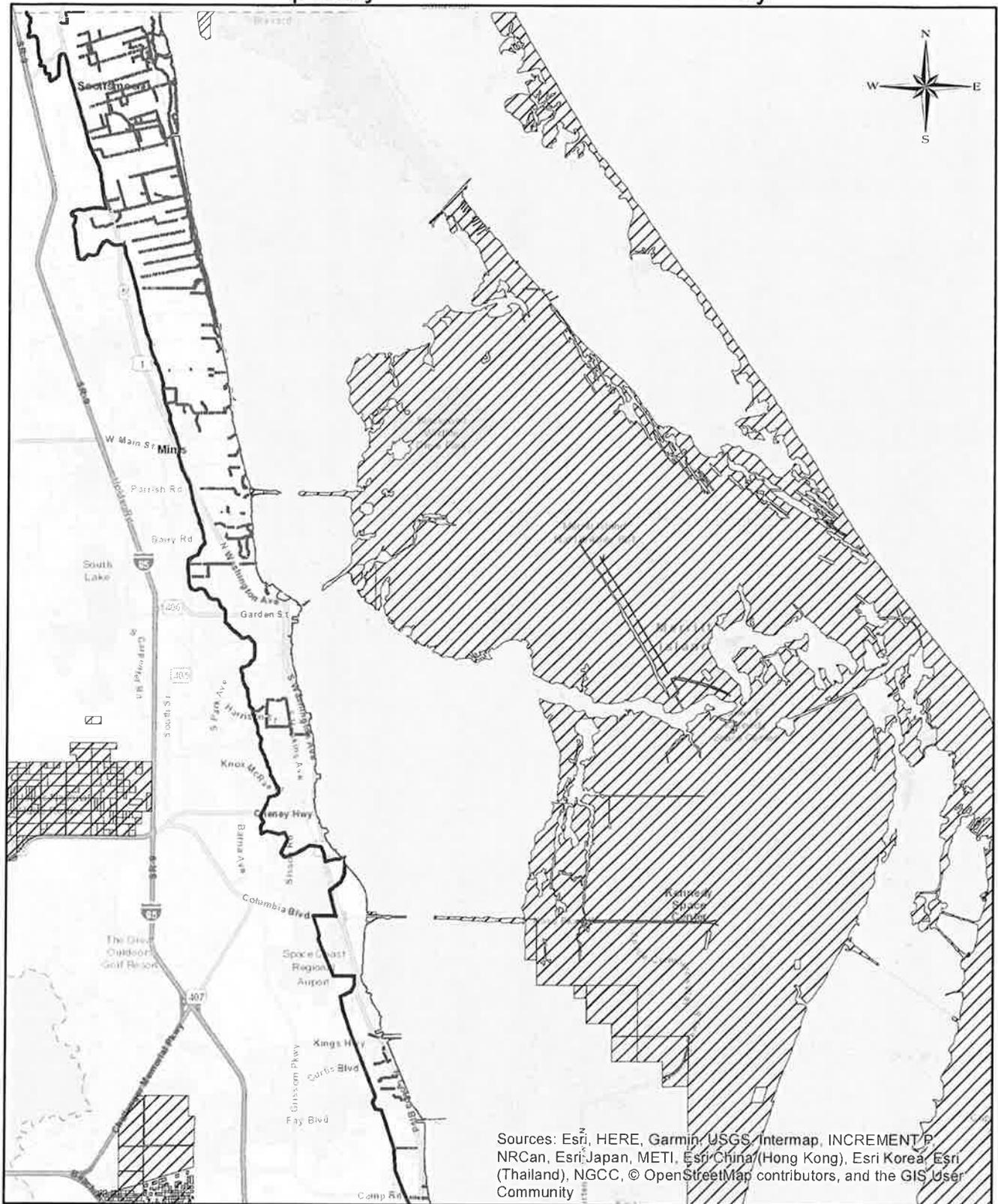
BOARD OF COUNTY COMMISSIONERS
OF BREVARD COUNTY, FLORIDA

Scott Ellis, Clerk

Rita Pritchett, Chair

(As approved by the Board on May____, 2018)

Exhibit A Temporary OSTDS Moratorium Overlay

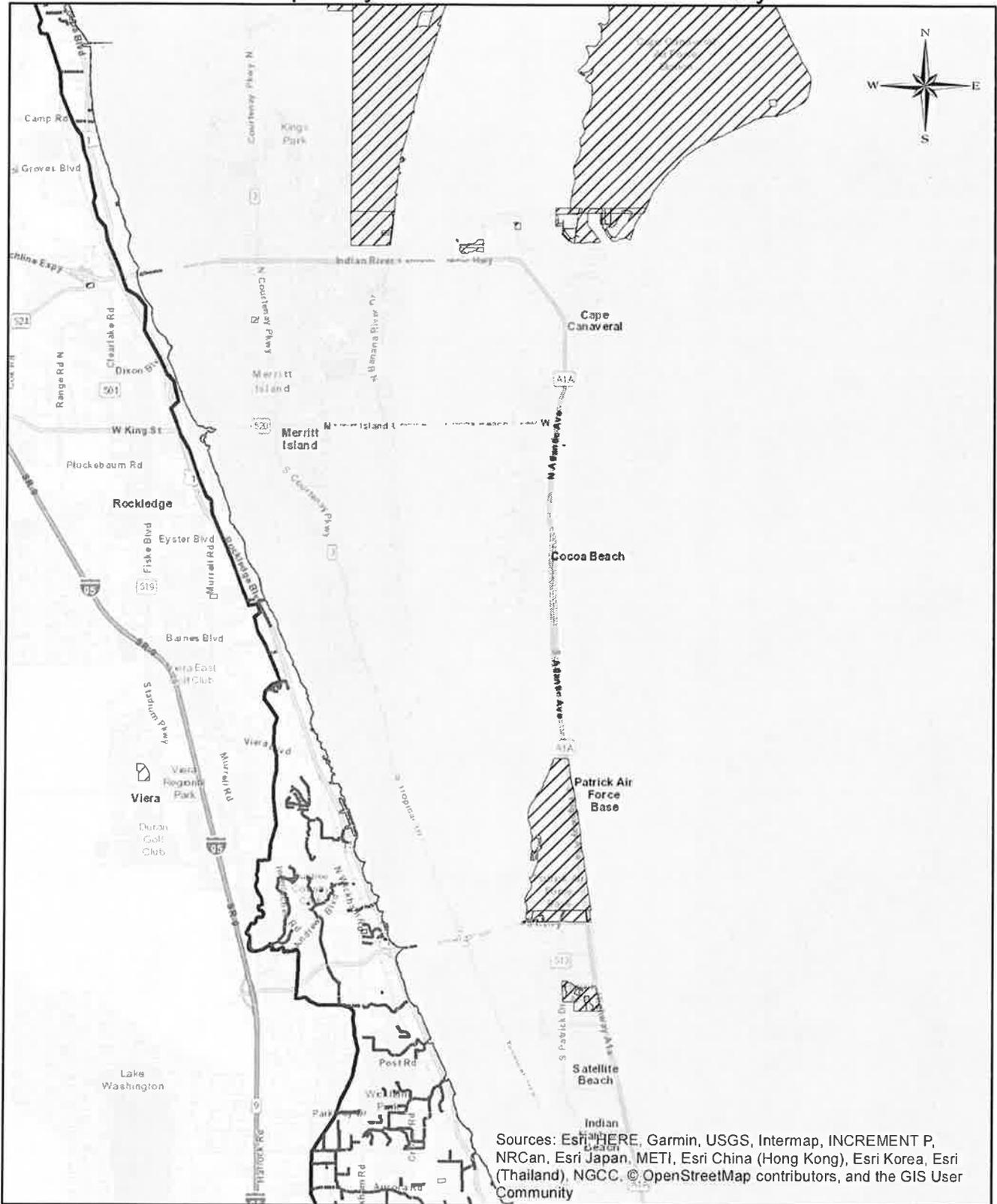


50m Overlay
 Barrier Islands Overlay
 Federal Lands
 Watershed Divide
 0 1 2 Miles

*Federally-owned lands excluded from the moratorium

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Exhibit A Temporary OSTDS Moratorium Overlay

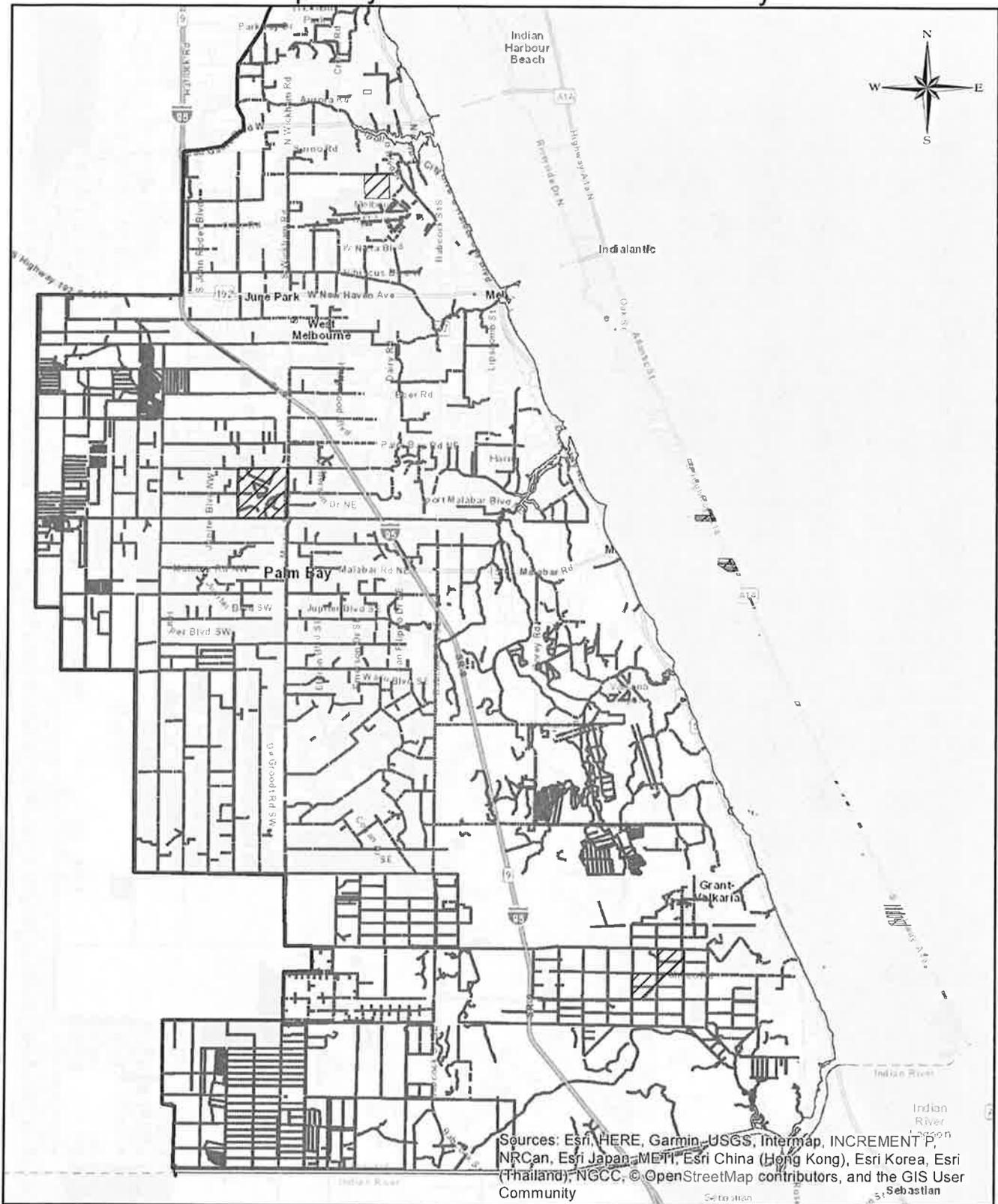


50m Overlay
 Barrier Islands Overlay
 Federal Lands
 Watershed Divide
 Miles

*Federally-owned lands excluded from the moratorium

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

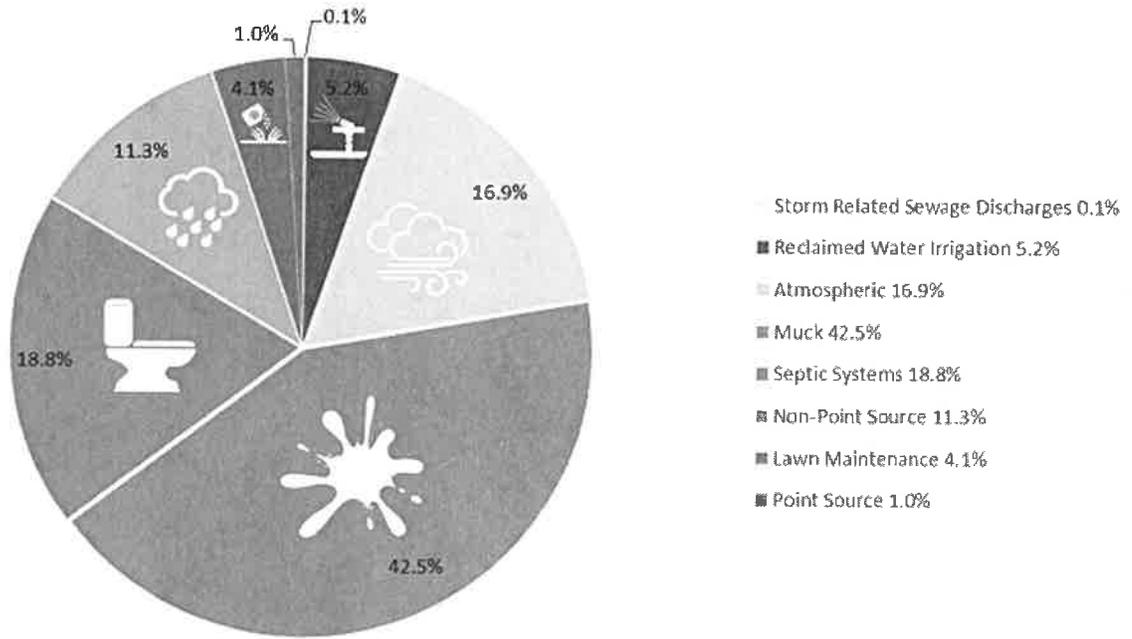
Exhibit A Temporary OSTDS Moratorium Overlay



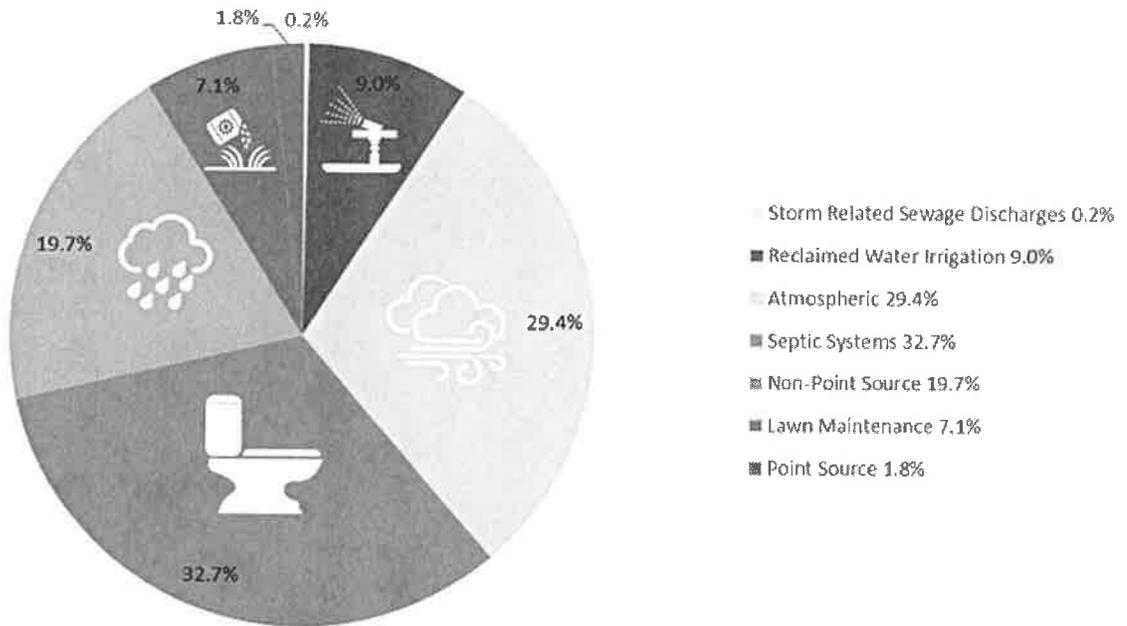
50m Overlay
 Barrier Islands Overlay
 Federal Lands
 Watershed Divide
 0 1 2 Miles

*Federally-owned lands excluded from the moratorium

Total Nitrogen Sources to the Indian River Lagoon



New Nitrogen Loading Sources to the Indian River Lagoon





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Septic Contracting
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Products

- Alternative Drainfield Products (_documents/alternative-20170821.pdf) (28 kb pdf)
- Composting Toilets (_documents/composting-toilets.pdf) (12 kb pdf)
- Incinerating Toilets - NSF Protocol P157 (<http://www.nsf.org/Certified/Protocols/Listings.asp?TradeName=&Standard=P157>)
- Fibers for Concrete Receptacles (_documents/fiber.pdf) (16 kb pdf)
- Pump Chamber Inserts / Filtered Pump Vaults (_documents/pump-vault.pdf) (17 kb pdf)
- Septic Tank Designs (<http://www10.doh.state.fl.us/pub/bos/Tanks/Tank-List.pdf>) (700 kb pdf)
- Septic Tanks Meeting HS20 Traffic Standards (_documents/traffic.pdf) (45 kb pdf)
- Septic Tank Outlet Filters (_documents/outlet-filters.pdf) (21 kb pdf)
- Septic Tank Seals and Sealants (_documents/seal.pdf) (19 kb pdf)

Advanced Systems (ATUs, Performance-Based, and Innovative Systems)

- Tanks Approved for use with Aerobic Treatment Units (ATUs) (_documents/atu.pdf) (115 kb pdf)
- Advanced Systems and Permitted Maintenance Entities By Product Name (ATU or PBTS) (_documents/advanced-systems-with-me.pdf) (35 kb pdf)
By County and Company Name (_documents/me-listing.pdf) (80 kb pdf)
- Performance-based treatment systems, including Innovative (_documents/pbts-components.pdf) (50 kb pdf)
This document contains performance data for CBOD5/TSS, TN, TP, and fecal coliform for various components of engineer-designed PBTS and Innovative systems.
- Certified Aerobic Treatment Units (ATUs) (_documents/certatu.pdf)

*Note: This page contains materials in the Portable Document Format (PDF). The free Adobe Reader

Contact the Statewide Headquarters of the Onsite Sewage Program

☎ 850-245-4250 (tel:850-245-4250)

✉ AskEH@flhealth.gov (mailto:AskEH@flhealth.gov)

☎ Fax 850-487-0864

➤ Mailing Address

Bureau of Environmental Health, Onsite Programs
4052 Bald Cypress Way, Bin A-08
Tallahassee, FL 32399-1710

If you have a question or concern about an issue that is located entirely within one county, versus statewide, please contact your Local County Health Department (.../programs-and-services/county-health-departments/find-a-county-health-department/index.html) directly for the most prompt response.

Average Testing Performance Data for Components of Performance-Based Treatment Systems (PBTs) by E. Roeder

- from innovative system testing in Florida or
- from test centers for evaluation of use in nutrient and fecal coliform-reducing PBTs or
- from test centers for NSF-certification as aerobic treatment units (ATUs)
- Innovative drainfield/disposal systems (Table 4)

For all performance-based treatment systems, the engineer will establish performance levels, and design the system as a whole to meet them. Approval of treatment receptacles is a separate matter and should be checked under the septic tank design approval listings http://www.floridahhealth.gov/environmental-health/onsite-sewage/products/_documents/septic-tanks.pdf.

Table 1 summarizes results of innovative systems testing under non-test-center conditions in Florida. The components listed in table 1 have undergone innovative system testing and been reviewed by the Bureau as indicated in the column "innovative status" for use in conjunction with engineer-designed performance-based treatment systems.

Table 2 summarizes test center testing results either associated with an NSF or ETV protocol or during the Big Pine Key study in Florida. These data have been used to evaluate treatment components that might be used as part of a nutrient-reducing or fecal coliform reducing performance-based treatment system designed by engineers. These are systems that are designed to reduce nitrogen and/or phosphorus to specified levels. The components listed in table 2 below have previously been reviewed by the Bureau as indicated in the column "innovative status". "yes" indicates that the components are currently in innovative status. Innovative status indicates that such approval has occurred in a limited fashion, providing for a limited number of permits and requiring additional testing.; "passed" indicates that components have completed innovative testing in Florida; "n/a" indicates that the use of previously approved ATUs in nutrient-reducing systems was accepted based on third-party testing data.

Table 3 summarizes test center testing results where the objective was usually to achieve certification by NSF under standard NSF-40 (waste strength reduction). The components listed in table 3 below are treatment systems approved in Florida as ATUs under 64E6.012, Florida Administrative Code, except for the last few as noted. Currently, the Department is accepting such data as a form of documentation of the "application of sound engineering principles" by engineers designing performance-based treatment systems with the only goal of reducing waste strength (CBOD5, TSS) in order to qualify for drainfield size reductions under 64E-6.028(5), Florida Administrative Code.

Table 4 lists additional innovative systems that are evaluated as drainfield/disposal systems. Table 5 additional innovative systems.

Table 1. Results of Innovative System Testing in Florida

Component/ Configuration	Type of testing	CBOD5 (mg/L)		TSS (mg/L)		TN (mg/L)		TP (mg/L)		Vendor	Vendor Contact Phone	Vendor web-site	Innovative Status
		In	Out	In	Our	In	Out	In	Out				
EcoPure 300	Innovative in Florida (n=25/9 of 1 system)	327	7.7	421	6.2	58	31	11	5.1	Eco-Pure Waste- water Systems Earthtek Environmental Systems	888-999- 0936	www.eco- purewastewatersystems.com	Passed
EnviroFilter C	Innovative in Florida (n=26/24 of 5 systems)		7.6		5.3		21.7		5.8	Biotech Systems LLC	352-376- 8016	www.biofilter.com	Passed
ZeroImpact	Innovative in Florida (n=33/29 of 5 systems)		10.49		3		23		1.4				Yes

Disclaimer: This list does not represent or imply an endorsement of any particular company, person, product, configuration or technology. The list reflects the compiler's information as of February 12, 2018. The field of advanced treatment for onsite systems is changing continuously.

Table 2. Test Center Testing Results, which have been used in evaluating components proposed for nutrient- and fecal coliform reducing performance-based treatment systems.

Equipment Series	Equipment	Type of test	in TN (mg/L)	out TN (mg/L)	TN removal (%)	in TP (mg/L)	out TP (mg/L)	in fecal coliforms (CFU/100mL)	out fecal coliforms (CFU/100mL)	Vendor	Innovative Status
Advantex	Advantex 20x Mode 1	N-testing concurrently with NSF-40, Squamish, B.C.	33	12	64%	-	-	-	-	Oreco Systems	Yes
	Advantex 20x Mode 3	N-testing after NSF-40, Squamish, B.C.	35	12	66%	-	-	-	-	Oreco Systems	Yes
Aerocell	Aerocell ATS SCAT-8-AC-C500	NSF+Nitrogen, Waco	40	9.3	77%	-	-	-	-	Quanics Ecological Tanks, Inc.	Yes
Aqua Safe	Aqua Safe 500	-31 N-tests during NSF-40 test	30.78	14.9	52%	8.21	5.87	-	2200 median	Clearstream Waste-Water Systems, Inc.	Yes
Clearstream	Clearstream 500 D	NSF 245 Prairieville, LA	42	19	53%	-	-	-	-	Clearstream Waste-Water Systems, Inc.	Yes
CE	Fuji Clean CE 5	NSF-40+Nitrogen, Waco	47.6	15.7	67%	-	-	-	-	Fuji Clean USA, LLC	Yes
CEN	Fuji Clean CEN 5	NSF 245 (for TN), testing concurrent with NSF40 (for fecal coliform)	40	10.4	74%	-	-	2.0E+6 to 1.2E+9 (30-day geomean)	2.7E+4 to 6.3E+5 (30-day geomean)	Fuji Clean USA, LLC	Yes
CEN +Salcor 3G	Fuji Clean CEN 5 + Salcor 3G	testing concurrent with NSF40 (for fecal coliform)	-	-	-	-	-	2.7E+4 to 6.3E+5 (30-day geomean)	70 geomean (6 to 183 30-day geomean)	Fuji Clean USA, LLC	Yes
EcoPure	EcoPure 300	25 (9 for N) samples, one installation Lee County	56.13	31.16	44%	11.12	5.11	101586	80.6	Eco-Pure Wastewater Systems	n/a
Enviro-Guard	Enviro-Guard 0.75	NSF+Nitrogen with reduced sampling	46	20	57%	-	-	-	-	Consolidated Treatment Systems	n/a
	MicroFAST 0.5	Keys Study, Phase I (12 samples)	38.45	10.97	71%	8.39	5.38	-	-	Consolidated Treatment Systems	n/a
MicroFAST	MicroFAST 0.5	Keys Study, Phase II (13- 14 samples)	47.98	11.51	76%	8.72	6.62	144,500 (mean log)	269 (mean log); 1,510 max	Bio-Microbics	n/a
	FAST	NSF40+Nitrogen	34.5	9.4	73%	-	-	-	-	Bio-Microbics	n/a
HOOT	HOOT H-500 AND	N-testing (25 samples) concurrent with NSF-40	26.3	9.63	63%	8.8	3.12	-	-	Hoort Aerobic Systems	n/a
Hydro-Kinetic	Hydro-Kinetic 600									Norweco, Inc.	Yes
Hydro-Kinetic+UV	Hydro-Kinetic 600 FEU w/ AT-1500 UV	NSF245	36	8.7	76%	-	-	1.5E+6	2.5E+4	Norweco, Inc.	Yes
Nitrex	Nitrex (after LAI-specified pretreatment)	Within 12 months of NSF-40	-	-	-	-	-	-	-	Lombardo Associates, Inc.	Yes
		NSF-load, MASSTC 10/2001-03/2004	19.3	5.4	72%	-	-	-	-	Lombardo Associates, Inc.	Yes
		NSF-load, MASSTC 12/2004-10/2005	22.6	7.1	69%	-	-	-	-	Lombardo Associates, Inc.	Yes

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2. cont'd Test Center Testing Results, which have been used in evaluating components proposed for nutrient- and fecal coliform reducing performance-based treatment systems.

Equipment Series	Equipment	Type of test	in TN (mg/L)	out TN (mg/L)	TN removal (%)	in TP (mg/L)	out TP (mg/L)	in fecal coliforms (CFU/100mL)	out fecal coliforms (CFU/100mL)	Vendor	Innovative Status
Singular	Singular 960 w/ Biokinetics phase 1 w/ recirc	16 N-tests at NSF-testing facility (Chelsea, MI)	25	6.8	73%	-	-	-	-	Norweco, Inc.	n/a
	Singular 960 w/ Biokinetics phase 2 no recirc	8 N-tests at NSF-testing facility (Chelsea, MI)	25	11.8	53%	-	-	-	-		n/a
Puraflo P150N w/ added carbon addition and UV-disinfection	Puraflo P150N*3B	concurrent w/NSF40	-	-	-	6.8	5.3	6.99E+06 geomean	3.01E+3 geomean	Anua	Yes
	Puraflo P150N*3B (single pass-through)	NSF 40 +Nitrogen Waco weekly and biweekly sampling under normal NSF-load, MASSTC	38.3	5.2	86%	-	-	-	-		
	added anoxic carbon addition Micro C-G	NSF-load MASSTC	18.9	6.3	additional 67%	-	-	13.529 geomean	25.1 geomean		
Septitech	Septitech Model 400	ETV (MA)	39	14	64%	-	-	-	-	Septitech	Yes
-	24" unsaturated crushed brick ~1 gpd/sqft	Keys Study, Phase I (11 samples)	-	-	-	6.04	0.60	-	-	-	n/a
-	24" unsaturated crushed brick ~1.7 gpd/sqft	Keys Study, Phase II (n=13/4)	-	-	-	8.72	2.65	-	-	-	n/a
-	24" unsaturated IECA ~1 gpd/sqft	Keys Study, Phase I (11 samples)	-	-	-	6.04	1.31	-	-	-	n/a
-	24" unsaturated filterite ~1.7 gpd/sqft	Keys Study, Phase II (n=13/10)	-	-	-	8.72	0.53	-	-	-	n/a

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Table 3. Test Center Testing Results, which have been used in evaluating components proposed for performance-based treatment systems designed for drainfield size reductions.

Equipment Series	Model tested	in BOD5 (mg/L)	out CBOD5 (mg/L)	in TSS (mg/L)	out TSS (mg/L)	Manufacturer
Advanced Enviro-Septic (innovative as disposal system)	Simple Septic (used to certify Advanced Enviro-Septic)	180	11	210	7	Presby Environmental, Inc.
Advantex	AX20N Mode 1	162	5	291	4	Oreco Systems
Aerocell	ATS SCAT-8-AC-C500	240	2	290	2	Quanics
Aero-Tech	AT-500	230	5	210	6	Aero-Tech
Alliance	500	137	6	140	15	Acquired Wastewater Technologies, LLC
Agua Aire	500	170	2.7	184	3.9	Ecological Tanks, Inc.
Agua Safe	500	170	2.4	183	2.1	Ecological Tanks, Inc.
AquaKlear	AK6PT	200	8	180	9	AquaKlear, Inc.
AquaKlear	AK500C	150	10	130	11	AquaKlear, Inc.
B.E.S.T. 1 AWS 1	500	130	21	139	21	American Wastewater Systems, Inc.
BioBarrier	MBR-0.5	220	<2	220	<2	Bio-Microbics
Bio-Coir	ATS-SCAT-8-BC-C500	160	9	190	12	Quanics
Bionest	BN-400	210	2	240	2	Bionest Technologies
Cajun Aire Advanced	500	170	13	60	19	Acquired Wastewater Technologies, LLC
Cajun Aire Basic	500	189	9.5	214	10.2	Acquired Wastewater Technologies, LLC
Clearstream	500 N	171	6	222	9	Clearstream Wastewater Systems, Inc.
Delta DF	DF40-M	173	6	189	7	Delta Environmental Products, Inc.
Delta UC	UC50	181	6	159	8	Delta Environmental Products, Inc.
ECOPOD-N	E50-N	210	9	170	8	Delta Environmental Products, Inc.
Ecoflo Biofilter	STB-500	140	2	170	2	Premier Tech Environment
Enviro-Guard	0.75	220	5	220	5	Consolidated Treatment Systems
Fuji Clean CEN	CEN 5	190	5	300	6	Fuji Clean USA
Fuji Clean CE	CE 5	150	11	260	13	Fuji Clean USA
HOOT	H-500 A	196.1	2.3	194.3	1.8	Hoort Aerobic Systems
HOOT	H-600 A	110	<5	107	3	Hoort Aerobic Systems
Hydro-Action	AP500	177	9	201	15	Hydro-Action Industries
Hydro-Kinetic	600 FEU	190	2	150	2	Norweco, Inc.
Jet	J-500 (Model J-353)	172	15	194	12	Jet Inc.

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Table 3. cont'd. Test Center Testing Results, which have been used in evaluating components proposed for performance-based treatment systems designed for drainfield size reductions.

Equipment Series	Model tested	in CBOD5 (mg/L)	out CBOD5 (mg/L)	in TSS (mg/L)	out TSS (mg/L)	Manufacturer
MicroFAST	0.5	250	3	310	1.4	Bio-Microbics, Inc.
Multi-Flo	FTB-0.5	170	5	195	5	Consolidated Treatment Systems
Nayadic	M-6A	150	6	184	7	Consolidated Treatment Systems
Puraflo P150N	Puraflo P150N*3B	240	2	260	2	Anna
Singular-960	500 w/ Biokinetics	184	6	238	10	Norweco, Inc.
Singular-TNT	500	240	4	260	9	Norweco, Inc.
b) Treatment systems that are not ATUs per 64E-6.012, Florida Administrative Code (generally, innovative systems)						
Advantex	AX20N Mode 3	139	10	173	18	Oranco Systems
Nitrex	Nitrex (after pretreatment) (note: for systems designed to meet 10/10 standard, innovative permit requires polishing filter)	6	26	5	5	Lombardo Associates, Inc.
Septitech	Model 400	250 (BOD5)	5.4	150	3	Septitech

Notes: Influent and effluent concentrations are averages unless otherwise noted.

Table 4. Innovative Systems that are evaluated as drainfield/disposal systems (Requires forms DH 3144 and 3145 to be filed and coordination with State Health Office)

Manufacturer	Equipment Series
NoMound Onsite Systems	NoMound
Presby Environmental Inc.	Advanced Enviro-Septic (AES)

Table 5. Other Innovative Systems (Requires forms DH 3144 and 3145 to be filed and coordination with State Health Office)

Manufacturer	Equipment Series
Environmental Conservation Solutions	Passive Onsite Treatment System (POTS)

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64E-6.012, F. A. C. - Aerobic Treatment Units

Manufacturer	Equipment Series	Model Tested
Treatment Systems Approved as ATUs in Florida that are ALSO NSF245-certified by either NSF or Gulf Coast Testing LLC		
Bio-Microbics, Inc.	MicroFast	0.5
Bio-Microbics, Inc.	BioBarrier	MBR 0.5-N
Delta Environmental Products, Inc.	ECOPOD-N	E50-N
Fuji Clean USA	Fuji Clean CEN	CEN 5
Norweco, Inc.	Singulair TNT	Singulair TNT
Norweco, Inc.	Hydro-Kinetic	600 FEU
Orengo Systems	Advantex	AX20N

PBTS currently in use, listed as capable of removing \geq 50% nitrogen, prior to disposing into drainfield with a 24" separation to water table, to meet the BMAP target of 65% nitrogen reduction.