Clean Waterways Act Requirements for Wastewater & Onsite Sewage Disposal Systems Plans

Submitted by:
Volusia County Environmental Management
Volusia County Water Resources & Utilities
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Introduction

Volusia County is in northeast Central Florida, bordered on the west by the St. Johns River and Lake Monroe, and by the Atlantic Ocean to the east. According to the U.S. Census Bureau, it is currently the 12th largest county in Florida, based on a population of 553,543 in 2020 and estimated population of 579,192 in 2022. Volusia County has a total area of 1,432 square miles, of which 1,101 square miles are land and 331 square miles (23.1%) are covered by water.

The west Volusia area is home to three (3) of the state's thirty (30) Outstanding Florida Springs (OFS), as designated by the Florida Springs and Aquifer Protection Act of 2016. They are Volusia Blue Spring, DeLeon Spring, and Gemini Springs. As a designated OFS, each spring requires additional protections to ensure their conservation and restoration for future generations. Through the DEP's ongoing assessment efforts, each spring has been determined to have excess levels of nitrogen, requiring Basin Management Action Plans (BMAPs) to improve groundwater quality.

In east Volusia, the Mosquito Lagoon encompasses a distinct section of the larger Indian River Lagoon (IRL) system. The waterway is approximately 36 miles long and stretches across north Brevard County up to Ponce de Leon Inlet in Volusia County. In September 2019, the Mosquito Lagoon Reasonable Assurance Plan (RAP) was adopted by DEP secretarial order to improve water quality through the implementation of a variety of restoration activities and projects developed through the cooperative efforts of state and local governments in southeast Volusia. In addition to the RAP, an updated North Indian River Lagoon Basin Management Action Plan (BMAP) was later adopted by DEP secretarial order in February 2021 to promote further water quality protection.

In accordance with Florida Statutes 403.067(7)(a)9, local governments within a nutrient BMAP must develop a wastewater treatment plan and/or an onsite sewage treatment & disposal system (OSTDS) remediation plan containing certain information, if the Department "identifies domestic wastewater treatment facilities or OSTDS as contributors of at least 20 percent of point source or nonpoint source nutrient pollution or if the Department determines remediation is necessary to achieve the total maximum daily load (TMDL). For Volusia County, this requirement applies to the following (6) Nutrient BMAPs:

- *Volusia Blue Spring*
- *DeLeon Spring*
- *Gemini Springs*
- *Lower St. Johns River Mainstem*
- *Lake Harney, Lake Monroe, Middle St. Johns River, and Smith Canal*
- *North Indian River Lagoon*

This compliance plan consists of two parts: a wastewater treatment plan and an OSTDS remediation plan.

Section 1. Wastewater Treatment Plans (Overview)

Within Volusia County, a total of fifteen (15) public utilities provide centralized wastewater service. Of these providers, twelve (12) operate wastewater treatment facilities (WWTFs). Typically, cities of smaller populations may elect to use a larger wholesale provider due to greater efficiency and overall cost-effectiveness.

The Volusia County Water Resources & Utilities (VCWRU) division is a full-service utility operator providing potable water, wastewater, and reclaimed service in six (6) mostly rural service areas throughout the county. In terms of retail and wholesale wastewater treatment, VCWRU serves an estimated population of approximately 35,200 or 6.5% of the entire county. The remaining population is served by a combination of public utilities, private wastewater package plants, and individual OSTDS.

VCWRU operates three (3) wastewater treatment facilities and associated sanitary sewer collections systems within the following Nutrient BMAPs

- *Volusia Blue Spring*
- *Gemini Springs*
- *Lower St. Johns River Mainstem*
- *Lake Harney, Lake Monroe, Middle St. Johns River, and Smith Canal*
- *North Indian River Lagoon*

It is important to point out that more than one public utility system operates within each of the above stated BMAPs.

Therefore, as the population continues to increase and the demand for advanced wastewater treatment service rises, widescale septic-to-sewer conversion efforts must be regarded as a collaborative regional effort and shared responsibility among local municipalities, new development, private package plant operators, OSTDS owners, and state agencies.

Southwest Volusia Area Wastewater Treatment Plan Background

In southwest Volusia, the VCWRU division currently operates two (2) interconnected WWTFs which provide regional wastewater treatment and reclaimed water service for portions of four (4) cities:

i) VC Southwest Regional WWTF-1 is classified as a 2.70 MGD AADF "Advanced Wastewater Treatment plus Filtration Facility" (Category I, Class B), utilizing the 5-Stage Biological Nutrient Removal (BNR) process and meets all Class I reliability criteria. The facility is in DeBary and permitted under FDEP Operations Permit No. FLA011128.

ii) VC Southwest #2 WRF is classified as a Category III, Class C operates as a modified activated sludge domestic wastewater treatment facility. It has an existing permitted plant capacity of 0.60 MGD. It does not currently meet advanced wastewater treatment standards. Located in Deltona, the facility is permitted under FDEP Operations Permit No. FLA011121.

VCWRU's wastewater strategic plan involving these two facilities has served as the foundation for successful water quality and alternative water (reclaimed) supply projects, necessary to protect Volusia Blue and Gemini Springs springsheds.

At the time in which the Florida Springs and Aquifer Protection Act of 2016 was enacted, none of VCWRU's three (3) treatment facilities met advanced wastewater treatment (AWT) requirements for an Outstanding Florida Spring (OFS).

In immediate response to the more stringent standards, VCWRU completed AWT upgrades at VC Southwest Regional WWTF-1 in 2018. The upgrade included a 1.0 MGD plant capacity expansion which allowed for the decommissioning of a 0.3 MGD non-AWT treatment facility in Orange City. The dual benefit strategy resulted in reductions of total nitrogen (27,000 lbs/yr) and total phosphorus (12,000 lbs/yr) while increasing reclaimed water supply by over 220,000 per day.

Additional wastewater collection system extensions and lift station upgrades completed between 2019 – 2022 have enabled the interconnection of the two remaining treatment facilities in DeBary and Deltona.

Southwest Volusia Wastewater Treatment Plan – Required Elements

The following information is provided to satisfy each required element of this compliance plan.

1. **The facility's permitted capacity in average annual gallons per day.**
   Currently, VC Southwest Regional WWTF-1 has a permitted capacity of 2.70 MGD and VC Southwest #2 WRF has a permitted capacity of 0.60 MGD, providing a combined permitted treatment and disposal capacity of 3.30 MGD. In 2023, the average annual daily flow was 2.04 MG and 0.17 MG, respectively.

2. **The facility's permitted TN and TP effluent limits for the facility.**
   VC Southwest Regional WWTF-1 is an advanced wastewater treatment facility with effluent goals of 3 mg/L-TN and 1 mg/L-TP.
   VC Southwest #2 WRF: permitted TN/TP limits 0.600 MG to RIBS; TN=10 mg/L Annual and 20 mg/L Single Sample

3. **The annual TN and TP loads (showing both flow and concentrations) discharged from the facility over the past five years, estimated if necessary.**
   The five-year history of Annual Total Nitrogen (TN) and Total Phosphorus (TP) loads for VC Southwest Regional WWTF-1 and VC Southwest #2 WRF is provided in an attachment **Appendix-A** to this submittal.

4. **A capacity analysis for the facility, considering future growth over the next 20 years.**
   The most recent capacity analysis reports for VC Southwest Regional WWTF-1 and VC Southwest #2 WRF are provided in attachment **Appendix-B** to this submittal.

5. **A list and ranking of facility construction, expansion, or upgrades necessary to meet applicable nutrient water quality requirements (for example, to meet nutrient effluent limits in BMAPs and TMDLs, section 403.064(17), Florida Statutes, requirements, or other statutory or regulatory requirements), and the estimated costs of these facility improvements.**

   i) Expansion of VC Southwest Regional WWTF-1 – necessary to support regional OSTDS remediation plans required by the Florida Springs & Aquifer Protection Act for Volusia Blue and Gemini Springs. Estimated construction cost $77,100,000. The key project components include:
      - expanded treatment capacity from 2.7 to 4.5 MGD
      - increased reclaimed water storage from 4.5 to 9.5 MG
      - replace biosolids treatment facilities

   ii) Expansion of VC Southwest #2 WRF from 0.6 MGD to 2.0 MGD – necessary to enhance current treatment to advanced wastewater treatment standards and support regional OSTDS remediation plans as required by the Florida Springs and Aquifer Protection Act for Volusia Blue Spring. Estimated construction cost $38,200,000 (in current year 2024 dollars).

   iii) There are currently no regulatory requirements mandating that utilities treat their sludge to Class "A" standards. The County's preference is to move towards a Class "A" biosolids treatment process along with the integration of a biosolids solar dryer in anticipation of the potential regulatory requirements associated with land application of biosolids and to significantly reduce the volume and mass of treated biosolids disposal. Estimated cost $18,150,000 (in today's dollars).

6. **A projected timeline of the dates by which the construction of any facility improvements, including new/extended sewer lines, will begin and be completed and the date by which operations of the improved facility will begin.**

   i) Expansion of Southwest Regional WWTF-1 from 2.7 MGD to 4.5 MGD. Estimated date of completion December 2026 (in progress). Upon completion of the expansion project, VC Southwest #2 WRF will be taken offline, enabling 100% of influent flow treated to AWT standards at Southwest Regional WWTF-1. Funded in part through DEP Grant Number WG036.

   ii) Master planning for OSTDS remediation and Phase 1 design of sanitary sewer infrastructure benefiting Gemini Springs water quality. Estimated year of completion 2027 (in progress). Funded in part through DEP Grant Number LPA0699

iii) Construction of Phase 1 OSTDS retrofit to a sanitary sewer system to benefit Gemini Springs water quality. Estimated year of completion 2029 (pending future funding opportunities).

iv) Design and expansion of VC Southwest #2 WRF from 0.6 MGD to 2.0 MGD and conversion to advanced wastewater treatment. Design is expected to be initiated in 2027. Actual construction will be based on the progress of OSTDS remediation initiatives and future demand resulting from population growth. The estimated year of completion is forecasted to be 2035. (pending future funding opportunities).

v) There are currently no regulatory requirements mandating that utilities treat their sludge to Class "A" standards. The County's preference is to move towards a Class "A" biosolids treatment process along with the integration of a biosolids solar dryer in anticipation of the potential regulatory requirements associated with land application of biosolids and to significantly reduce the volume and mass of treated biosolids disposal. The goal to complete is within 5 years, pending future opportunities.

Southeast Volusia Area Wastewater Plan Background

In southeast Volusia, the VCWRU division currently operates VC Southeast WWTF-7 which provides wastewater treatment for portions of Edgewater and Oak Hill. It is classified as a 0.60 MGD secondary wastewater treatment plus filtration facility (Category III, Class C) Located in Oak Hill, the facility is permitted under FDEP Operations Permit No. FLA017413.

In February 2021, the DEP adopted the updated North IRL Basin Management Action Plan (BMAP) which set more stringent nutrient limits for VC Southeast WWTF-7. For consistency of operations, VCWRU has chosen a 5-Stage biological nutrient removal (BNR) process to meet AWT criteria, providing Class I reliability, and mirroring processes already at other county reclamation facilities.

Southeast Volusia Wastewater Treatment Plan - Required Elements

The following information is provided to satisfy each required element of this compliance plan.

1. **The facility's permitted capacity in average annual gallons per day.**
   Currently, VC Southeast WWTF-7 has a rated capacity of 0.60 MGD and permitted capacity of 0.520 MGD. In 2023, the average annual daily flow was 0.255 MG.

2. **The facility's permitted TN and TP effluent limits for the facility.**
   Permitted annual average TN = 10.0mg/L and TP = 6.0mg/L

3. **The annual TN and TP loads (showing both flow and concentrations) discharged from the facility over the past five years, estimated if necessary.**
   The five-year history of Annual Total Nitrogen (TN) and Total Phosphorus (TP) loads for VC Southeast WWTF-7 is provided in attachment **Appendix-A** to this submittal.

4. **A capacity analysis for the facility, considering future growth over the next 20 years.** The most recent capacity analysis report for VC Southeast WWTF-7 is provided in attachment **Appendix-B** to this submittal.

5. **A list and ranking of facility construction, expansion, or upgrades necessary to meet applicable nutrient water quality requirements (for example, to meet nutrient effluent limits in BMAPs and TMDLs, section 403.064(17), Florida Statutes, requirements, or other statutory or regulatory requirements), and the estimated costs of these facility improvements.**

   i) Expansion of VC Southeast WWTF from 0.6 MGD to 1.2 MGD – necessary to improve treatment to advanced wastewater treatment standards and implement OSTDS remediation plans required by the North Indian River Lagoon BMAP. Estimated construction cost $26,125,000.
   ii) Extension of sanitary sewer collection system providing availability for RV park and fish camp businesses located along the Mosquito Lagoon shoreline. Costs currently under evaluation.

6. **A projected timeline of the dates by which the construction of any facility improvements, including new/extended sewer lines, will begin and be completed and the date by which operations of the improved facility will begin.**

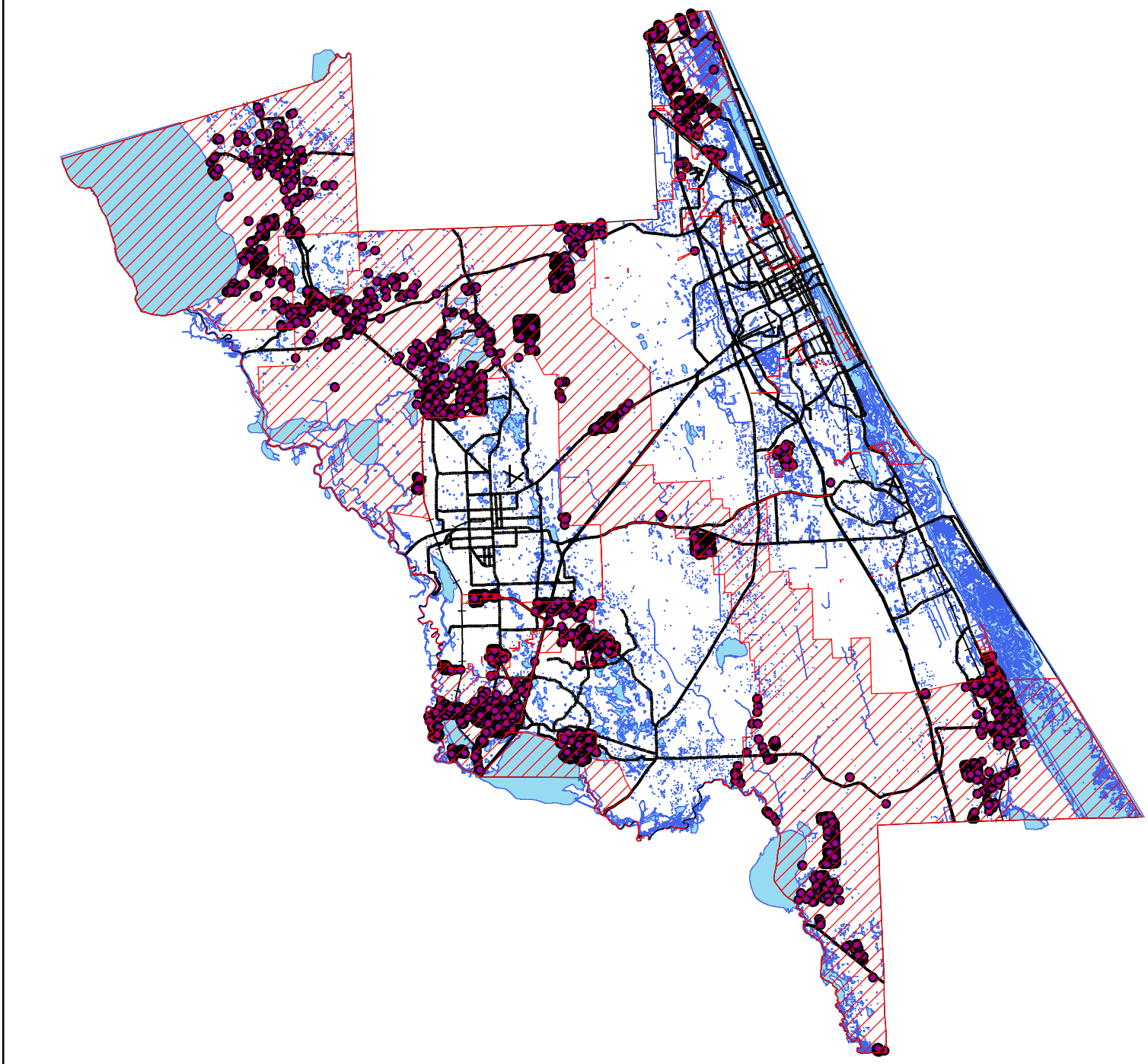
   i) AWT and expansion of VC Southeast WWTF- from 0.6 MGD to 1.2 MGD. Estimated date of completion is December 2026. (in progress). Funded in part through DEP Grant Number WG002.
   ii) Extension of sanitary sewer collection system providing availability for RV park and fish camp businesses located along the Mosquito Lagoon shoreline. Timeline is to be determined.

Section 2. Onsite Sewage Treatment and Disposal System (OSTDS) Remediation Plans

1. An inventory of the OSTDS within the local government's jurisdiction or service area.
   The Volusia County combined utility service areas represent a small portion of the entire county, and primarily serves customers within a municipal boundary (DeBary, Orange City, Oak Hill). In addition, many of the areas in unincorporated Volusia County are within the utility service area of a municipal utility. To determine the number of OSTDS that Volusia County is responsible for, staff created a geographic area that represents: 1. the Volusia County utility service area, including within city boundaries, and 2. the unincorporated areas of Volusia County that are not within a municipal service area. OSTDS locations within this geographic boundary were obtained using the Department of Health FLWMI Well Septic 2018 Geodatabase identifying parcels that are known septic or likely septic and that fall on parcels that the Volusia County Property Appraiser identifies as having residential bathrooms. The enclosed shapefile entitled "Question1" represents the best information available to inventory the existing OSTDS within Volusia County's jurisdiction, consisting of a total of **12,683** OSTDS. Refer to **Appendix C** for Question 1 Shapefiles.

2. An estimate of future growth in new OSTDS over the next 20 years in the local government's jurisdiction or service area.
   Several assumptions were required to estimate this number. Using the geographic area indicated above, staff identified the number of existing vacant residential parcels with entitlements for a residential dwelling. Any known areas where development is unlikely were removed from the database. This number represents the theoretical maximum number of new OSTDS (although not necessarily conventional OSTDS) in the geographic area for which the county is responsible for wastewater. This assumes that any changes in density (such as through land use amendments) would require provision of municipal wastewater services. The enclosed shapefile entitled "Question2" represents the best information available to estimate the number of new OSTDS within Volusia County's jurisdiction over the next 20 years, consisting of a total of **6,617** OSTDS. Refer to **Appendix C** for Question 2 Shapefiles. Refer to **Figure 1** for a map of the estimated number of future OSTDS within Volusia County jurisdiction.

Figure 1. Future OSTDS within Volusia County's Jurisdictional Area



3. An inventory of OSTDS that is expected to be eliminated over the next 20 years through connection to central sewer lines of a domestic wastewater facility or other distributed wastewater system.
   Volusia County Water Resources is evaluation options for septic to sewer projects planned in the next 20 years including the Indian Harbor Estates retrofit project in the VC Southeast WWTF-7 Service Area as well as the Gemini Springs OSTDS retrofit project in the VC Southwest Regional WWTF-1 Service Area. The enclosed shapefile entitled "Question3" represents the best information available to estimate the number of OSTDS within Volusia County's jurisdiction that will be eliminated over the next 20 years, consisting of a total of **2,580** OSTDS. Refer to **Appendix C** for Question 3 Shapefiles.

4. Identification of deadlines and milestones for the extension of sewer lines.
   i. Master planning for the remediation of approximately 2,300 OSTDS's and Phase 1 design for the retrofit of approximately 700 OSTDS to centralized sewer for the benefit of Gemini Springs water quality. Estimated year of completion 2027 (in progress).
   ii. Construction of Phase 1 OSTDS retrofit to a sanitary sewer system to benefit Gemini Springs water quality. Estimated year of completion 2029 (pending funding).

5. The estimated costs associated with (4) above.
   i. Master planning for OSTDS remediation and Phase 1 design of sanitary sewer infrastructure benefiting Gemini Springs water quality. Estimated cost $2,800,000.
   ii. Construction of Phase 1 OSTDS retrofit to a sanitary sewer system to benefit Gemini Springs water quality. Estimated cost $20,000,000 (based on 2021 estimate). Refer to **Appendix D** for the Gemini Springs Feasibility Analysis Report.

6. The number of remaining OSTDS that will be required to be eliminated to meet water quality objectives of the BMAP.
   To estimate the number of remaining traditional OSTDS in the jurisdiction of Volusia County, staff removed the systems identified in (3) above from the total inventory of OSTDS identified in (1). We assumed that any new systems identified in (2) that fall within any BMAP will be nutrient reducing systems as required by HB 1379, so are not included in the number that need to covert. In addition, any existing OSTDS within the Priority Focus Area (PFA) of the three Outstanding Florida Springs, or within the Mosquito Lagoon Reasonable Assurance Plan (MLRAP) are required to upgrade to nutrient reducing systems in the next 20 years per the BMAP and HB 1379 and were therefore not included in the number of conventional OSTDS that could be upgraded. Our calculation of remaining systems is summarized as follows:

   Remaining traditional OSTDS in Volusia County jurisdiction =
   number of existing systems from #1, plus
   number of new systems from #2, minus
   number of systems from #2 that are within a BMAP, minus
   number of systems converted to sewer from #3, minus

number of systems in springs PFAs and ML RAP.

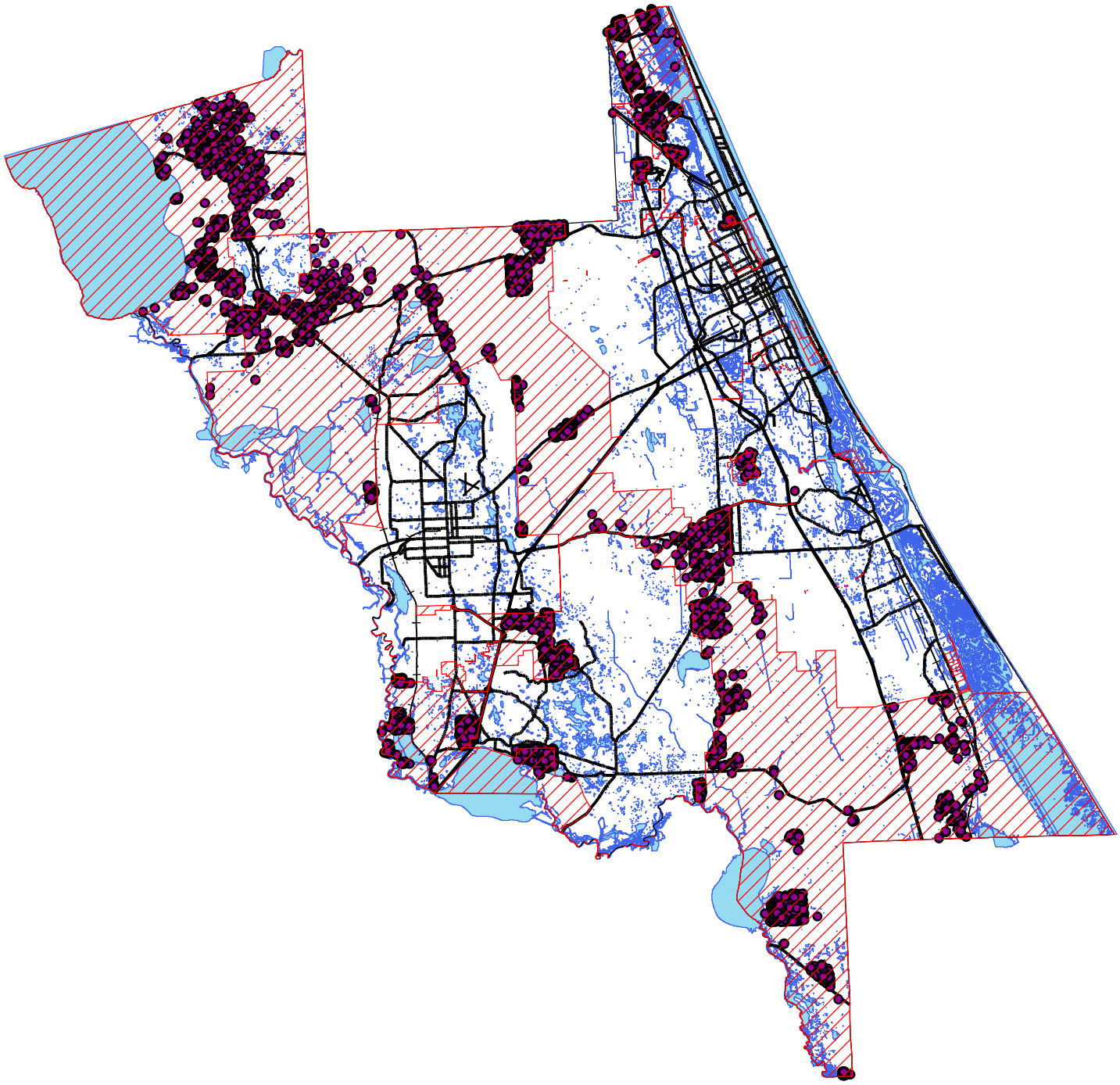
The enclosed shapefile titled question 6 represents the best information available to estimate the remaining number of traditional OSTDS within Volusia County's jurisdiction, consisting of a total of 7,653 OSTDS. Refer to **Appendix C** for Question 6 Shapefiles. Refer to **Figure 2** for a map of the remaining conventional OSTDS within Volusia County jurisdiction.

At this time, Volusia County has not calculated the number of those that will need to be converted to meet BMAP goals, as that number is completely dependent on the nutrient removal of other projects planned by participating local governments within each individual BMAP. For instance, the Volusia Blue BMAP requires a total reduction of 61,653 lbs/yr of nitrogen. Improvements to the regional water reclamation facility, adoption of a fertilizer ordinance, current or planned sewer projects, etc. will all reduce the total load. It is unknown how much of the load reduction remains, and therefore how many traditional systems must be converted. This level of analysis would be specific to each BMAP and is best addressed during the BMAP review process.

7. Estimated costs associated with upgrades identified in (6) above.
   The cost to develop a new sewer collection system is approximately $25,000 per OSTDS (in 2021 dollars).

8. Any other cost effective and financially feasible projects necessary to achieve nutrient load reductions for OSTDS to meet water quality objectives of the BMAP.
   Below is a list of OSTDS projects under consideration by Volusia County:
   - Connect privately operated package plants located within nutrient BMAP waterbodies to advanced wastewater treatment facilities.
   - Strengthen fertilizer bans and ordinances
   - Reduce nutrient loading from stormwater in coordination with OSTDS projects in order to reduce the overall cost/benefit ratio of projects to reduce TN loading.
   - Collaboration with local governments following their respective submittals to the Department.

Figure 2. Remaining OSTDS within Volusia County's Jurisdictional Area



Appendix A

Total Nitrogen and Total Phosphorus Historical Data

Total Nitrogen and Total Phosphorus Historical Data (Southwest Regional #1 FLA011128)

Plant	STP-1 / Southwest Regional			2019	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-19	0.3	7.5	120	2997	47.912
February-19	0.03	2.3	11	823	42.921
March-19	0.1	1.7	19	660	46.569
April-19	0.02	1.9	9	448	44.756
May-19	0.02	1.2	9	462	46.130
June-19	0.05	2.6	18	941	43.380
July-19	0.02	6.7	10	2772	49.607
August-19	0.1	3.1	24	1250	48.332
September-19	0.1	3.8	23	1469	46.359
October-19	0.1	2.7	38	1130	50.178
November-19	0.02	2.7	36	1062	47.172
December-19	0.2	1.5	64	596	47.666
Total	0.9	37.7	380	14,610	560.982
Monthly Avg	0.1	3.1	32	1,217	46.749
12					

Plant	STP-1 / Southwest Regional			2020	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-20	0.3	1.9	120	758	47.846
February-20	0.3	0.8	111	296	44.332
March-20	0.7	1.4	39	544	46.590
April-20	0.3	1.6	106	567	42.515
May-20	0.03	2.4	11	914	45.653
June-20	0.2	1.2	76	507	50.653
July-20	0.1	1.0	44	442	52.967
August-20	0.1	1.9	47	898	56.668
September-20	0.1	2.8	51	1439	61.602
October-20	0.2	4.0	103	2055	61.597
November-20	0.1	3.1	47	1460	56.468
December-20	0.1	2.0	45	905	54.279
Total	2.4	24.1	801.3	10784.4	621.170
Monthly Avg	0.2	2.0	66.8	898.7	51.764
12					

Plant	STP-1 / Southwest Regional			2021	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-21	1.7	1.9	751	839	52.965
February-21	0.3	0.6	122	245	48.931
March-21	0.5	2.1	218	917	52.360
April-21	0.2	1.8	87	787	52.402
May-21	0.2	1.3	101	573	52.856
June-21	1.0	1.3	442	574	52.933
July-21	0.1	1.6	48	761	57.011
August-21	0.6	2.0	295	984	58.982
September-21	0.05	3.0	22	1398	55.858
October-21	0.4	2.5	188	1175	56.359
November-21	0.1	3.7	45	1671	54.150
December-21	0.1	3.0	46	1376	54.979
Total / Year	5.1	24.8	2366.0	11298.8	649.786
Monthly Avg	0.4	2.1	197.2	941.6	54.149
12					

Plant	STP-1 / Southwest Regional			2022	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-22	0.2	2.1	90	945	53.935
February-22	0.1	2.1	41	853	48.674
March-22	0.3	1.4	141	660	56.486
April-22	0.2	3.2	93	1481	55.487
May-22	0.1	2.1	48	1004	57.298
June-22	0.6	5.7	269	2556	53.795
July-22	0.1	4.9	48	2326	56.909
August-22	0.1	2.2	49	1082	58.978
September-22	0.05	2.9	26	1509	62.406
October-22	0.1	2.5	60	1495	71.682
November-22	0.2	3.5	108	1893	64.862
December-22	1.1	11.7	565	6004	61.531
Total	3.2	44.3	1536.5	21805.9	702.043
Monthly Avg	0.3	3.7	128.0	1817.2	58.504
12					

Plant	STP-1 / Southwest Regional			2023	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-23	0.7	9.6	365	5010	62.574
February-23	0.4	1.3	185	601	55.440
March-23	0.3	2.2	144	1052	57.358
April-23	0.2	1.6	98	783	58.653
May-23	0.2	1.7	101	858	60.503
June-23	0.2	1.8	97	871	58.009
July-23	0.9	2.6	444	1284	59.260
August-23	1.5	3.8	818	2073	65.399
September-23	1.7	4.2	920	2274	64.909
October-23	0.1	3.4	56	1899	66.969
November-23	0.2	2.8	108	1505	64.443
December-23	0.1	2.4	55	1321	66.008
Total	6.5	37.4	3390.5	19529.8	739.525
Monthly Avg	0.5	3.1	282.5	1627.5	61.627
12					

Total Nitrogen and Total Phosphorus Historical Data (Southwest Regional #2 FLA011121)

Plant	STP-2 / Southwest Regional (Del. North)				2019
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-19	1.7	13.3	115	899	8.104
February-19	2.6	9.2	160	567	7.385
March-19	3.9	9.8	279	700	8.564
April-19	2.5	12.2	167	816	8.020
May-19	2.0	8.8	140	614	8.361
June-19	3.7	7.8	236	497	7.632
July-19	3.9	9.2	226	533	6.944
August-19	3.7	7.6	302	620	9.774
September-19	3.4	9.4	213	588	7.503
October-19	3.9	9.0	263	607	8.090
November-19	3.3	9.0	214	583	7.762
December-19	0.8	9.7	48	586	7.247
Total	35.4	115.0	2,361	7,608	95.386
Monthly Avg	3.0	9.6	197	634	7.949
12					

Plant	STP-2 / Southwest Regional (Del. North)				2020
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-20	0.9	10.7	57	678	7.601
February-20	0.7	7.6	45	489	7.720
March-20	2.1	5.6	150	400	8.564
April-20	2.5	5.6	157	352	7.532
May-20	1.6	6.8	98	417	7.347
June-20	2.3	6.5	136	384	7.083
July-20	2.3	7.6	145	478	7.539
August-20	2.6	6.9	172	457	7.934
September-20	1.5	7.7	104	532	8.288
October-20	3.2	12.1	236	892	8.843
November-20	2.4	7.2	167	502	8.362
December-20	3.1	8.4	210	569	8.118
Total	25.2	92.7	1676.7	6150.0	94.931
Monthly Avg	2.1	7.7	139.7	512.5	7.911
12					

Plant	STP-2 / Southwest Regional (Del. North)				2021
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-21	2.6	9.6	185	683	8.535
February-21	1.8	7.8	126	545	8.375
March-21	1.7	6.6	131	509	9.244
April-21	1.1	7.4	79	530	8.589
May-21	4.8	6.7	353	493	8.822
June-21	4.0	9.1	282	642	8.471
July-21	4.8	17.0	351	1244	8.773
August-21	3.7	8.5	286	657	9.268
September-21	4.3	10.0	318	739	8.862
October-21	3.8	9.8	341	776	9.497
November-21	2.2	10.4	165	782	9.016
December-21	2.1	7.5	163	581	9.293
Total	36.9	110.4	2779.9	8181.5	106.745
Monthly Avg	3.1	9.2	231.7	681.8	8.895
12					

Plant	STP-2 / Southwest Regional (Del. North)				2022
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-22	2.6	8.4	202	654	9.332
February-22	2.6	7.4	180	512	8.288
March-22	2.1	19.7	165	1547	9.417
April-22	3.9	15.5	294	1167	9.024
May-22	3.9	9.3	311	741	9.548
June-22	2.2	10.8	161	788	8.749
July-22	5.6	13.4	438	1048	9.376
August-22	4.8	24.2	219	1106	5.479
September-22	3.7	30.2	264	2154	8.552
October-22	6.0	12.6	463	971	9.243
November-22	3.9	11.4	312	913	9.604
December-22	4.8	15.3	376	1200	9.400
Total	46.1	178.2	3383.9	12799.1	106.012
Monthly Avg	3.8	14.9	282.0	1066.6	8.834
12					

Plant	STP-2 / Southwest Regional (Del. North)				2023
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-23	3.1	17.0	162	887	6.253
February-23	4.9	20.6	246	1033	6.015
March-23	14.8	20.9	772	1090	6.253
April-23	5.6	26.0	190	880	4.057
May-23	5.6	8.7	305	474	6.527
June-23	5.9	19.6	322	1071	6.550
July-23	5.8	9.1	443	695	9.157
August-23	5.7	6.2	171	186	3.598
September-23	3.7	5.4	113	165	3.658
October-23	5.5	7.9	167	240	3.637
November-23	4.3	6.0	108	151	3.016
December-23	4.6	2.5	125	68	3.261
Total	69.5	149.9	3122.8	6938.1	61.982
Monthly Avg	5.8	12.5	260.2	578.2	5.165
12					

Total Nitrogen and Total Phosphorus Historical Data (Southeast Regional FLA017413)

Plant	STP-7 / Southeast Regional		2019		
	Monthly	Monthly	Monthly	Monthly	
	Average	Average	Loading	Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-19	3.4	12.8	226	851	7.927
February-19	3.9	10.5	246	661	7.545
March-19	5.0	16.0	328	1049	7.865
April-19	5.1	16.6	303	986	7.120
May-19	6.1	15.5	353	896	6.927
June-19	4.1	15.0	259	946	7.566
July-19	5.3	17.6	335	1113	7.577
August-19	4.0	11.9	283	843	8.492
September-19	3.7	12.8	220	762	7.162
October-19	4.0	9.6	290	696	8.693
November-19	4.6	15.3	285	949	7.441
December-19	5.7	13.0	371	846	7.803
Total	54.9	166.6	3,499	10,599	92.118
Monthly Avg	4.6	13.9	292	883	7.677
12					

Plant	STP-7 / Southeast Regional			2020	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-20	5.0	19.2	321	1232	7.693
February-20	5.0	26.3	288	1514	7.196
March-20	4.4	25.8	287	1683	7.820
April-20	6.0	24.4	349	1420	6.977
May-20	6.3	12.1	393	754	7.471
June-20	5.0	11.1	324	720	7.772
July-20	4.2	10.6	323	814	9.207
August-20	3.8	12.6	287	952	9.062
September-20	3.2	9.5	275	816	10.302
October-20	3.0	10.1	257	901	10.288
November-20	3.6	9.6	265	707	8.828
December-20	4.6	15.0	299	976	7.803
Total	54.1	186.3	3667.7	12487.6	100.419
Monthly Avg	4.5	15.5	305.6	1040.6	8.368
12					

Plant	STP-7 / Southeast Regional			2021	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-21	5.3	10.5	331	656	7.490
February-21	4.8	19.0	294	1162	7.331
March-21	5.3	7.7	354	514	8.003
April-21	5.8	7.6	381	499	7.877
May-21	5.7	11.2	330	649	6.946
June-21	5.6	8.0	388	411	6.162
July-21	4.9	10.4	304	644	7.425
August-21	5.2	10.3	317	627	7.298
September-21	5.8	22.8	352	1384	7.276
October-21	4.7	18.7	335	1331	8.536
November-21	4.8	16.3	346	1174	8.637
December-21	5.1	13.6	316	842	7.427
Total	63.0	156.1	4045.5	9892.9	90.408
Monthly Avg	5.3	13.0	337.1	824.4	7.534
12					

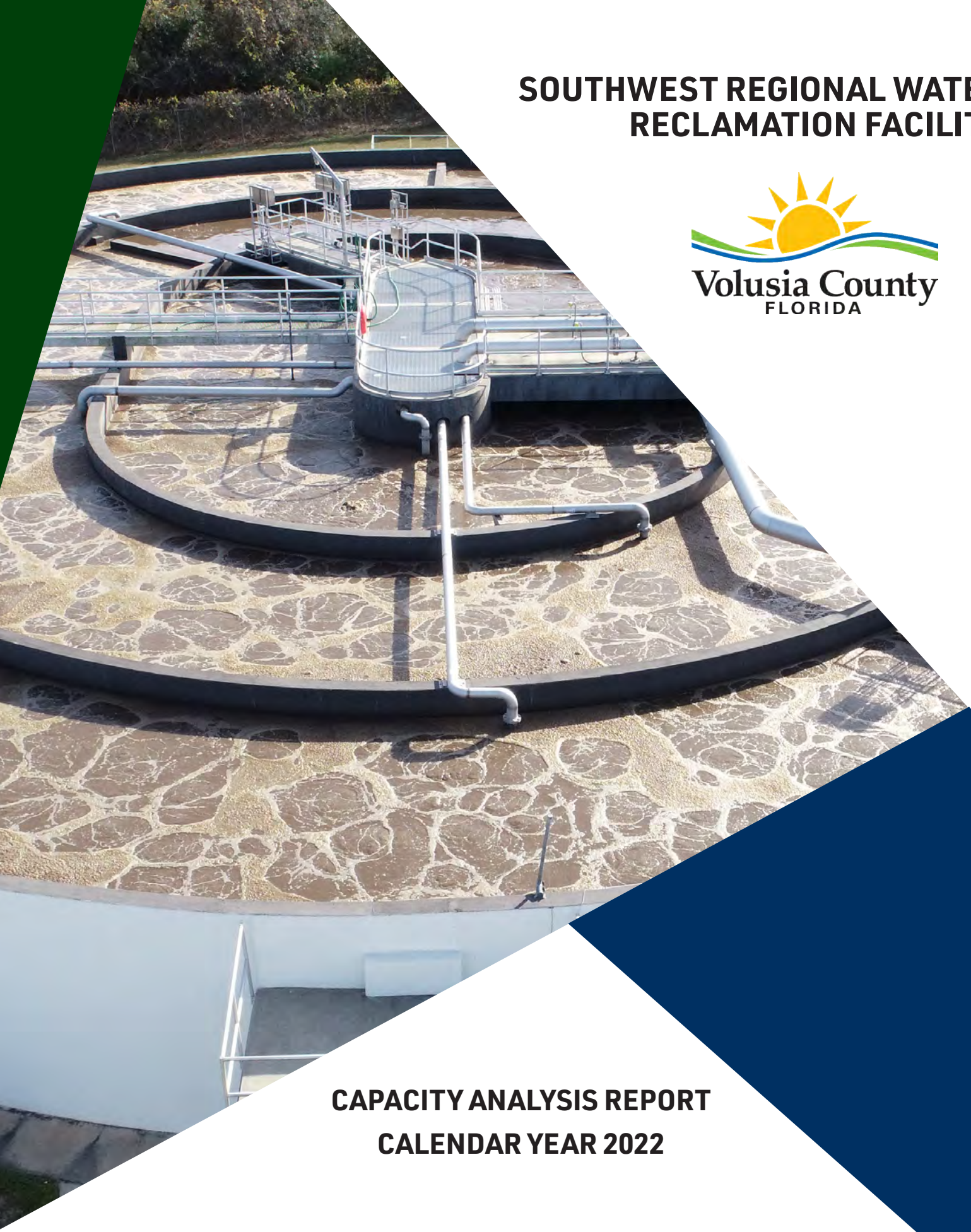
Plant	STP-7 / Southeast Regional			2022	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-22	5.3	14.0	318	841	7.203
February-22	4.8	20.0	298	1116	6.690
March-22	5.8	11.0	391	742	8.086
April-22	4.0	9.5	289	687	8.673
May-22	4.8	15.0	281	879	7.029
June-22	6.2	17.0	344	942	6.645
July-22	5.6	14.8	315	833	6.747
August-22	5.7	19.4	318	1083	6.691
September-22	4.6	11.4	306	758	7.977
October-22	3.4	8.0	281	661	9.907
November-22	4.5	8.8	336	658	8.965
December-22	5.5	15.6	432	1225	9.413
Total	60.2	164.5	3909.9	10424.7	94.026
Monthly Avg	5.0	13.7	325.8	868.7	7.836
12					

Plant	STP-7 / Southeast Regional			2023	
	Monthly Average	Monthly Average	Monthly Loading	Monthly Loading	
MCL	Total P mg/L	Total N mg/L	Total P	Total N	FLOW
DATE	EFA-1	EFA-1	lbs./month	lbs./month	MGD
January-23	6.1	18.7	484	1483	9.512
February-23	4.8	29.3	316	1927	7.885
March-23	6.1	14.8	446	1082	8.769
April-23	6.4	9.9	369	571	6.916
May-23	7.3	12.0	375	616	6.157
June-23	5.9	11.9	322	645	6.503
July-23	4.2	5.5	264	346	7.546
August-23	4.0	7.9	272	537	8.153
September-23	5.0	12.8	336	860	8.054
October-23	3.8	8.5	259	579	8.170
November-23	4.4	8.8	266	532	7.246
December-23	2.8	8.1	186	538	7.967
Total	60.8	148.2	3894.2	9717.3	92.878
Monthly Avg	5.1	12.4	324.5	809.8	7.740
12					

Appendix B

Capacity Analysis Reports

SOUTHWEST REGIONAL WATER RECLAMATION FACILITY



Volusia County
FLORIDA

CAPACITY ANALYSIS REPORT
CALENDAR YEAR 2022

MARCH 2023

cph

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SOUTHWEST REGIONAL WRF -

WASTEWATER MANAGEMENT SYSTEM

CAPACITY ANALYSIS REPORT - CALENDAR YEAR 2022

Volusia County
FLORIDA

MARCH 2023

CPH, Inc.
500 West Fulton Street
Sanford, Florida 32771
CPH Project No. V03116

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PERMIT	EXPIRATION DATE
Southwest Volusia Water Reclamation Facility FDEP Operations Permit FLA011128	**December 5, 2023**

CERTIFICATIONS

PERMITTEE

I am fully aware and intend to comply with the recommendations and schedules included in this Capacity Analysis Report (CAR) - Calendar Year 2022 for the Volusia County Southwest Regional WRF Wastewater Management System, prepared by CPH, LLC.

3/30/23
Date

Michael Ulrich
Water Resources and Utilities Director
Volusia County, Florida
Phone: (386) 736-5971
mulrich@volusia.org

PLANT OPERATIONS MANAGER

I have reviewed and am fully aware and intend to comply with the recommendations and schedules included in this Capacity Analysis Report (CAR) - Calendar Year 2022 for the Volusia County Southwest Regional WRF Wastewater Management System, prepared by CPH, LLC.

3/30/23
Date

Robert D Beedle
Bob Beedle
Plant Operations Manager
Volusia County, FL
Phone: (386) 822-6465
rbeedle@volusia.org

WRF SUPERVISOR

I have reviewed and am fully aware and intend to comply with the recommendations and schedules included in this Capacity Analysis Report (CAR) - Calendar Year 2022 for the Volusia County Southwest Regional WRF Wastewater Management System, prepared by CPH, LLC.

3/30/2023
Date

Preston Collum
WRF Supervisor
Southwest Regional WRF
Volusia County, FL
Phone: (386) 804-7786
pcollum@volusia.org

PROFESSIONAL ENGINEER

The information contained in the Capacity Analysis Report (CAR) - Calendar Year 2022 for the Volusia County Southwest Regional WRF Wastewater Management System is true and correct to the best of my knowledge, the report was prepared in accordance with sound engineering principles, and the Permittee is aware of the recommendations.

3/29/23
Date

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List of Abbreviations

AADF	Annual Average Daily Flow
AC	Acres
ADF	Average Daily Flow
AWT	Advanced Wastewater Treatment
BFP	Belt Filter Press
BMP	Best Management Practices
BNR	Biological Nutrient Removal
BOD	Biochemical Oxygen Demand
CAR	Capacity Analysis Report
$CBOD_5$	Carbonaceous Biochemical Oxygen Demand - 5 Day
CCC	Chlorine Contact Chamber
CFR	Code of Federal Regulations
CIP	Capital Improvements Plan
COD	Chemical Oxygen Demand
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
DT	Dry Tons
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FEB	Flow Equalization Basin
F/M	Food-to-Microorganism Ratio
FOG	Fats, Oils and Grease
GPCD	Gallons per Capita-Day
HDT	Hydraulic Detention Time
HP	Horsepower
HRT	Hydraulic Retention Time
IMLR	Internal Mixed Liquor Recycle
IWPP	Industrial Waste Pretreatment Program
kgal	1,000 gallons
lb	Pounds
lb/day	Pounds per day
MCRT	Mean Cell Residence Time
MDF	Maximum Daily Flow
mg	Milligram
mg/L	Milligrams per Liter
MG	Million Gallons
MGD	Million Gallons per Day
MLSS	Mixed Liquor Suspended Solids
MLVSS	Mixed Liquor Volatile Suspended Solids
MOP	Monitoring and Operating Protocol

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List of Abbreviations

NaOCl	Sodium Hypochlorite
NH_3-N	Ammonia-Nitrogen
O&M	Operations and Maintenance
ORP	Oxidation Reduction Potential
PAO	Phosphorus Accumulating Organisms
PC	Progressive Cavity
PD	Positive Displacement
pH	Negative logarithmic value of the hydrogen ion concentration/activity
PHF	Peak Hourly Flow
PVC	Polyvinyl Chloride
RAS	Return Activated Sludge
RIB	Rapid Infiltration Basin
RPM	Revolutions per Minute
SCADA	Supervisory Control and Data Acquisition
SLR	Solids Loading Rate
SNdN	Simultaneous Nitrification-Denitrification
SOR	Surface Overflow Rate
SRF	State Revolving Fund
SRT	Solids Retention Time
SU	Standard Unit
SWD	Side Water Depth
SWRWRF	Southwest Regional Water Reclamation Facility
TDH	Total Dynamic Head
TKN	Total Kjeldahl Nitrogen (Organic-N + NH_3-N)
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TRC	Total Residual Chlorine
TS	Total Solids
TSS	Total Suspended Solids
VFD	Variable Frequency Drive
VS	Volatile Solids
VSS	Volatile Suspended Solids
WAS	Waste Activated Sludge
WLR	Weir Loading Rate
WOR	Weir Overflow Rate
WRF	Water Reclamation Facility
WT	Wet Tons
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

SECTION 1

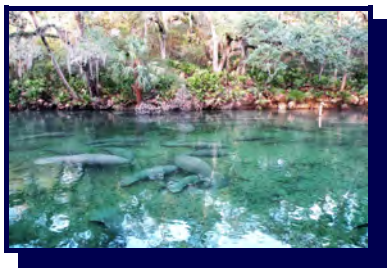
EXECUTIVE SUMMARY

1.1 GENERAL

In accordance with Chapter 62-600.405, F.A.C., *Planning for Wastewater Facilities Expansion*, Volusia County is required to conduct timely planning, design, and construction of wastewater treatment facilities necessary to provide proper treatment and reuse or disposal of domestic wastewater and management of domestic biosolids. This Rule requires the County to routinely compare flows being treated at the Southwest Regional Water Reclamation Facility with the permitted capacities of the treatment, biosolids, reuse, and disposal facilities. A Capacity Analysis Report (CAR) is required for the following:

- When submitting for an FDEP Operations Permit.
- When the three-month average daily flow, for the most recent 3 months, exceeds fifty percent (50%) of permitted capacity of the facility or reuse disposal system.
- As required by the Department (annual basis).

The greater Central Florida area experienced growth in the early part of the 21st century and the trend was expected to continue due to the general desirability of the local area. The growth had reached the Volusia County area as indicated in the increased number of construction projects in the local area between 2000 and 2008. As a result of this growth, ever increasing demands on water supplies and wastewater treatment capacities had been experienced which also generated a need to find a source for discharge of the treated wastewater and alternative water sources. Construction trends have been in flux during the past couple of years and all signs were indicating that the economy was beginning to recover as residential construction in the area had picked up. However, the impact of the COVID-19 pandemic, inflation in the economy, supply chain issues, energy issues, a potential impending recession, and the costs of materials, labor and commodities, on the timing of future growth in the area is unknown.



Due to the volumes of wastewater being processed and since direct discharge to surface waters is no longer an acceptable long-term or continuous solution, utilities are continually evaluating effluent disposal solutions that are more sensitive to the environment as well as developing water conservation methodologies. Highly treated wastewater effluent, or reclaimed water, has been recognized as an economical and beneficial source of water for residential, commercial and agricultural irrigation as well as surface water and wetlands recharge. Its use has also been found to be compatible with some industrial processes.

1.2 SOUTHWEST REGIONAL WRF

The Southwest Regional WRF is classified as an *Advanced Wastewater Treatment plus Filtration Facility* (Category I, Class B), utilizing the 4-Stage Bardenpho Process to treat the incoming wastewater from the service area and meets all Class I Reliability Criteria. The treatment facility consists of a anaerobic/anoxic flow equalization basin) followed by three (3) treatment trains containing the following treatment basins:

- Primary anoxic
- Aerobic
- Secondary anoxic

The MLSS from the three (3) treatment trains is conveyed to a common reaeration basin prior to secondary clarification, tertiary filtration and high-level disinfection. A high-quality reclaimed water/effluent is produced at the facility that is low in TN and TP. The facility has a treatment capacity of 2.700 MGD AADF and a reclaimed water/effluent disposal capacity of 4.750 MGD AADF.

The reclaimed water produced is used for slow-rate irrigation of *Public Access Reuse (PAR) sites* throughout the Southwest Regional WRF reclaimed water service area. Effluent flows in excess of the reclaimed water demand can be discharged to a series of *on-site* and *off-site* Rapid Infiltration Basins (RIBs). Design and current raw wastewater flows for the Southwest Regional WRF are as follows:

Flow Condition	Wastewater Flow Rate (MGD)	
	Design	Actual Operation - 2022*
Annual Average Daily Flow (AADF)	2.70**	1.923
Maximum Daily Flow (MDF)	5.40	3.040
Peak Hourly Flow (PHF)	6.75	

** Actual conditions from Jan - Dec 2022* *** Facility treatment capacity; permitted disposal capacity is 4.750 MGD AADF*

A review of the historical raw wastewater flows to the Southwest Regional WRF, during the past five (5) years and in Calendar Year 2022, are synopsized below:

Raw Wastewater Flow Condition	SWRWRF Raw Wastewater Flow (MGD)	
	2018 - 2022	Calendar Year 2022
Average Daily Flow	1.700	1.923
Maximum Day Flow	3.040	3.040
Monthly ADF Range	1.417 - 2.312	1.738 - 2.312
3-Month ADF Range	1.464 - 2.185	1.751 - 2.185
AADF Range (monthly rolling average)	1.516 - 1.922	1.782 - 1.922
% of Permitted Facility Capacity (ADF)*	**63.0%**	**71.2%**

* *Based on the current facility treatment capacity of 2.700 MGD AADF*

The effluent disposal systems are permitted through the facility's FDEP Operations Permit (FLA011128) as indicated below:

- *Land Application System (R-001): An existing 2.421 MGD AADF permitted capacity "slow-rate" public access system. R-001 is a reuse system which consists of an existing 2.0 MG wet weather storage pond at the DeBary Golf Course, 1.0 MG wet weather storage at the Deltona North WRF (storage tank), 2.0 MG of reject storage in the existing on-site Rapid Infiltration Basins (RIBs), with return capability to the facility for re-treatment, and irrigation within the Reuse Service Area.*

- *Land Application System (R-002): An existing 2.329 MGD AADF permitted capacity Rapid Infiltration Basin (RIB) system. R-002 is a reuse system which consists of the existing Four Towns RIBs with a total wetted area of 7.3 acres having a capacity of 0.30 MGD, Deltona North RIB No. 3 with a total wetted area of 2.54 acres having a capacity of 1.599 MGD, the "on-site" RIBs with a total wetted area of 4.2 acres having a capacity of 0.33 MGD, and the Terra-Alta RIBs with a total wetted area of 3.75 acres having a capacity of 0.10 MGD.*

The Southwest Regional WRF treatment system efficiencies, for Calendar Years 2021 and 2022, are presented below:

Table 1.2-1: SW Regional WRF Treatment System Efficiency (2021 - 2022) *

Parameter	Influent Conc. (mg/L)	Effluent Concentration		Parameter Removal (lb/day)	Percent Removal	
		(mg/L)	(lb/day)		Design	Actual
$CBOD_5$	256	1.9	29	3,929	95%	99.3%
TSS	223	1.0	16	3,427	95%	99.5%
TN**	50	2.4	37	736	94%	95.3%
TP**	8	0.3	4	120	87%	96.9%

* *AADF (2020 - 2021): 1.852 MGD*
** *Facility operational issue in Dec 2022 led to high effluent TN/TP concentrations (not included in TN/TP averages above)*

The Southwest Regional WRF has been functioning efficiently, meeting the effluent limitations required by the FDEP Operations Permit, during this period as indicated in the table above and within this Capacity Analysis Report. In addition, ***all current operational loadings on the unit operations and processes at the Southwest Regional WRF are within the normal loading rates that were used to establish the design capacity for the facility***.

Wastewater flow projections for the Southwest Regional WRF Wastewater Management System Service Area were generated using the assumptions outlined in Section 3, *Future Conditions*, of this Capacity Analysis Report (CAR). The wastewater flow projections are synopsized, through Design Year 2042, in a tabular format below:

Table 1.2-2: SW Regional WRF Wastewater Management System - Flow Projections

Design Year	SWRWRF Raw Wastewater Flow - AADF (MGD)	Deltona North WRF Flow Transfer - AADF (MGD)*	Septic Tank Flow - AADF (MGD)**	City of Deltona Fisher WWTF Flow Transfer AADF (MGD)***	Total Wastewater Flow Projection - AADF (MGD)
2022	1.923				1.923
2024	2.001	0.265			2.266
2026	2.082	0.276	0.058	0.204	2.619
2028	2.155	0.286	0.174	0.466	3.080
2030	2.231	0.296	0.290	0.482	3.299
2032	2.304	0.305	0.406	0.498	3.513
2034	2.374	0.315	0.522	0.513	3.723
2036	2.446	0.324	0.638	0.528	3.936
2038	2.507	0.332	0.754	0.542	4.135
2040	2.570	0.341	0.870	0.555	4.336
2042	2.635	0.349	0.986	0.569	4.539

* *New Master Lift Station constructed at the Deltona North WRF and all raw wastewater flows shall be transferred, over time, to the Southwest Regional WRF for treatment*

** *200 septic tanks per year connected to the SW Regional WRF at a wastewater generation rate of 230 gpd/dwelling.*

*** *Potential transfer of Deltona Fisher WWTP raw wastewater flows (50% of WW flow in 2025 and the remainder in 2027).*

Based on the raw wastewater flow projections, design of treatment facility improvements are currently underway at the Southwest Regional WRF and are anticipated to be completed and the systems operational in Calendar Year 2025.

The Southwest Regional WRF, Wastewater Management System and Reclaimed Water Service Areas are permitted under FDEP Operations Permit No. FLA011128. The reclaimed water/reuse system and the rapid infiltration basins (RIBs) have been very successful County programs since their inception. Reclaimed water storage facilities have also been developed throughout the regional area (2.0 MG golf course storage pond; and 3.0 MG and 1.5 MG reclaimed water ground storage tanks at the Southwest Regional WRF).

This Capacity Analysis Report (CAR) has been generated for the Southwest Regional WRF Wastewater Management System service area for Calendar Year 2022 and utilizes historical data, future raw wastewater flow projections, standard water and wastewater flow demands, and assumptions related to future raw wastewater flow transfers. The requirements outlined in the above referenced Rules are addressed and the report follows the guidelines outlined in the Florida Department of Environmental Protection's Manual entitled "*Guidelines for the Preparation of Capacity Analysis Reports*".

The Southwest Regional WRF, reclaimed water/reuse system and RIB systems have been meeting the requirements mandated in Chapter 62-610, F.A.C., the current FDEP Operations Permit, and all reclaimed water and groundwater standards. Volusia County has made a large capital investment in the SW Regional WRF Wastewater Management Program over the last twenty-nine (29) years and therefore ***the current reuse method, utilizing reclaimed water on public access sites and the rapid infiltration basins (RIBs), are the most beneficial and feasible solution for effluent disposal*** at the present time.

SECTION 2

EXISTING CONDITIONS

2.1 WASTEWATER MANAGEMENT SYSTEM SERVICE AREA

The Southwest Regional WRF Wastewater Management System Service Area includes the residential, commercial and rural portions of southwest Volusia County as presented in Figure 2.1-1. Population and corresponding raw wastewater flow projections are based on this service area. The raw wastewater is collected and conveyed via gravity sewers, lift stations and forcemains to the Southwest Regional Water Reclamation Facility (SWRWRF) located at 800 Debary Plantation Blvd., Debary, FL 32713, for advanced treatment and water reclamation.

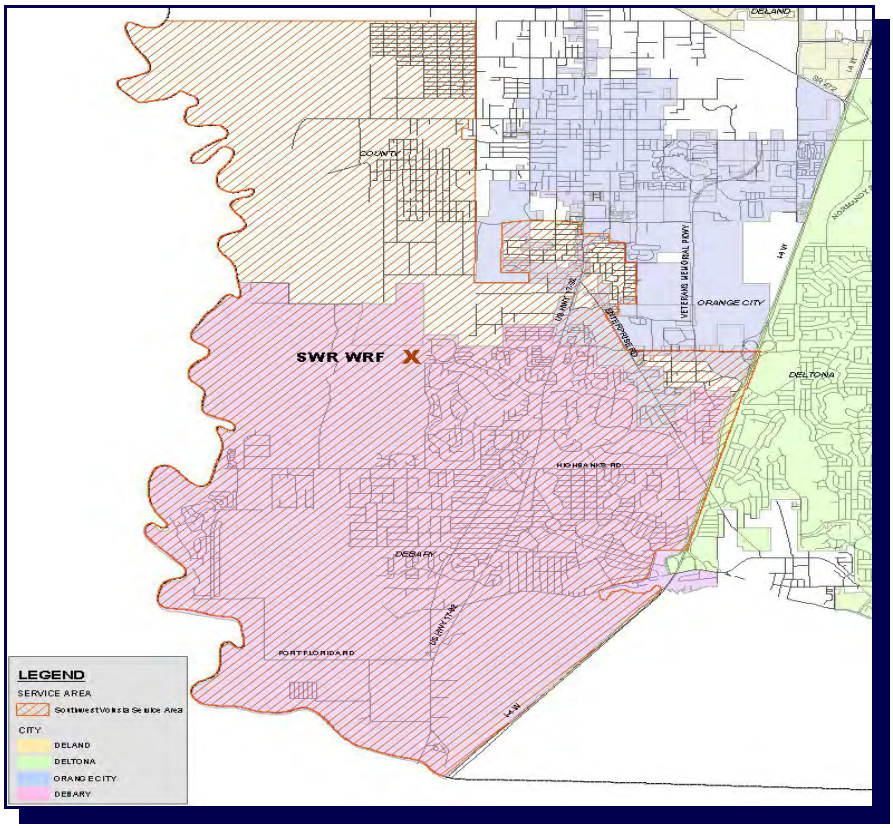


Figure 2.1-1: SWRWRF Wastewater Management System Service Area

The County currently owns and operates one water reclamation facility to process all of the wastewater generated in the Southwest Regional WRF Wastewater Management System service area and the biosolids produced in the treatment process. The facility is known as the Southwest Regional Water Reclamation Facility (SWRWRF), is located at the west end of DeBary Plantation along the FPL power easement, and provides high-level treatment of the raw wastewater using the 4-Stage Bardenpho BNR Process.

2.1.1 Existing Population and Land Uses

The current population within the service area is estimated to be 13,800. Population data was obtained from the Volusia County Utilities Department (VCUD), Florida Housing Data Clearinghouse and the U.S. Census Bureau. The residential and commercial construction trends have been in flux during the past few years and all signs were indicating that the economy was beginning to recover as residential construction in the area had picked up slightly. However, the impact of the COVID-19 pandemic, inflation in the economy, supply chain issues, energy issues, a potential impending recession, and the costs of materials, labor and commodities, on the timing of future growth in the area is unknown.

Land Use within the SW Regional WRF Service Area consists of the following:

- Residential (urban medium density, urban low density, mobile home)
- Commercial
- Rural
- Agricultural
- Light industrial

As the economy begins to pick back up slightly in the Central Florida region:

- The growth rate is expected to increase slightly over the next decade
- The State of Florida may potentially require septic tank owners in the Blue Spring area to connect to the Southwest Regional WRF collection and transmission system (estimated at approximately 5,000 septic tanks in the service area)
- The demand for collection and transmission system improvements, wastewater treatment facility improvements, and reclaimed water distribution system improvements will be required

2.2 ENVIRONMENTAL INVENTORY

2.2.1 General

The purpose of this Environmental Inventory is to provide a characterization of the existing environmental situation within the greater Southwest Volusia County area. Of importance is the protection of the quality of the existing environment and assurance that the facility and wastewater management system takes into account the existing natural resources.

Volusia County offers many natural resources and still contains some relatively pristine habitat areas for a number of native plant and animal communities. The Southwest Regional WRF Service Area experiences a mild climate, gentle terrain and clean air. In addition, Lake Monroe and the St. Johns River offer fishing and recreational activities to all outdoor enthusiasts.

The Southwest Regional WRF Wastewater Management System consists of the following infrastructure:

A large raw wastewater collection and transmission system consisting of gravity mains, pumping stations and force mains
Southwest Regional WRF, a 2.70 MGD AADF treatment capacity, consisting of primary treatment, a 4-Stage BNR treatment system, secondary and tertiary treatment processes, all designed to produce a high-quality effluent, reclaimed water, to be utilized via slow-rate public access spray irrigation throughout the service area
Reclaimed water storage and distribution system
Biosolids management system (aerobic digestion and dewatering)
Two (2) on-site Rapid Infiltration Basins (RIBs) at the Southwest Regional WRF
Off-Site RIBs at the following locations: Terra Alta, Deltona North and Four Towns
8.5 MG of reclaimed water storage throughout the service area

The protection of the natural resources within the Southwest Regional WRF Wastewater Management Service Area is of paramount importance and depends on many factors. The collection, transmission, treatment, and disposal infrastructure of the Southwest Regional WRF Wastewater Management Service area is based on the anticipated growth expected in the local area. The Southwest Regional WRF provides advanced wastewater treatment thereby reducing TN and TP mass loadings to Blue Spring and Blue Spring Run. Therefore, the high-level of environmental quality within the service area is consistently maintained.

2.2.2 Climate and Topography

The climate is classified as subtropical and mild. Based on data provided by the National Weather Service for the 30-year period from 1991 through 2022, the average annual temperature was 73°F with an average low temperature of 47°F occurring in January and an average high of 92°F in July and August. The normal rainfall for the region is approximately 54 inches per year. Under normal conditions, the majority of rainfall occurs between the months of June and October.

There have been no substantial changes to the service area's topography in the last twenty (20) years. A topographic map of the general Southwest Volusia County area is presented below in Figure 2.2-1.

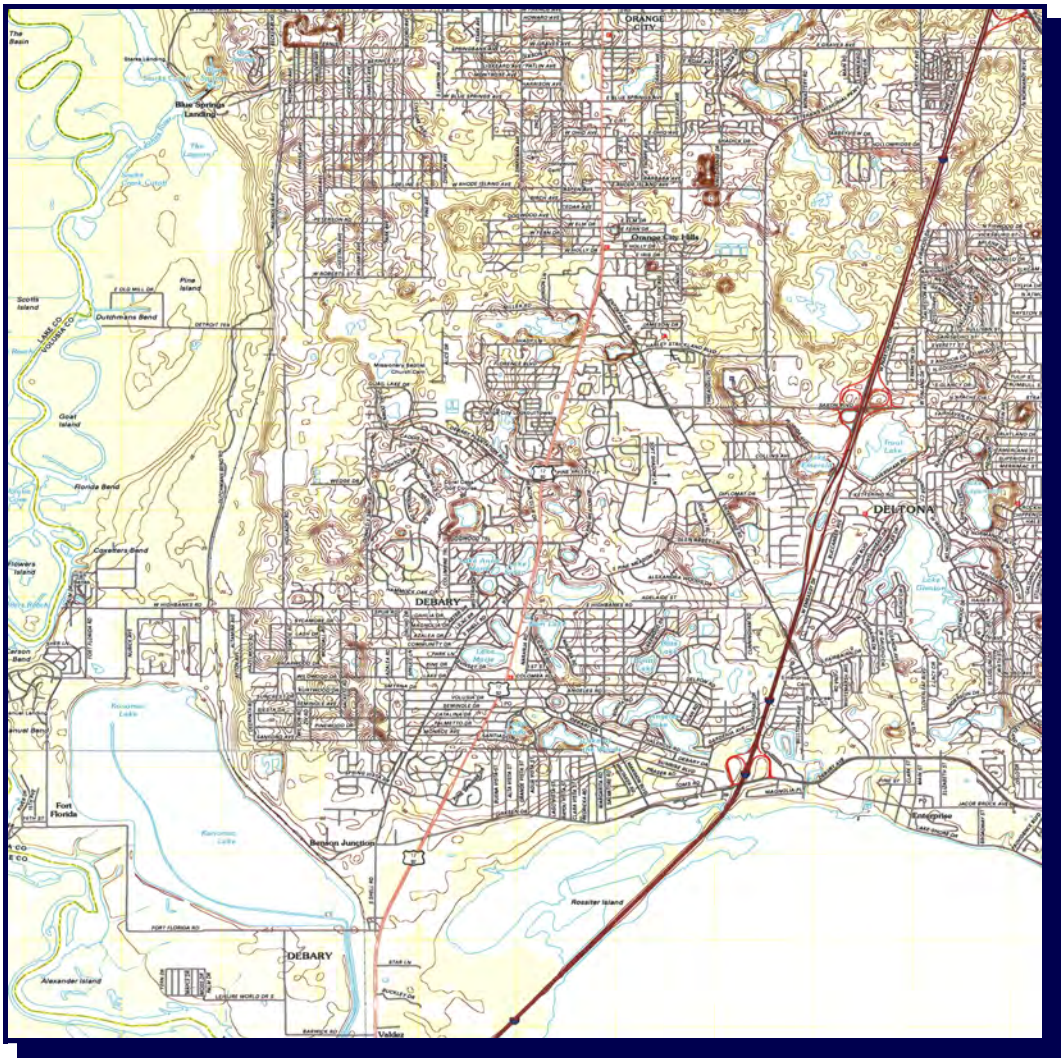


Figure 2.2-1: Southwest Volusia County Topographic Map

2.2.3 Soils and Groundwater

Soil types within the Southwest Regional WRF Wastewater Management System Service Area have been identified using the *Soil Survey of Volusia County, Florida (U.S. Department of Agriculture and Soil Conservation Service)*. A description of the primary soil types is presented below in Table 2.2-1:

Table 2.2-1: Southwest Volusia County, Florida - Primary Soil Types

Soil Type	Soil Percentage	Soil Description
Apopka Fine Sand	7.4%	Nearly level to strongly sloping areas of Urban Land, excessively drained soils that are sandy throughout, and well drained sandy soils that have a loamy subsoil at a depth of about forty (40) inches or more; on the uplands. The depth to the groundwater table is greater than 80 inches.
Bluffy Sandy Clay Loam	3.7%	Nearly level to slightly sloping areas of very poorly drained soils with a clay-loamy subsurface at a depth of 60 - 80 inches. The depth to the groundwater table typically ranges from 0 - 6 inches.
Eau Gallie	2.4%	Nearly level, poorly drained soils that are sandy throughout or have a loamy subsoil at a depth of forty (40) inches or more on Urban Land and on flatwoods. The depth to the groundwater table typically ranges from 6 - 18 inches.
Farmton Fine Sand	2.6%	Very deep, poorly drained, very slowly permeable soils on flatwoods. They are formed in sandy and loamy marine sediments. These soils are found on nearly level ground up to slopes of 2%. The depth to the groundwater table typically ranges from 6 - 18 inches.
Immokalee Sand	5.2%	Very deep, very poorly and poorly drained soils on flatwoods and in depressions. They are formed in sandy marine sediments. These soils are found on nearly level ground up to slopes of 2%. The depth to the groundwater table typically ranges from 6 - 18 inches.
Orsino Fine Sand	6.7%	Very deep, moderately well drained, very rapidly permeable soils that formed in thick beds of sandy marine or aeolian deposits. Typically found on moderately high ridges including dunes and on sites transitional from the higher ridges to more poorly drained soils (slopes of 0 - 5%). The depth to the groundwater table typically ranges from 42 - 60 inches.
Paola Fine Sand	9.7%	Very deep, excessively drained, very permeable soil on uplands. They formed in thick sandy marine deposits with depths typically greater than 7 feet. The depth to the groundwater table is greater than 80 inches.

Groundwater is withdrawn from the Floridan Aquifer, treated and pumped into the potable water distribution system. The groundwater is of high quality and is a valuable resource that must be conserved and renewed. The Volusia County Southwest Regional WRF Wastewater Management System Service Area is located within the St. Johns River Water Management District which has been classified as a Water Conservation Area. Therefore, conservation of the high quality groundwater is critical as witnessed by the County's development of a public access, slow-rate spray irrigation system and Rapid Infiltration Basin (RIB) program.

2.2.4 Physiographic Provinces

The majority of the Southwest Regional WRF Wastewater Management System Service Area is developed to serve residential, commercial and agricultural/rural areas. The service area varies topographically from 5 - 80 FMSL with the lower topographic elevations occurring near Lake Monroe and the St. Johns River. Diverse vegetative communities, springs and wetlands exist with the Southwest Regional WRF Wastewater Management System Service Area.

2.2.5 Surface Water Hydrology

Lake Monroe is a part of the St. Johns River System, a broad area of the river channel, and is classified as a Class III waterway. The St. Johns River originates approximately one hundred (100) miles south of Lake Monroe and flows north to Jacksonville where it eventually discharges into the Atlantic Ocean. However, at times, water does flow southerly from the Atlantic Ocean to Lake Monroe. Chloride levels within the St. Johns River and Lake Monroe average 280 mg/L and are estimated to vary annually between 37 and 600 mg/L. Water quality varies seasonally, especially during the summer months, when nutrient and suspended solids loadings are high due to the on-set of the rainy season.

There are also a limited number of land-locked lakes and water bodies within the greater Southwest Regional WRF service area. These water bodies are closed basins and have developed mainly in geologic depressions formed from sinkholes.

2.2.6 Air Quality

According to information obtained from the Florida Department of Environmental Protection (FDEP), Central District, in Orlando, Florida, the air quality is rated as *good*. However, the air quality varies throughout the year and is a function of rainfall, antecedent conditions and wind direction.

Due to the lack of heavy industry, there is no deterioration of air quality resulting from industrial operations. Open burning is strictly controlled by State and local ordinances. Therefore, any air pollution produced within the Southwest Regional WRF Wastewater Management System Service Area is typically generated from automobiles (emissions).

2.2.7 Biological Communities/Ecology

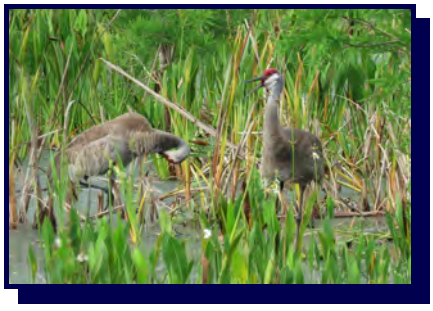
A. Wetlands

Wetlands within the Southwest Volusia County area include forested wetlands, shrub wetlands, herbaceous wetlands, and aquatic wetlands. Each of the wetlands types is briefly described below in Table 2.2-2.

Table 2.2-2: Southwest Volusia County, Florida - Wetland Types

Wetland Type	Wetland Description
Forested Wetlands	Complies with the forest crown closure requirements and are the results of natural seeding. Cypress, bayhead, hardwood swamp, and hydric hammock are types of forested wetlands.
Shrub Wetlands	Includes shrub swamp, shrub bog, and transitional shrub categories. Shrub wetlands are located throughout the central southern sections of the service area and are intermixed with herbaceous and forested wetlands.
Herbaceous Wetlands	Includes lake shore emergent, water lilies, deep marsh, and shallow marsh. Herbaceous wetlands are generally located in the central and eastern portion of the service area.
Aquatic Wetlands	Are defined as wetlands with a water table significantly above the ground surface during all seasonal climatic conditions.

The existing wetlands in the Southwest Volusia County area are designated to be protected and preserved from physical and hydrologic alterations. Wetland buffers are to be provided adjacent to all existing wetlands in accordance with County and State regulations.



B. Environmentally-Sensitive Areas

Environmentally sensitive areas are determined by local criteria which further the goals, objectives and policies described in the County's Comprehensive Plan. Wetlands have been designated as environmentally sensitive lands and development is not permitted in these areas. The County also requires the implementation of protective measures that preserve native plant and animal species.

Environmentally sensitive areas within the Southwest Regional WRF Wastewater Management System Service Area are designated by their relation to the functions of wetland preservation, surface water management, storage functions of the floodplain, protection of wildlife and wildlife habitats, and promotion of water quality. The County also protects the natural function of soils against erosion and development in areas with hydric soils.

Areas which are crucial to groundwater recharge are also protected against development that may be detrimental to the County's potable water supply.

The Southwest Regional WRF is producing an AWT quality product, thereby significantly reducing the nutrients (nitrogen and phosphorus) in the facility effluent and protecting Blue Spring and Blue Spring Run.

C. Listed Plant and Animal Species

Various plant and animal species occur within Southwest Volusia County area. Vegetative communities found within the Southwest Regional WRF Wastewater Management System Service Area include, but are not limited to, the following:

Pine Flatwoods	Shrub Wetlands
Forested Wetlands	Mesic Hammocks
Herbaceous Wetlands	

Xeric hammocks may also exist due to the presence of pine flatwoods and mesic hammocks.

Upland vegetative communities that exist within the Southwest Volusia County region are comprised of pine flatwoods and mesic hammocks. Pine flatwoods contain long-leaf pine and slash pine communities. The understory of these

areas is typically saw palmetto, wiregrass, wax myrtle, fetter bush and gallberry. Hammock communities contain broad-leaf evergreen trees, live-oak trees, and mixed hardwoods. The wetland communities are comprised of forested wetlands, shrub wetlands, herbaceous wetlands and aquatic wetlands which have been previously described herein.

The vegetative communities existing within the greater Southwest Volusia County area have been determined to support several dominant wildlife species as indicated below in Table 2.2-3:

Table 2.2-3: SW Volusia Co., FL - Dominant Wildlife Species Present	
Yellow-billed Cuckoo	Opossum
Prothonary Warbler	Fox Squirrel
Yellow-throated Warbler	Grey Squirrel
Red-bellied Woodpecker	Round-tailed Muskrat
Red-Winged Black Bird	Snipe
Summer Tanger	Deer
Horned Owl	Cotton Mouse
Egret	River Otter
Bittern	Marsh Rabbit
Pilated Woodpecker	Raccoon
Heron	Painted Turtle
Terns	Duck

2.2.8 Historical and Archeological Sites

Volusia County mandates that there shall be no loss of historic resources on County-owned property and historic resources on private property shall be protected, preserved, and/or reused in a manner sensitive to the historic quality of the site.

There are no known historical or archeological sites located within the Southwest Regional WRF site.

2.2.9 Floodplain

Volusia County mandates that the County shall incorporate floodplain protection measures that protect the value and function of the floodplain from encroachment by development. These measures include the reduction of land-use density within the floodplain, prohibition of septic tanks, hazardous materials, or waste in the floodplain. These measures are taken to protect and maintain the flood-carrying and flood storage capacity of the floodplain.

The County is required to maintain consistency with the program policies of the Federal Insurance Administration (FIA). The County will continue to monitor new cost-effective programs for minimizing flood damage.

The Southwest Regional WRF is built above the 100-year flood level (elevation varies from 62 - 67 FMSL) and will remain operational during said flood events.

2.2.10 Parks and Public Recreation Sites

Detailed information about the numerous parks and public recreational sites within the greater Southwest Regional WRF service area is contained in the Volusia County Comprehensive Plan. The Southwest Regional WRF and service area infrastructure have no significant impact on any of the parks, public properties or public recreational sites within the local area.

The Volusia County Southwest Regional WRF, an advanced wastewater treatment facility using the 4-Stage BNR Process, produces a high-quality reclaimed water product for slow-rate, public access spray irrigation and reduces TN and TP TMDL loadings to the local area, Blue Spring and Blue Spring Run.

2.3 VOLUSIA COUNTY GOVERNMENT

Volusia County was incorporated on December 29, 1854 when the Florida Legislature divided Orange County. The County's Council/Manager form of government consists of a County Manager and seven (7) County Council members.

The County Council typically meets on the first and third Tuesday of each month, in the Frank T. Bruno Jr. County Council Chambers (2nd floor) at the Thomas C. Kelly Administration Center in DeLand, Florida.

The County Council, as of the publication date of this Capacity Analysis Report (CAR), is comprised of the following individuals:

Table 2.3-1: Volusia County, Florida - County Council	
District 1 Commissioner	Don Dempsey
District 2 Commissioner	Matt Reinhart
District 3 Commissioner	Danny Robins
District 4 Commissioner	Troy Kent
District 5 Commissioner	David Santiago
At Large Commissioner	Jake Johansson
County Chair	Jeff Brower
County Manager	George Recktenwald

Development within Volusia County must comply with all local, State and Federal regulations.

2.4 EXISTING AREAS OF CENTRAL WASTEWATER SERVICE

The Southwest Regional WRF is served by an extensive wastewater collection and transmission system that is a combination of gravity systems and lift stations with force mains. The collection system conveys the wastewater from the wastewater management system to the Southwest Regional WRF located in the northwest portion of the service area. Portions of the collection/transmission system are over twenty-nine (29) years old.

The Southwest Regional WRF Wastewater Management System consists of sixty-six (66) major lift stations with force mains ranging in size from 4-inches to 12-inches. A list of the County-owned lift stations is presented in Appendix A. The gravity collection system pipelines range in size from 4 - 30 inches. There are also private lift stations that feed directly into the County's wastewater collection/transmission system. The Southwest Regional WRF receives the flows that were previously treated by the Four Towns WRF (forcemain constructed to convey raw wastewater flows to the Southwest Regional WRF for treatment). The Four Towns Rapid Infiltration Basins (RIBs) are still functional/operational and permitted through the FDEP as an effluent disposal system for the SW Regional Wastewater Management System (Land Application System R-002).

A master lift station and forcemain system are currently operational and are transferring a portion of the raw wastewater flows from the Deltona North WRF to the SW Regional WRF. The Deltona North RIBs will continue to be used for effluent disposal; however, the Deltona North WRF treatment facility infrastructure will be decommissioned, at a later date, in accordance with FDEP regulations.

2.5 SOUTHWEST REGIONAL WATER RECLAMATION FACILITY (SWRWRF)

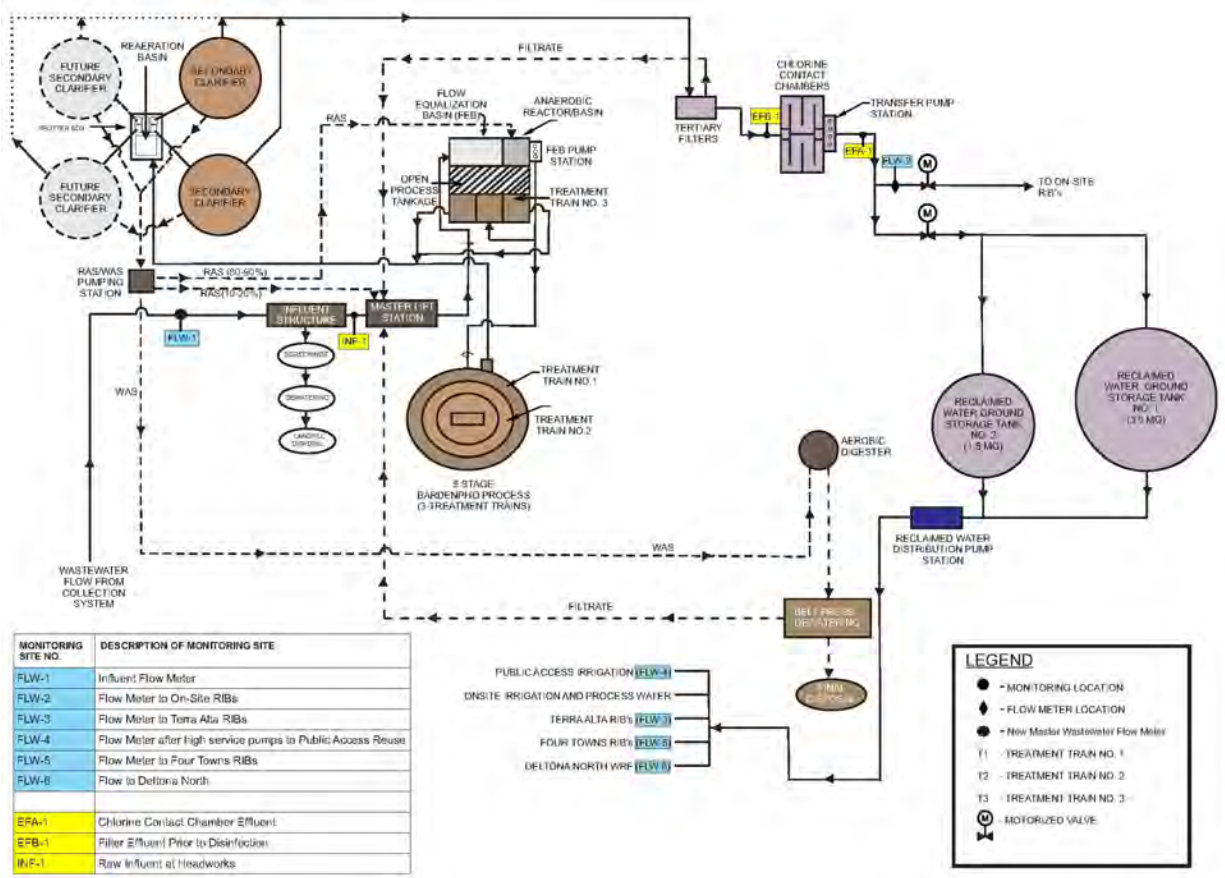
The Southwest Regional WRF is classified as an *Advanced Wastewater Treatment plus Filtration Facility (Category I, Class B)*, utilizing the 4-Stage Bardenpho Process and meets all Class I Reliability criteria. The Southwest Regional WRF and Reuse Service Area are currently permitted under FDEP Operations Permit No. FLA011128. A copy of the current FDEP Operations Permit is provided in Appendix B. The treatment facility consists of a common anaerobic/anoxic flow equalization basin followed by three (3) treatment trains. Each treatment train consists of the following treatment basins:

- Primary anoxic basin
- Aerobic basin
- Secondary anoxic basin

The MLSS from the three (3) treatment trains is conveyed to a common reaeration basin prior to secondary clarification, tertiary filtration and high-level disinfection. A high-quality reclaimed water/effluent is produced at the facility that is low in TN and TP. The current treatment capacity of the facility is 2.70 MGD AADF with a reclaimed water/effluent disposal capacity of 4.750 MGD AADF.

An aerial view and schematic flow diagram of the Volusia County Southwest Regional WRF are presented in Figures 2.5-1 and 2.5-2, respectively.

Figure 2.5-1: Southwest Regional WRF - Aerial View



MONITORING SITE NO.	DESCRIPTION OF MONITORING SITE
FLW-1	Influent Flow Meter
FLW-2	Flow Meter to On-Site RIBs
FLW-3	Flow Meter to Terra Alta RIBs
FLW-4	Flow Meter after high service pumps to Public Access Reuse
FLW-5	Flow Meter to Four Towns RIBs
FLW-6	Flow to Deltona North
EFA-1	Chlorine Contact Chamber Effluent
EFB-1	Filter Effluent Prior to Disinfection
INF-1	Raw Influent at Headworks

FIGURE 2.5-2 **SOUTHWEST REGIONAL WRF - SCHEMATIC FLOW DIAGRAM**

The unit operations and processes currently employed at the Southwest Regional WRF are divided into the following treatment elements/categories:

Treatment Elements	Description
Primary Treatment	Two (2) automatic, continuous self-cleaning mechanical barscreens (2 mm and 6 mm units), a manual barscreen (12 mm), screenings compacting/dewatering screw system and an in-line flow equalization basin.
Secondary Treatment	Biological oxidation of organic wastes using a 2.70 MGD AADF 4-Stage Bardenpho Biological Nutrient Removal Process (primary anoxic, aerobic, secondary anoxic, deoxygenation and reaeration basins). The BNR treatment process consists of three (3) parallel treatment trains, diffused aeration systems, turbo blowers, submersible mixing systems, secondary clarification, and a RAS/WAS pumping system.
Tertiary Treatment	Tertiary filtration via two (2), self-contained, automatically operating, disc filtration units.
Disinfection System	High-level disinfection is accomplished through the use of a dual-compartment Chlorine Contact Chamber (CCC) and bulk liquid NaOCl chemical feed and storage systems.
Sludge Treatment	Sludge treatment consists of an aerobic digestion system with aeration, sludge pumping and a dewatering system (Winklepress). Sludge from the Southwest Regional WRF and imported sludge from other County-owned wastewater treatment facility's are processed here. Stabilized and dewatered biosolids are transported to Shelley's Environmental System's for further treatment and ultimate disposal.

Influent and effluent design criteria for the Southwest Regional WRF are presented below.

Table 2.5-1: SW Regional WRF Influent and Effluent Design Criteria

Parameter	Units	Influent	Tertiary Effluent
$CBOD_5$	mg/L	300	< 5
TSS	mg/L	300	< 5*
TKN	mg/L	50	
NH_3-N	mg/L	35	< 1
TN	mg/L		< 3**
TP	mg/L	8	≤ 1***
Wastewater Temperature (min/max)	°C	18 / 28	
Alkalinity	mg/L as $CaCO_3$	100 - 200	
pH	S.U.	6.0 - 8.5	6.0 - 8.5

* After Tertiary Filtration (disc filtration system).
** A supplemental carbon source may be required.
*** A coagulant may be required to meet this requirement.

Raw wastewater flows from the collection/transmission system enter the Southwest Regional WRF through the Influent Structure at the southern end of the treatment facility. The Influent Structure consists of a cast-in-place concrete structure with three (3) inflow channels. The two (2) outer channels can be isolated using sluice gates located at the entrance to each channel. The center channel is a bypass channel that contains a stainless steel manual barscreen and is preceded by a concrete bypass weir. If the raw wastewater flow rate increases beyond the capacity of the outer channel(s), raw wastewater levels will rise, overflow the bypass weir and be conveyed through the center channel and the integral manual barscreen (12 mm openings). The east and west (outer) channels of the Influent Structure contain automatic, continuous, self-cleaning mechanical barscreens (6 mm and 2 mm openings, respectively). Approximately 10 - 20% of the RAS is conveyed to the Influent Structure and is mixed with the raw wastewater to provide odor control within the Influent Structure and Master Lift Station. The three (3) influent channels converge at the end of the Influent Structure and the screened wastewater is discharged into the integral Master Lift Station. Screenings from the mechanical barscreens are conveyed to separate compacting/dewatering systems (shaft-less screws) for dewatering prior to discharge to a municipal dumpster (landfill disposal).

Influent Structure and Barscreens

Following screening, the raw wastewater is conveyed, by gravity, to the Master Lift Station where it is automatically pumped to the in-line flow equalization basin. The Master Lift Station consists of a rectangular concrete wetwell structure with a working capacity of 46,047 gallons (6,156 ft^3). Four (4) submersible pumps, each with a capacity of 2,380 gpm (3.427 MGD) at 33 feet TDH, are provided to convey the raw wastewater to subsequent treatment processes. An additional pump can be added, in a future expansion, to increase the station's pumping capacity.

Master Lift Station

Design and current wastewater flows for the Southwest Regional WRF are as follows:

Table 2.5-2: Southwest Regional WRF - Current Design and Actual Flows

Flow Condition	Raw Wastewater Flow Rate (MGD)	
	Design	Actual Operation - 2022*
Annual Average Daily Flow (AADF)	2.70**	1.923
Maximum Daily Flow (MDF)	5.40	3.040
Peak Hourly Flow (PHF)	6.75	

* *Actual conditions from Jan - Dec 2022.* ** *Facility treatment capacity.*

Raw wastewater flows enter the two-chamber, in-line, Flow Equalization Basin, located on the south side of the Southwest Regional WRF, where flow and constituent attenuation are provided. The wastewater in the Flow Equalization Basin is mixed, through the use of a large-bubble mixing system, to ensure that the fluid is homogeneous and kept in an anaerobic/anoxic condition. RAS from the secondary clarification system is blended into the raw wastewater mixture, thereby providing odor control and the initial conditioning of the microbial mass. Characteristics of the in-line Flow Equalization basin are presented below in Table 2.5-3.

Flow Equalization Basin (FEB)

Table 2.5-3: In-Line Flow Equalization Basin (FEB) Design Characteristics

Parameter	Value
Flow Equalization Basin (FEB) Chambers	2
Flow Equalization Basin (FEB) Operation	Series
Flow Equalization Basin (FEB) Chamber Length (feet)	50
Flow Equalization Basin (FEB) Chamber Width (feet)	50
Flow Equalization Basin (FEB) Sidewater Depth (feet)	14
Flow Equalization Basin (FEB) Chamber Volume, each (MG)	0.262
Average Detention Time at AADF (hours)	4.65

The fluid then flows, by gravity, to one of the two integral anaerobic/anoxic reactor basin compartments (1st stage - series operation). The MLSS is mixed, through the use of a large-bubble mixing system, creating a stressed condition that allows phosphorus to be biologically removed from the wastewater in subsequent aerobic stages.

Design characteristics of the anaerobic/ anoxic basin(s) at the Southwest Regional WRF are presented below in Table 2.5-4.

Anaerobic Reactor Basin(s)

Table 2.5-4: Anaerobic/Anoxic Basin Design Characteristics		
Parameter	**Units**	**Value**
Anaerobic/Anoxic Basin Chambers/Operation		2 / Series
Anaerobic/Anoxic Basin Length, each	feet	50
Anaerobic/Anoxic Basin Width, each	feet	24
Anaerobic/Anoxic Basin Sidewater Depth	feet	13.5
Anaerobic/Anoxic Basin Chamber Volume, each	MG	0.121
Average Detention Time at AADF*	hours	1.08

* *50% of the anaerobic basins volume is "fluctuating"*

The Flow Equalization Basin (FEB) pump station conveys the fermented liquid from the anaerobic/anoxic basin to the primary anoxic basin of each BNR treatment train. The primary anoxic basin functions as the main denitrification zone in the treatment process. The Mixed Liquor Suspended Solids (MLSS) and Internal Mixed Liquor Recycle (IMLR) streams bring nitrate from the aerobic basin into contact with the influent organic matter (BOD_5). Heterotrophic bacteria convert the nitrate to nitrogen gas and consume a portion of the influent BOD_5 in the process. Some phosphorus accumulating organisms (PAOs) are also capable of denitrification in this basin.

FEB Pump Station

Design characteristics of the primary anoxic basins, in each BNR Treatment Train, are presented below in Table 2.5-5:

Table 2.5-5: Primary Anoxic Basin Design Characteristics				
Parameter	**Units**	**BNR Treatment Train**		
		No. 1	**No. 2**	**No. 3**
Wastewater Flow to Basin (AADF)	MGD	1.0	1.0	0.7
Volume of Primary Anoxic Basin No. 1	gallons	68,750	68,750	168,750
Volume of Primary Anoxic Basin No. 2	gallons	68,750	68,750	
Sidewater Depth	feet	11.5	11.5	11.5

The MLSS from the primary anoxic basin flows, by gravity, to the aerobic basin in each of the three (3) BNR treatment trains. The aerobic basin contains heterotrophic bacteria (suspended growth) and provides the detention time and oxygen transfer required for oxidation of the influent organic compounds, nitrification, and phosphorus uptake. Design characteristics of the aerobic basins are presented below in Table 2.5-6:

Table 2.5-6: Aerobic Basin Design Characteristics

Parameter	Units	BNR Treatment Train		
		No. 1	No. 2	No. 3
No. of Aerobic Basins per BNR Train		1	2	2
Flow Rate	MGD	1.0	1.0	0.7
Volume of Aerobic Basin No. 1	gallons	340,000	240,000	171,875
Volume of Aerobic Basin No. 2	gallons		110,000	171,875
Side Water Depth	feet	11.0		13.0
Hydraulic Detention Time	hours	13.2		11.8
Solids Retention Time	days	6.9		6.2
Aeration System Type		Fine-Bubble		
MLSS Concentration at 20°C	mg/L	2,500 - 4,000		
System F/M Ratio	lb BOD_5/day/lb MLSS	0.23		0.05
Design Sludge Yield	lb MLSS/lb BOD_5 applied	0.83		0.54
Sludge Production	lb/day	4,500		1,420

MLSS is discharged from the aerobic basin to the deoxygenation basin in BNR Treatment Trains No. 1 and No. 2 (no deoxygenation basin in Train No. 3). The function of the deoxygenation basin is to reduce the MLSS dissolved oxygen concentration prior to the secondary anoxic basin to facilitate efficient denitrification. A pulsed, large-bubble aeration system is used to keep the MLSS mixed without adding any significant oxygen. A single IMLR submersible wall pump is installed in each deoxygenation basin to recycle MLSS to the primary anoxic basin.

Treatment Trains No. 1 and No. 2

Design characteristics of the deoxygenation basins, in BNR Treatment Trains No. 1 and No. 2, are presented below in Table 2.5-7.

Table 2.5-7: Deoxygenation Basin Design Characteristics*			
Parameter	**Units**	**BNR Train No. 1**	**BNR Train No. 2**
No. of Deoxygenation Basins per BNR Train		1	1
Volume of each Deoxygenation Basin	gallons	16,500	16,500
Mixing System Type		Large-Bubble	
Total Mixing Air Requirement	scfm	80	80

* *Treatment Trains No. 1 and No. 2 only. There is no deoxygenation basin in Treatment Train No. 3.*

The deoxygenation basin flow is conveyed, by gravity, into the secondary anoxic basin which provides removal of nitrogen species via the denitrification process. A large-bubble mixing system is utilized in the secondary anoxic basins to keep the contents mixed without adding any additional dissolved oxygen. Supplemental carbon can be added to the upstream end of the secondary anoxic basins, as necessary, to provide a carbon source for efficient denitrification.

Design characteristics of the secondary anoxic basins , in BNR Treatment Trains No. 1 and No. 2, are presented below in Table 2.5-8.

Table 2.5-8: Secondary Anoxic Basin Design Characteristics		
Parameter	**Units**	**Values**
No. of Secondary Anoxic Basins per BNR Treatment Train		1
No. of Stages per Basin		1
Volume of each Secondary Anoxic Basin, gallons	gallons	60,000
Basin Sidewater Depth	feet	11
Total Volume of all Secondary Anoxic Basins	gallons	120,000
Hydraulic Detention Time per Secondary Anoxic Basin*	hours	1.40
MLSS Concentration at 20°C, mg/L		4,000

* *At AADF (2.0 MGD) - Treatment Train No. 1 and No. 2 only*

Following the secondary anoxic basins, the MLSS from all three (3) BNR Treatment Trains, is conveyed to a common reaeration basin where the MLSS is aerated. This is the final step in the 4-Stage Bardenpho Process where nitrogen micro-bubbles attached to the floc (from the secondary anoxic basin) are stripped from the mixed liquor, any residual soluble BOD remaining from the supplemental carbon addition is oxidized, and the mixed liquor is oxygenated.

A coagulant (alum, ferric chloride, etc.) can be added to the MLSS at the entrance to the reaeration basin to assist in the chemical precipitation/removal of phosphorus from the final effluent, as necessary, to meet the regulatory effluent total phosphorus (TP) requirements.

Design characteristics of the common reaeration basin and associated equipment are presented below in Table 2.5-9.

Table 2.5-9: Common Reaeration Basin Design Characteristics

Parameter	Units	Values
No. of Reaeration Basins		1
Sidewater Depth	feet	10.5
Reaeration Basin Volume	gallons	20,000
Hydraulic Retention Time (HRT) at AADF	minutes	10.7
Aeration System Type		Medium Bubble

The 4-Stage Bardenpho Process is designed to produce a high-quality effluent in accordance with all regulatory requirements. Secondary clarification of the biologically treated wastewater from the 4-Stage Bardenpho Process is provided to remove Mixed Liquor Suspended Solids (MLSS), flocculated suspended solids and chemical precipitates and to meet the effluent criteria mandated by FDEP, EPA and Class I Reliability. Secondary clarification is provided by two (2) identical 60-foot diameter, 14'-8" sidewater depth, cast-in-place concrete clarifiers with full-surface skimmers, energy dissipating inlets and spiral scrapers. Design characteristics of the secondary clarifiers are presented below in Table 2.5-10.

Secondary Clarification System

Table 2.5-10: Secondary Clarification System Characteristics

Parameters	Units	AADF Design	Actual Operation - 2022**
Surface Overflow Rate (SOR)	gpd/ft^2	477	342
Weir Overflow Rate (WOR)	gpd/ft	4,054	2,887
Hydraulic Detention Time**	hours	5.5	7.7
Solids Loading Rate (SLR)*	lb MLSS/day/ft^2	24.4	17.4

* *Based on 3,500 mg/L MLSS and 75% recycle* ** *Based on data from Jan - Dec 2022 (two clarifiers in service)*

Tertiary filtration of the wastewater is required to ensure protection of public health and enhance the disinfection process. A chemical dose (alum/polymer) may be introduced, as necessary, at the secondary clarifier flow splitter boxes (reaeration structure) to enhance TSS removal should the effluent be approaching the mandated maximum concentration. The secondary clarifier effluent flows to the tertiary filtration system common influent line. A valving system is used to control the flow to the tertiary filtration units. Tertiary filtration is accomplished through the use of two (2) disc filtration units. Design characteristics of the tertiary filtration system are presented below in Table 2.5-11.

Table 2.5-11: Tertiary Filtration System - Design Characteristics

Design Parameter	Units	Value
Total Filtration Capacity of each Unit, AADF	MGD	1.50
Tertiary Filter - Filtration Surface, total	ft^2	2,654
Total "Submerged" Filter Surface Area	ft^2	1,176
Effluent TSS	mg/L	< 5
Designed for Class I Reliability		Yes

Design and current operating characteristics of the tertiary filtration system, at AADF, are as follows:

Table 2.5-12: Tertiary Filtration System Design/Operating Characteristics

Parameter	Units	Recommended Std	AADF Design	Actual Operation - 2022*
Filtration Rate	gpm/ft^2	< 6	1.77	1.14
Effluent TSS	mg/L	< 5	< 5	1.0

* *Based on data from January - December 2022 (both disc filters in operation)*

Each HydroTech Disc Filter consists of multiple discs mounted on a center feed drum. During normal operation, the secondary effluent enters the disc segments, by gravity, via the center feed drum. Filter panels, which are mounted on two (2) sides of the disc segments, separate solids from the secondary effluent. The solids are collected within the filter discs, while the filtered water flows to the outside of the disc and into the stainless steel tank (inside which the disc filter units are mounted). The disc filter units are installed within a concrete containment area.

Tertiary Filtration System (Disc Filters)

The disc filters operate at approximately sixty-five percent (65%) submergence with a clean filter headloss of 2 - 6 inches across the media. Normal continuous operation occurs until the maximum allowable headloss of twelve (12) inches is attained. When this condition occurs, backwashing of the tertiary filtration unit is automatically initiated. During the backwash cycle, the discs are rotated and the solids are collected in an interior collection trough. The backwash cycle utilizes approximately 2 - 5% of the total throughput volume of effluent to the tertiary filter to clean the filtration discs. The filtrate is then conveyed back to the treatment system for processing.

From the tertiary filters, the treated wastewater flows by gravity to a cast-in-place concrete Chlorine Contact Chamber (CCC). The CCC provides high-level disinfection of the effluent through the application of liquid sodium hypochlorite (NaOCl) via a flow-paced control system. The Chlorine Contact Chamber is divided into two (2) distinct compartments each with a capacity of 5,541 ft^3 (41,447 gallons). Each chamber is sized for fifty percent (50%) of the total flow in accordance with Class I Reliability Criteria. Bulk sodium hypochlorite is metered and mixed into the tertiary effluent and the CCC provides the contact time for the inactivation of fecal coliforms, pathogens and other microbial organisms. Bulk sodium hypochlorite (NaOCl) is stored at the facility in two (2) 4,900 gallon chemical storage tanks. Chemical metering pumps (flow-paced) are used to feed the liquid sodium hypochlorite into the tertiary effluent.

Chlorine Contact Chambers

The overall Chlorine Contact Chamber contact volume and contact time are as follows:

Table 2.5-13: SWRWRF Chlorine Contact Chamber Characteristics

System	Hydraulic Volume		Chlorine Contact Time (minutes)	
	ft^3	gallons	AADF Design*	Actual Operation - 2022**
CCC	11,082	82,893	44.2	62.1

** Based on Treatment Capacity of 2.7 MGD AADF and both CCC compartments* *** Both CCC compartments operational.*

After high-level disinfection, the effluent flows to the transfer pump station which is integral to the CCC structure. The transfer pump station consists of a cast-in-place concrete wetwell and three (3) pumps each with a rated capacity of 2,000 gpm. The transfer pump station is designed and built to accept two (2) additional pumps to meet the facility future flow conditions.

Transfer Pump Station

Total Suspended Solids (TSS) and Total Residual Chlorine (TRC) are analyzed continuously and automatically at the Southwest Regional WRF in accordance with the existing FDEP Operations Permit conditions. ***Any reclaimed water that does not meet the Public Access Criteria will not be pumped*** to the Reclaimed Water Ground Storage Tanks and will be conveyed to the on-site Rapid Infiltration Basins (RIBs).

Reclaimed water meeting the Public Access Criteria is pumped from the Transfer Pump Station to a pair of Reclaimed Water Ground Storage Tanks. The pre-stressed concrete storage tanks are in-line equalization facilities that provide an effluent water quality buffer before it is pumped to the reclaimed water distribution system. The reclaimed water ground storage tanks have storage volumes of 1.5 MG and 3.0 MG, respectively.

Reclaimed Water Ground Storage Tanks

There are two (2) Rapid Infiltration Basins (RIBs) at the Southwest Regional WRF for effluent disposal via groundwater recharge. RIB No. 1 has a total surface area of 1.9 acres and a disposal capacity of 0.300 MGD. RIB No. 2 has a total surface area of 2.3 acres and a disposal capacity of 0.030 MGD. Additional RIBs are located at the following off-site locations: Four Towns RIB system (0.300 MGD capacity); Deltona North RIB system (1.599 MGD capacity); and Terra Alta RIB system (0.100 MGD).

The Reclaimed Water Distribution Pump Station conveys reclaimed water from the ground storage tanks to the distribution system for final disposal. The pump station is designed to deliver approximately 5.04 MGD to the reclaimed water distribution system with the largest pump out of service and consists of the following pumps: two (2) pumps, each with a rated capacity of 1,400 gpm; and three (3) pumps, each with a rated capacity of 700 gpm.

RW Distribution Pump Station

Volusia County's Wastewater Management Plan is a program of water reuse. Following the reclamation process at the Southwest Regional WRF, highly treated reclaimed water is distributed throughout the regional planning area as follows:

Public Access Spray Irrigation			
DeBary Plantation Golf Course	Glen Abbey	Rivington Development	Saxon Woods Subdivision
DeBary Golf and Country Club	Progress Energy	Spgs & Park View/Reserve	Orange City (wholesale)
Rapid Infiltration Basin (RIB) Systems			
Four Towns	Terra Alta	SW Regional WRF	Deltona North WRF

The biosolids management system at the Southwest Regional WRF consists of the following infrastructure:

- One (1) aerobic digester
- One (1) belt filter press (Winklepress)
- One (1) biosolids belt-conveying system

Aerobic Digestion System

The Southwest Regional WRF is used to treat and dewater the sludge generated from the Southwest Regional WRF and other County-owned wastewater treatment facility's. An aerobic digestion system, consisting of one (1) digester, is used to biologically stabilize waste activated sludge (WAS) and scum from the biological treatment process, and other County-owned WWTP's by destroying the volatile solids in the mixture. This treatment further reduces odors and other nuisances prior to final disposal and reduces the volume of the biosolids. The aerobic digestion system design characteristics are presented below in Table 2.5-14.

Table 2.5-14: Aerobic Digestion System - Design Characteristics

Design Parameter	Units	Aerobic Digester Value
Diameter	feet	28
Sidewater Depth	feet	16
Volume	ft^3 (gallons)	9,852 (73,693)

A belt filter press (1.2 meter Ashbrook Winklepress) is utilized to dewater aerobically digested biosolids prior to final disposal. Dewatering reduces the volume and mass of the biosolids and makes handling and disposal of the biosolids easier. The biosolids are discharged from the belt filter press onto a portable belt-conveying unit that is used to fill the sludge hauling tractor-trailer(s).

Belt Filter Press Dewatering/Conveying System

The dewatered biosolids are then transported to Shelley's Environmental Systems in Zellwood, FL for further treatment and ultimate disposal.

2.5.1 Southwest Regional WRF Reclaimed Water Characteristics

The County is required to meet public access water quality criteria prior to conveying reclaimed water to the reclaimed water distribution system. Constituents of concern include $CBOD_5$, Total Suspended Solids (TSS), Fecal Coliforms, Total Residual Chlorine (TRC), pH, Total Nitrogen (TN) and Total Phosphorus (TP). Reclaimed water characteristics for various constituents are presented in Table 2.5-15 for Calendar Year 2022.

Table 2.5-15: SW Regional WRF Reclaimed Water Characteristics - 2022

Reclaimed Water Parameters	Permit Limitation (mg/L)		Reclaimed Water (mg/L)	
	Monthly Avg	Annual Avg	Max. Month	Annual Avg
Raw WW Flow	---	2.700	2.312	1.923
$CBOD_5$	30	20	2.1	1.4
TSS*	≤ 5		2.5	1.0
Fecal Coliforms	≤ 25/100 mL		< 1	< 1
TRC*	≥ 1.0		7.6	5.7
pH	6.0 - 8.5		7.60	7.34
TN	Report		4.9***	2.7***
NO_3-N**	12		2.5	1.4
TP	Report		0.6	0.2

* *At all times.*

** *Nitrate is only a limitation when effluent is disposed in the RIBs. This limitation is a single sample maximum.*

*** *Operational issue occurred in Dec 2022 leading to high effluent TN/TP conc.'s (not included in averages above)*

2.6 SW REGIONAL WRF RECLAIMED WATER DISTRIBUTION SYSTEM

Volusia County, as previously described, owns and operates a regional reclaimed water system for the beneficial reuse of the highly treated effluent from the Southwest Regional WRF. Reclaimed water is currently being used for public access spray irrigation of residential communities, golf courses, and effluent disposal through a system of Rapid Infiltration Basins (RIBs) at the following locations: (1) Southwest Regional WRF; (2) Deltona North WRF; (3) Terra Alta; and (4) Four Towns.

A summary of the current FDEP permitted reclaimed water/ effluent disposal sites and their capacities are presented in Table 2.6-1. Reclaimed water storage is located throughout the Southwest Regional WRF Wastewater Management Service Area as presented in Table 2.6-2.

Table 2.6-1: SW Regional WRF - Current Reclaimed Water / Effluent Disposal Sites			
Site	Area (acres)	Reclaimed Water/Effluent Disposal Capacity	
		(MGD)	(kgal/month)
Public Access Spray Irrigation			
DeBary Plantation Golf Course	88.0	0.240	7,300
Glen Abbey	80.0	0.310	9,429
Debary Golf and Country Club	86.0	0.300	9,125
Saxon Woods Subdivision	40.0	0.242	7,361
Springs and Park View/Reserve	69.0	0.269	8,182
Progress Energy Irrigation	12.1	0.050	1,521
SW Regional WRF - Site Irrigation	1.5	0.010	304
Orange City (wholesale)	---	0.600	18,250
Rivington Development	---	0.400	12,167
Spray Irrigation Disposal Capacity:	**376.6**	**2.421**	**73,639**
Rapid Infiltration Basin (RIB) System			
Four Towns RIB System	7.30	0.300	9,125
Southwest Regional WRF - RIB No. 1	1.90	0.300	9,125
Southwest Regional WRF - RIB No. 2	2.30	0.030	913
Terra Alta RIB System	3.75	0.100	3,042
Deltona North RIB System	2.54	1.599	48,636
RIB Disposal Capacity:	**17.79**	**2.329**	**70,840**
Total Facility Disposal Capacity:	**394.39**	**4.750**	**144,479**

Table 2.6-2: SW Volusia County - Reclaimed Water Storage Locations		
Reclaimed Water Storage Location	No. of Units	Total Storage Volume (MG)
Southwest Regional WRF Ground Storage Tank No. 1	1	3.0
Southwest Regional WRF Ground Storage Tank No. 2	1	1.5
DeBary Plantation Golf Course Storage Pond	1	2.0
SW Regional WRF - Rapid Infiltration Basins	2	2.0
Total Reclaimed Water Storage Capacity:	**5**	**8.5**

The current Public Access Reclaimed Water/Rapid Infiltration Basin (RIB) disposal capacity of the Southwest Regional WRF Wastewater Management System is 4.750 MGD AADF as seen from the information provided in Table 2.6-1 above. Thus, the SW Regional WRF has adequate disposal capacity as the Calendar Year 2022 raw wastewater flows are approximately 40.5% of the current reclaimed water/effluent disposal capacity.

2.7 SOUTHWEST REGIONAL WRF HISTORICAL FLOWS

Historical wastewater flows, including monthly ADF flows, three-month ADF flows and annual ADF flows, for the Southwest Regional WRF for the period between January 2015 and December 2022 are presented in Table 2.7-1. The average annual daily raw wastewater flow during Calendar Years 2021 and 2022 were 1.780 MGD and 1.923 MGD, respectively.

In addition, the above referenced Southwest Regional WRF historical flows (monthly ADF flows, three-month ADF flows and annual ADF flows) are plotted as a function of time and are presented in Figures 2.7-1 through 2.7-3, respectively.

A review of the historical raw wastewater flows (averages, maximum month, 3-month ADF average and AADF) to the Southwest Regional WRF, during the past five (5) years and in Calendar Year 2022, are synopsized below:

Raw Wastewater Flow Condition	SW Regional WRF Raw Wastewater Flow (MGD)	
	Calendar Years 2018 - 2022	Calendar Year 2022
Average Daily Flow	1.700	1.923
Maximum Day Flow	3.040	3.040
Minimum Day Flow	1.360	1.604
Monthly ADF Range	1.417 - 2.312	1.738 - 2.312
3-Month ADF Range	1.464 - 2.185	1.751 - 2.185
AADF Range (monthly rolling average)	1.516 - 1.922	1.782 - 1.922
% of Permitted Facility Capacity (ADF)*	**63.0%**	**71.2%**

* *Based on the current facility treatment capacity of 2.700 MGD AADF*

Table 2.7-1: Southwest Regional WRF - Historical Wastewater Flows

Month	Year	ADF (MGD)	3-Month ADF (MGD)	AADF (MGD)
JANUARY	2015	1.275	1.264	1.185
FEBRUARY	2015	1.326	1.294	1.191
MARCH	2015	1.398	1.333	1.205
APRIL	2015	1.416	1.380	1.218
MAY	2015	1.317	1.377	1.239
JUNE	2015	1.408	1.380	1.264
JULY	2015	1.429	1.385	1.289
AUGUST	2015	1.545	1.461	1.326
SEPTEMBER	2015	**1.570**	**1.515**	1.368
OCTOBER	2015	1.343	1.486	1.379
NOVEMBER	2015	1.410	1.441	1.393
DECEMBER	2015	1.281	1.345	**1.393**
JANUARY	2016	1.363	1.351	1.400
FEBRUARY	2016	1.395	1.346	**1.406**
MARCH	2016	1.367	**1.375**	1.404
APRIL	2016	1.326	1.363	1.396
MAY	2016	1.323	1.339	1.397
JUNE	2016	1.346	1.332	1.391
JULY	2016	1.342	1.337	1.384
AUGUST	2016	1.328	1.339	1.366
SEPTEMBER	2016	1.273	1.314	1.341
OCTOBER	2016	1.324	1.308	1.340
NOVEMBER	2016	1.325	1.307	1.333
DECEMBER	2016	**1.419**	1.356	1.344

Table 2.7-1: Southwest Regional WRF - Historical Wastewater Flows

Month	Year	ADF (MGD)	3-Month ADF (MGD)	AADF (MGD)
JANUARY	2017	1.380	1.375	1.346
FEBRUARY	2017	1.375	1.391	1.344
MARCH	2017	1.366	1.374	1.344
APRIL	2017	1.428	1.390	1.352
MAY	2017	1.438	1.411	1.362
JUNE	2017	1.501	1.456	1.375
JULY	2017	1.550	1.497	1.392
AUGUST	2017	1.597	1.550	1.415
SEPTEMBER	2017	1.722	1.623	1.452
OCTOBER	2017	**1.729**	**1.683**	1.486
NOVEMBER	2017	1.569	1.673	1.506
DECEMBER	2017	1.515	1.604	**1.514**
JANUARY	2018	1.525	1.536	1.526
FEBRUARY	2018	1.534	1.525	1.540
MARCH	2018	1.495	1.518	1.550
APRIL	2018	1.553	1.527	1.561
MAY	2018	1.542	1.530	1.569
JUNE	2018	1.594	1.563	1.577
JULY	2018	1.703	1.613	1.590
AUGUST	2018	**1.716**	1.671	**1.600**
SEPTEMBER	2018	1.598	**1.672**	1.589
OCTOBER	2018	1.503	1.606	1.571
NOVEMBER	2018	1.472	1.525	1.563
DECEMBER	2018	1.520	1.499	1.563

Table 2.7-1: Southwest Regional WRF - Historical Wastewater Flows

Month	Year	ADF (MGD)	3-Month ADF (MGD)	AADF (MGD)
JANUARY	2019	1.546	1.513	1.565
FEBRUARY	2019	1.533	1.533	1.565
MARCH	2019	1.502	1.527	**1.565**
APRIL	2019	1.491	1.509	1.560
MAY	2019	1.488	1.494	1.556
JUNE	2019	1.446	1.475	1.543
JULY	2019	1.599	1.511	1.535
AUGUST	2019	1.559	1.535	1.522
SEPTEMBER	2019	1.535	1.565	1.516
OCTOBER	2019	**1.619**	1.571	1.526
NOVEMBER	2019	1.572	1.575	1.534
DECEMBER	2019	1.538	**1.576**	1.536
JANUARY	2020	1.543	1.551	1.535
FEBRUARY	2020	1.529	1.536	1.535
MARCH	2020	1.503	1.525	1.535
APRIL	2020	1.417	1.483	1.529
MAY	2020	1.473	1.464	1.528
JUNE	2020	1.687	1.526	1.548
JULY	2020	1.709	1.623	1.557
AUGUST	2020	1.828	1.741	1.579
SEPTEMBER	2020	**2.053**	1.863	1.623
OCTOBER	2020	1.987	1.956	1.653
NOVEMBER	2020	1.882	**1.974**	1.679
DECEMBER	2020	1.751	1.873	**1.697**

Table 2.7-1: Southwest Regional WRF - Historical Wastewater Flows

Month	Year	ADF (MGD)	3-Month ADF (MGD)	AADF (MGD)
JANUARY	2021	1.709	1.781	1.711
FEBRUARY	2021	1.748	1.736	1.729
MARCH	2021	1.689	1.715	1.744
APRIL	2021	1.747	1.728	1.772
MAY	2021	1.705	1.714	1.791
JUNE	2021	1.764	1.739	1.798
JULY	2021	1.839	1.770	1.809
AUGUST	2021	**1.903**	1.835	**1.815**
SEPTEMBER	2021	1.862	**1.868**	1.799
OCTOBER	2021	1.818	1.861	1.785
NOVEMBER	2021	1.805	1.828	1.778
DECEMBER	2021	1.774	1.799	1.780
JANUARY	2022	1.740	1.773	1.783
FEBRUARY	2022	1.738	1.751	1.782
MARCH	2022	1.822	1.767	1.793
APRIL	2022	1.850	1.803	1.802
MAY	2022	1.848	1.840	1.814
JUNE	2022	1.792	1.830	1.816
JULY	2022	1.836	1.825	1.816
AUGUST	2022	1.903	1.844	1.816
SEPTEMBER	2022	2.080	1.940	1.834
OCTOBER	2022	**2.312**	2.098	1.875
NOVEMBER	2022	2.162	**2.185**	1.905
DECEMBER	2022	1.985	2.153	**1.922**

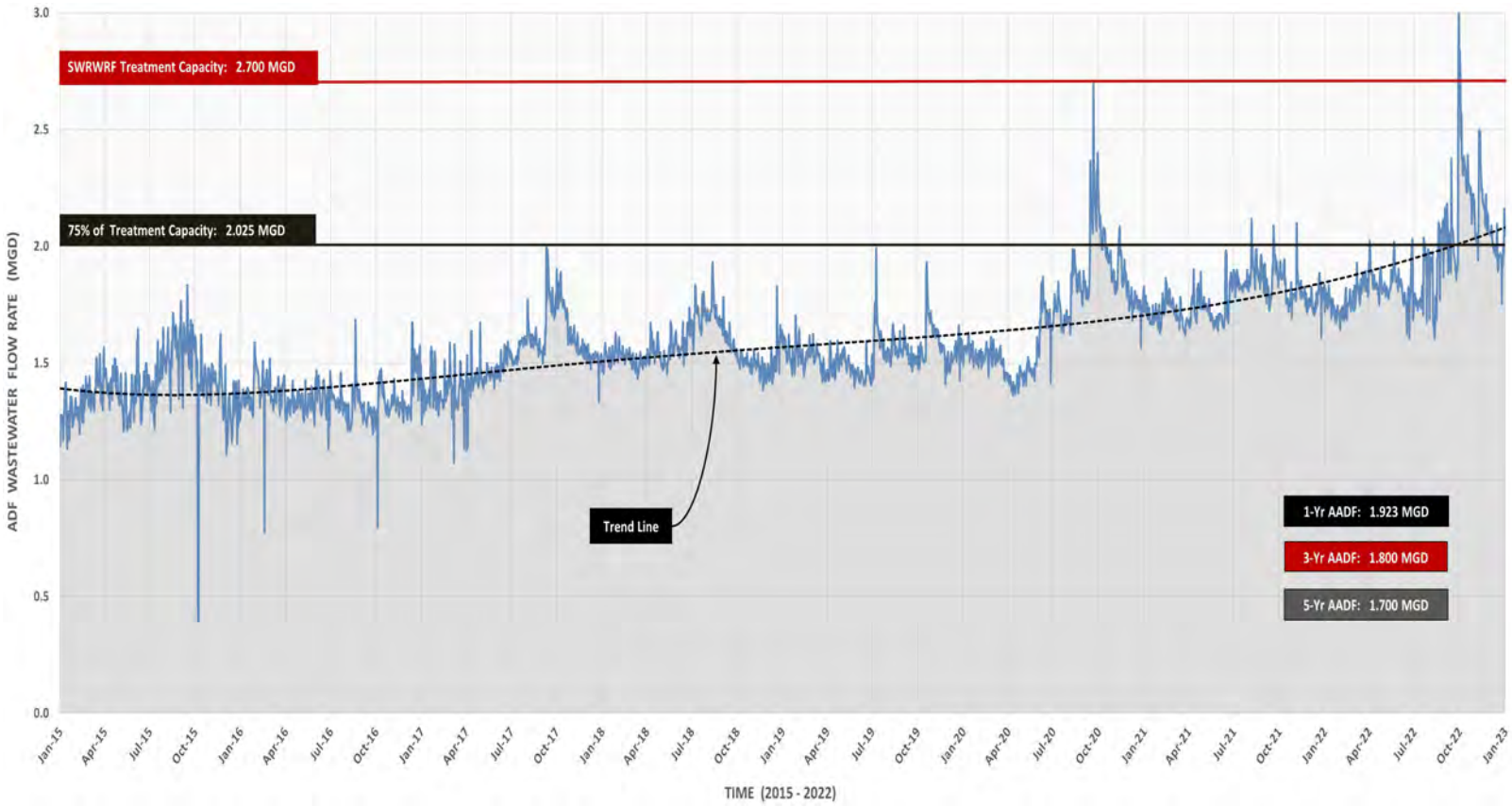


FIGURE 2.7-1 **SOUTHWEST REGIONAL WRF: HISTORICAL WASTEWATER FLOWS (ADF)**

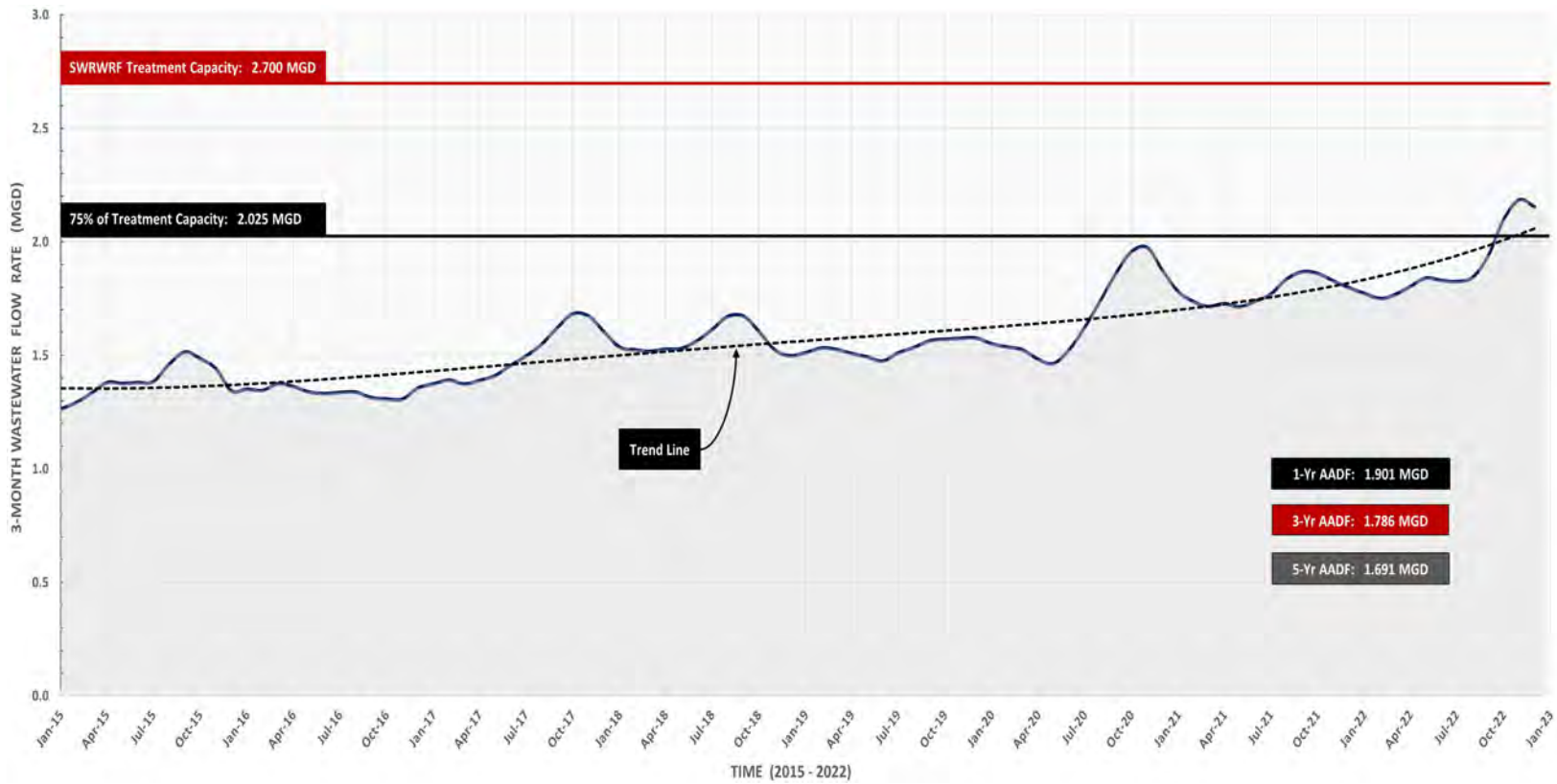


FIGURE 2.7-2 **SOUTHWEST REGIONAL WRF: HISTORICAL WASTEWATER FLOWS (3-MONTH ADF)**

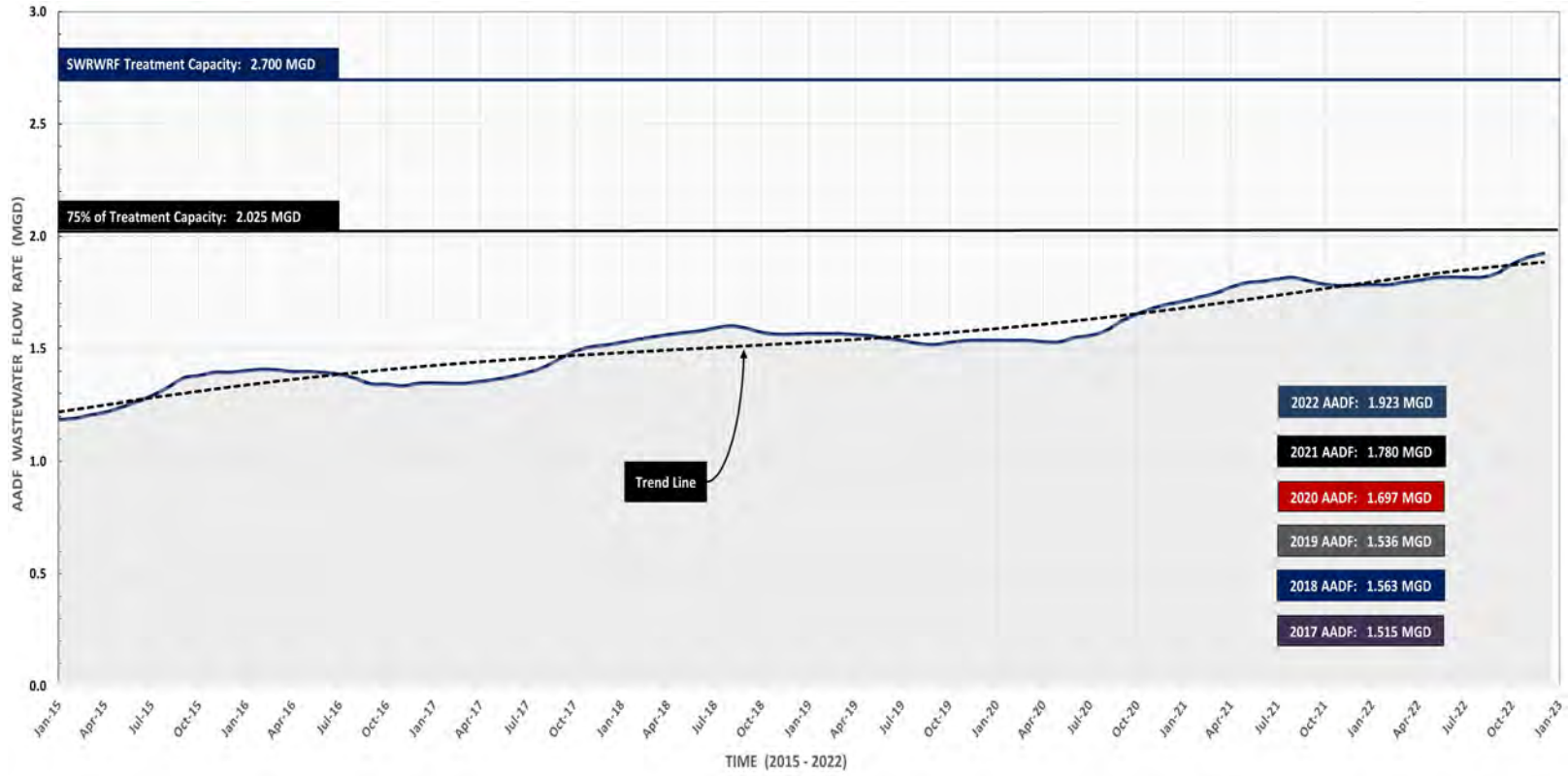


FIGURE 2.7-3 **SOUTHWEST REGIONAL WRF: HISTORICAL WASTEWATER FLOWS (AADF)**

The Southwest Regional WRF has been affected in the past by infiltration and inflow (I/I) during large storm events that occur within the service area. The County appropriates money on an annual basis, as required, to make wastewater collection system improvements throughout the service area.

Seasonal (annual) trends in raw wastewater flows experienced in the Southwest Regional Wastewater Management System, defined as the ratio of the three-month average daily flow to the annual average daily flow, are presented in tabular form in Table 2.7-2 and graphically in Figure 2.7-4 (Calendar Years 2015 - 2022).

Table 2.7-2: Southwest Regional WRF - Annual Variations in Flow

Year	Month of Year When the 3-Month ADF Was Maximum	Maximum 3-Month ADF (MGD)	AADF (MGD)	Ratio of Maximum 3-Month ADF for Year to Year AADF
2015	September	1.515	1.393	1.088
2016	March	1.375	1.344	1.023
2017	October	1.683	1.515	1.111
2018	September	1.672	1.563	1.070
2019	December	1.576	1.536	1.026
2020	November	1.974	1.697	1.163
2021	September	1.868	1.780	1.049
2022	November	2.185	1.923	1.136

It is evident from the data that the overall raw wastewater flows have been increasing over the last five (5) years; however, the annual variability in flow, as defined by the ratio of the maximum 3-month ADF for the year to the year's AADF, has been relatively consistent over the last five (5) calendar years. The possible reasons for the increase in raw wastewater flow since 2017, approximately 4.9%, include: growth within the Southwest Regional WRF service area, diversion of flows from the Four Towns WWTP and Deltona North WRF (decommissioned), and the Deltona Lakes (Fischer) WWTF.

An analysis of the Southwest Regional WRF raw wastewater flow distribution was conducted for Calendar Years 2016 - 2022 to evaluate the modulation and shifting of raw wastewater flows since 2016. The results of the analysis are presented graphically, per year, in Figures 2.7-5 - 2.7-12 and tabularized below in Table 2.7-3. The raw wastewater flow distribution analysis indicates the following:

- The majority of the raw wastewater flows received at the treatment facility have shifted from the 1.0 - 1.4 MGD flow range in 2015 to the 1.8 - 2.2 MGD flow range in 2022.

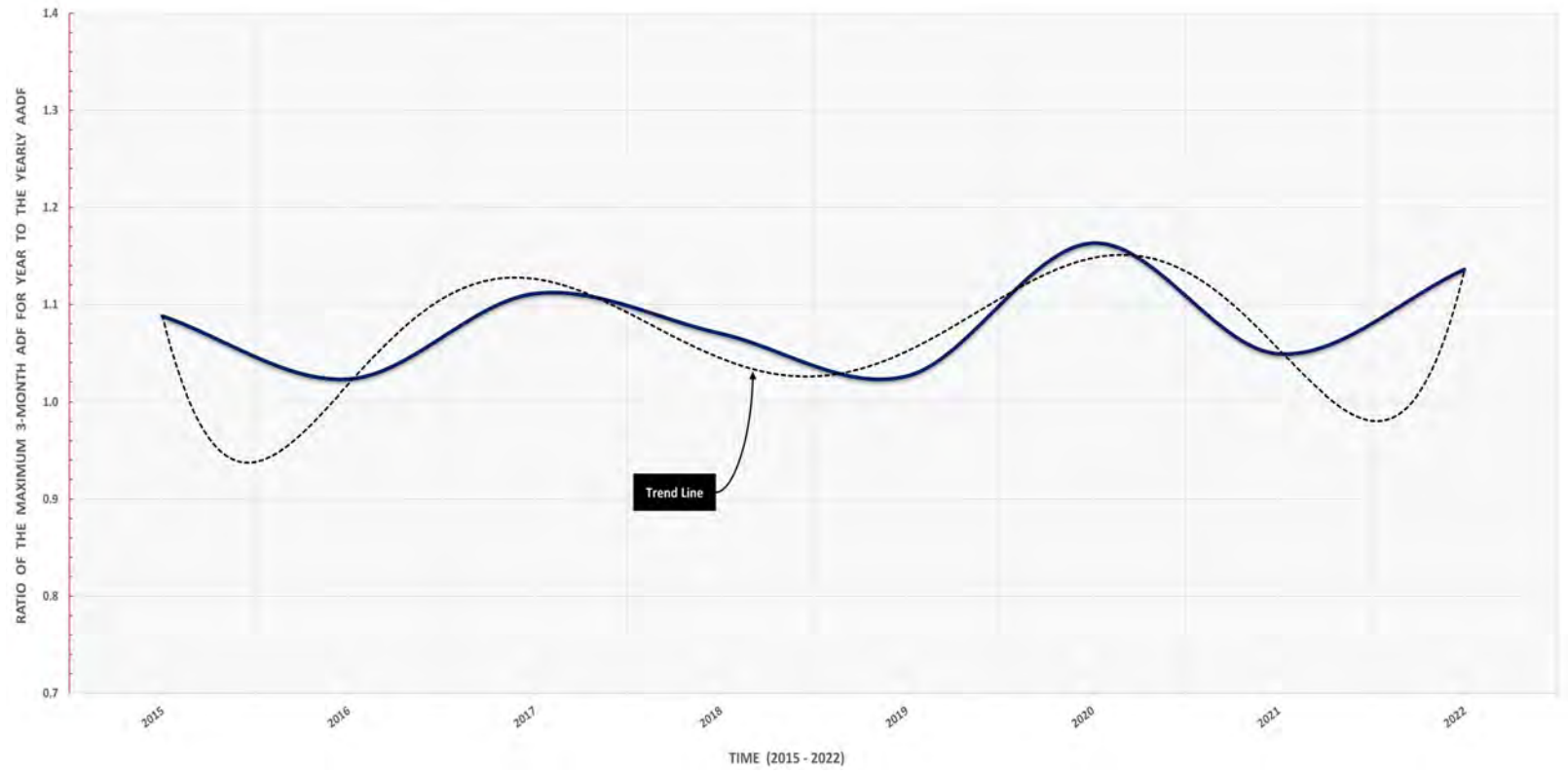


FIGURE 2.7-4 **SW REGIONAL WASTEWATER MANAGEMENT SYSTEM: ANNUAL VARIATIONS IN FLOW**

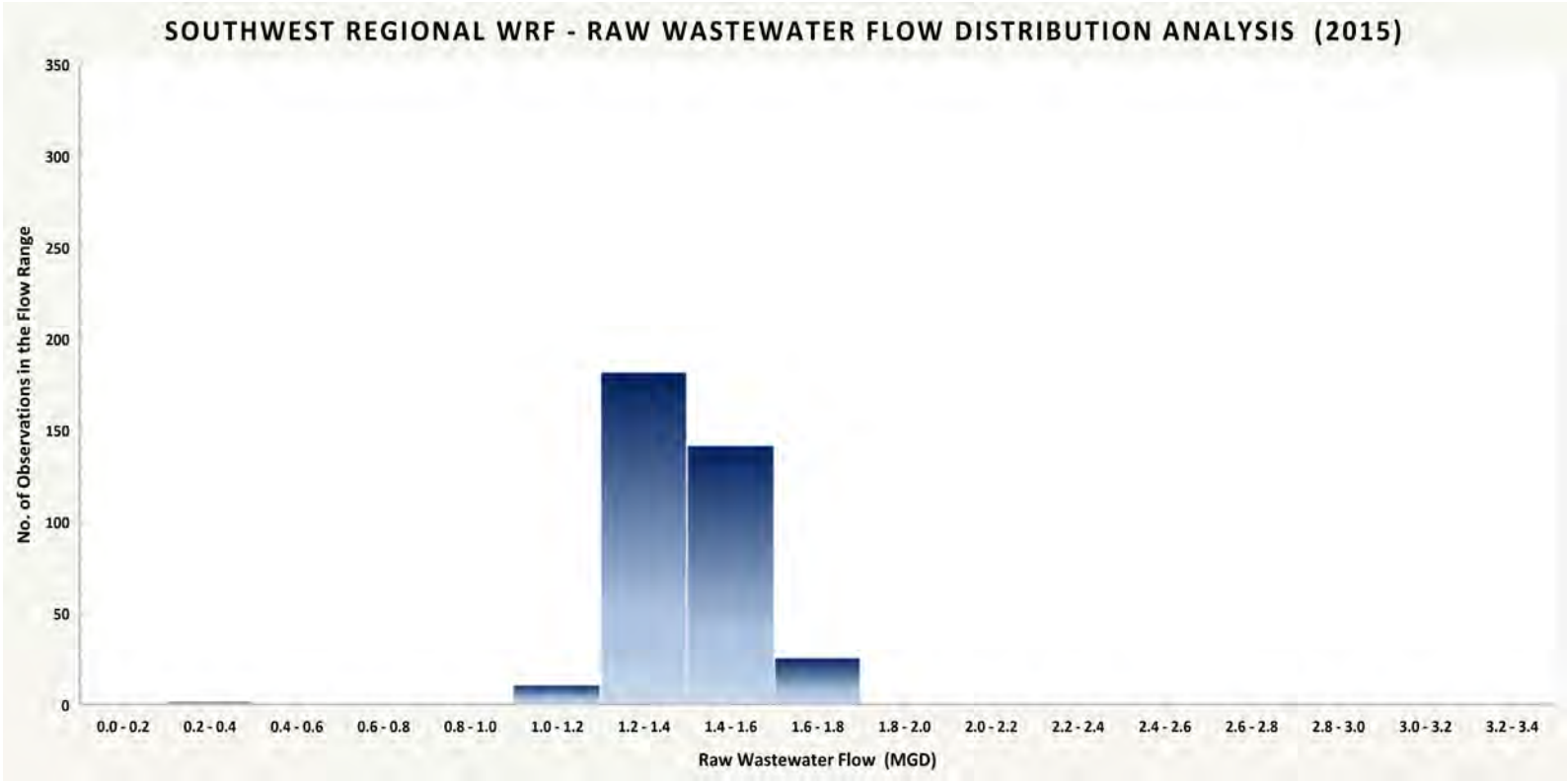


FIGURE 2.7-5 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2015)**

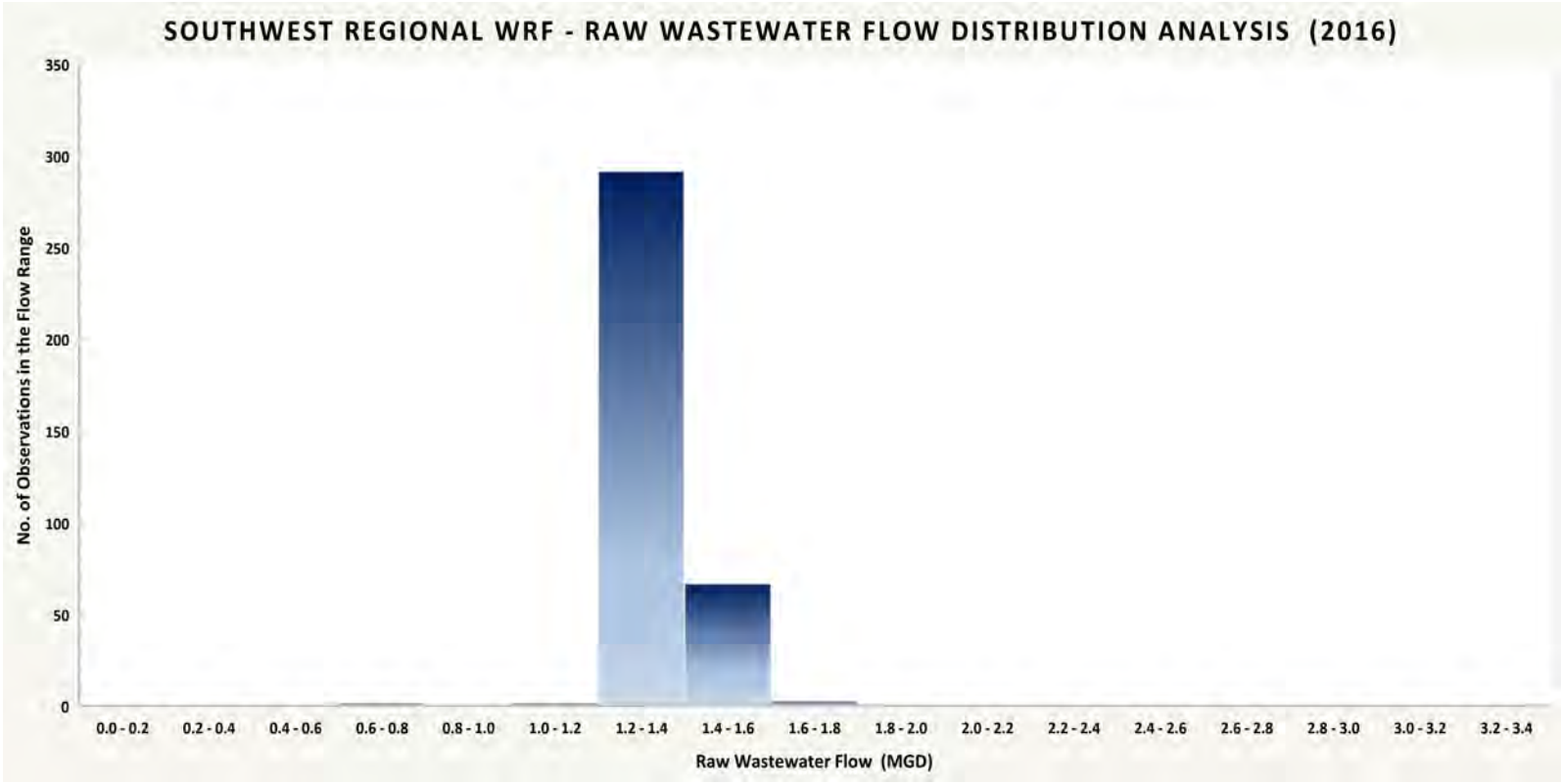


FIGURE 2.7-6 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2016)**

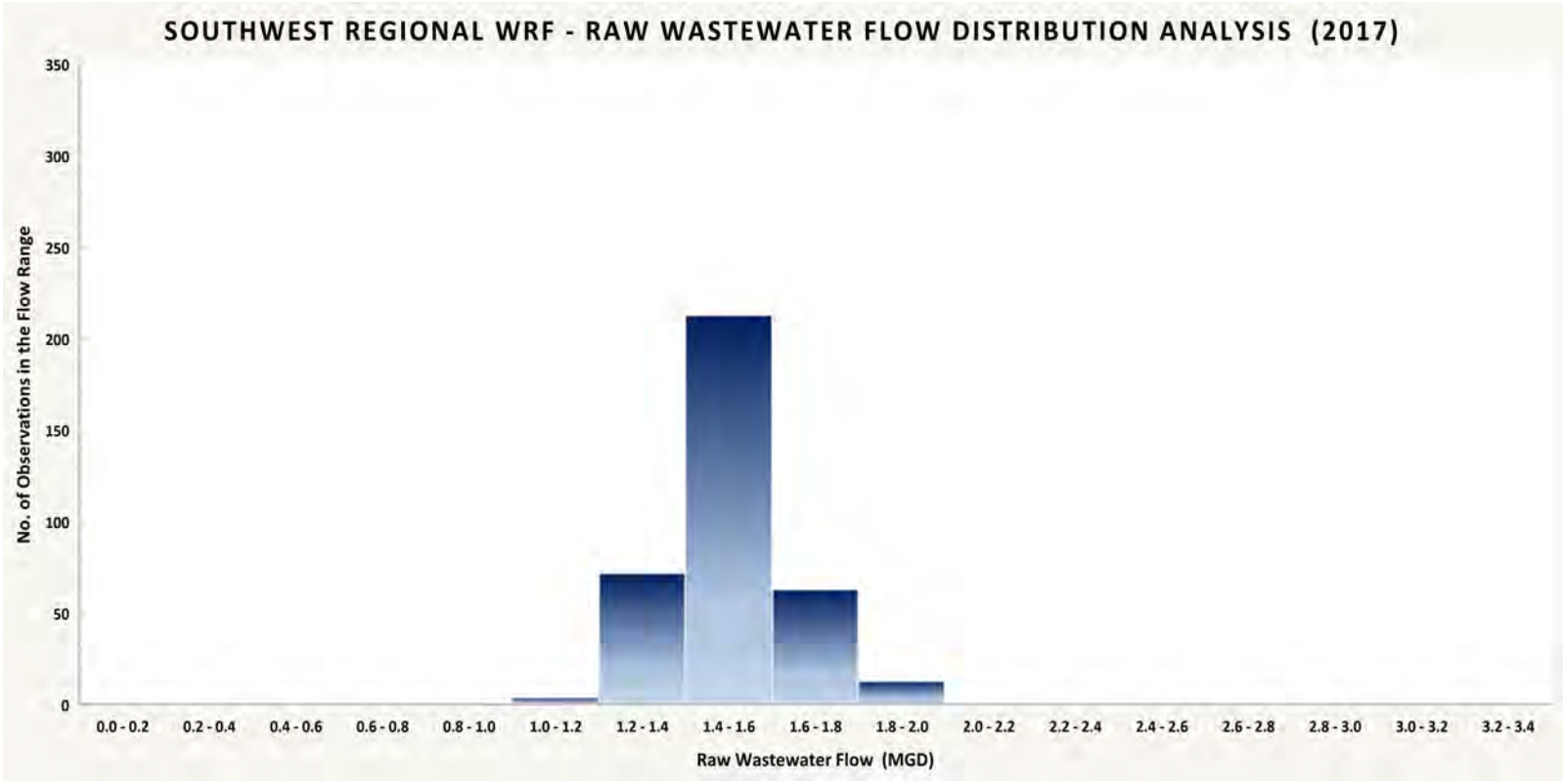


FIGURE 2.7-7 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2017)**

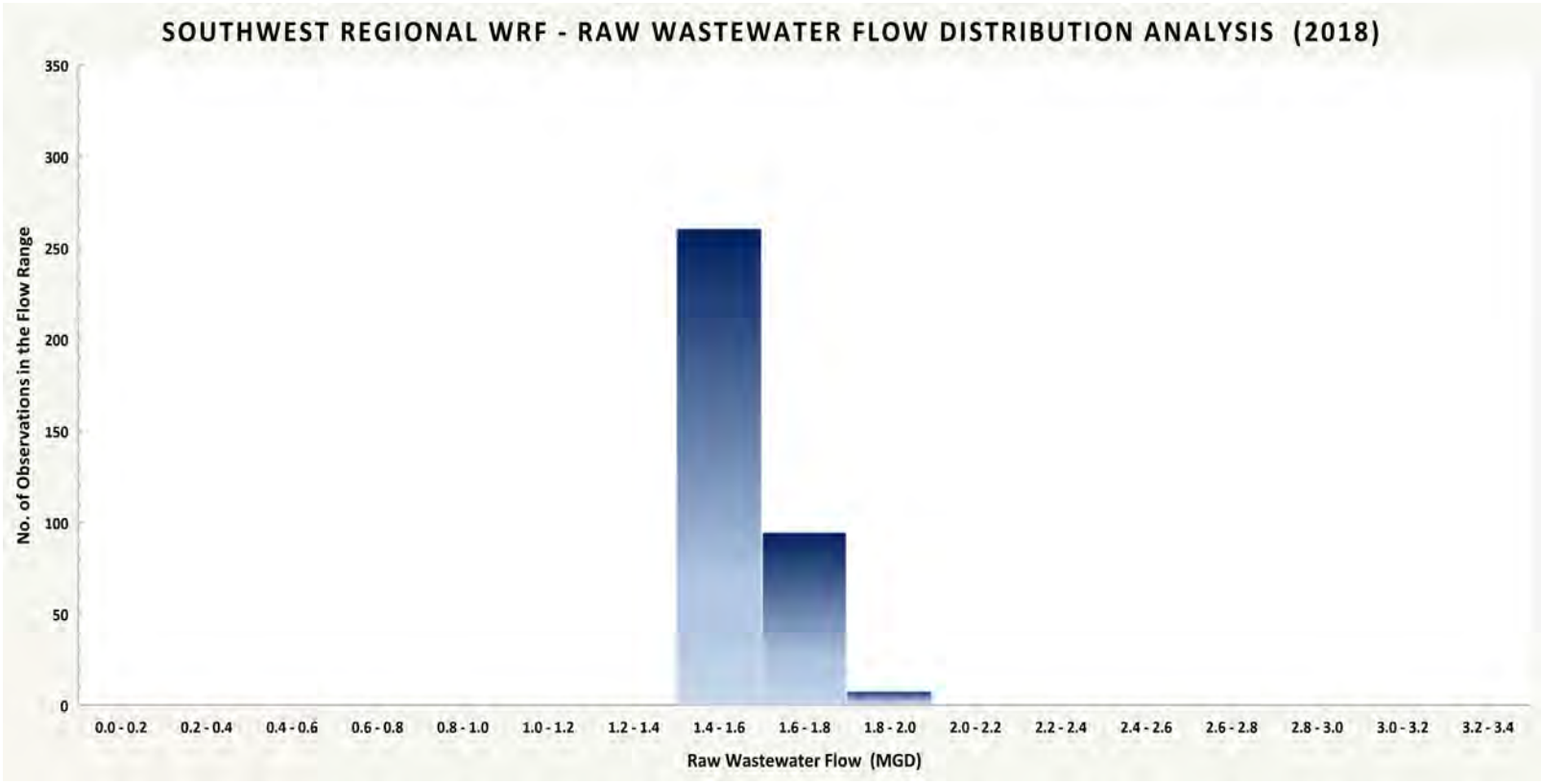


FIGURE 2.7-8 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2018)**

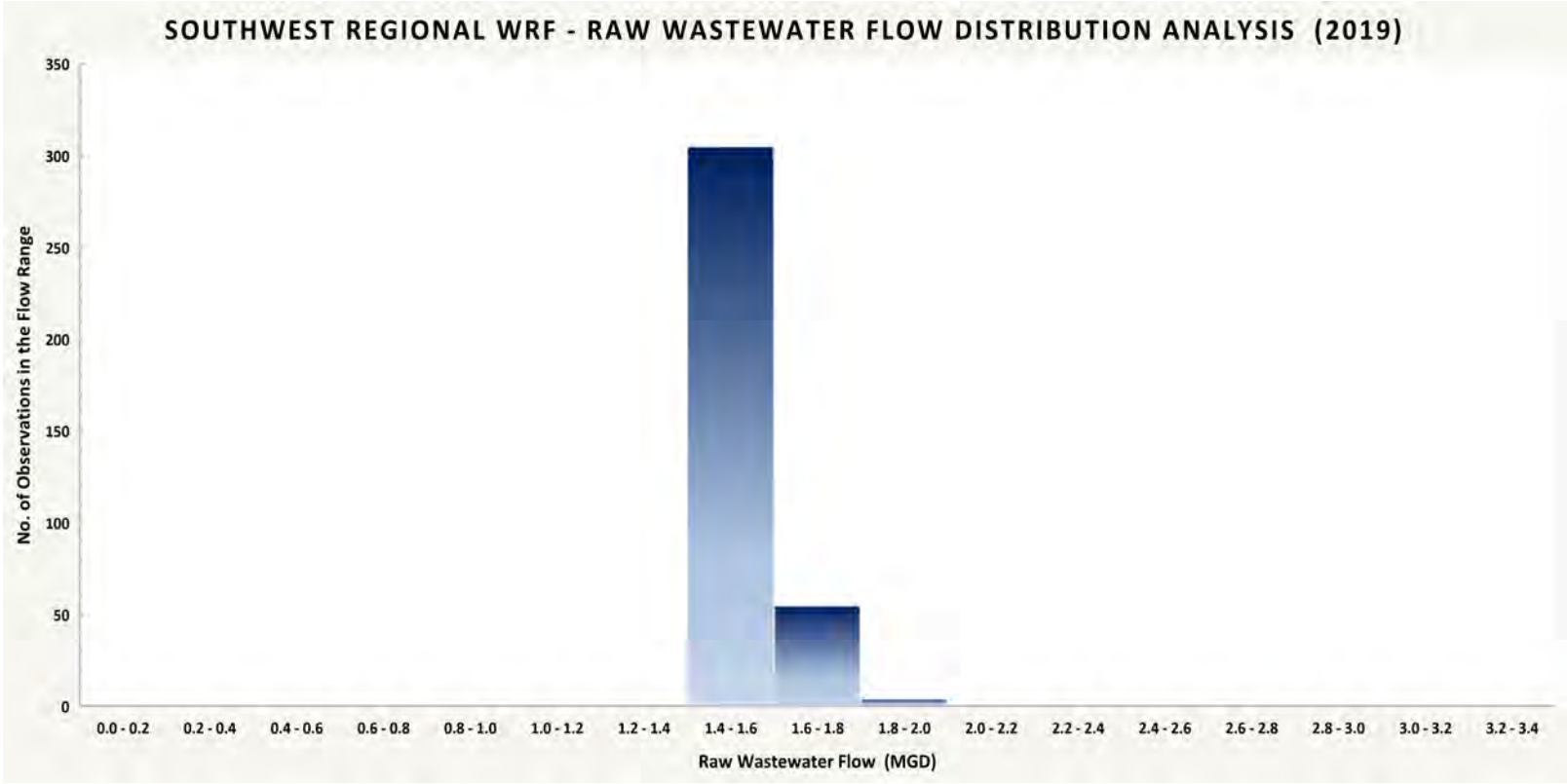


FIGURE 2.7-9 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2019)**

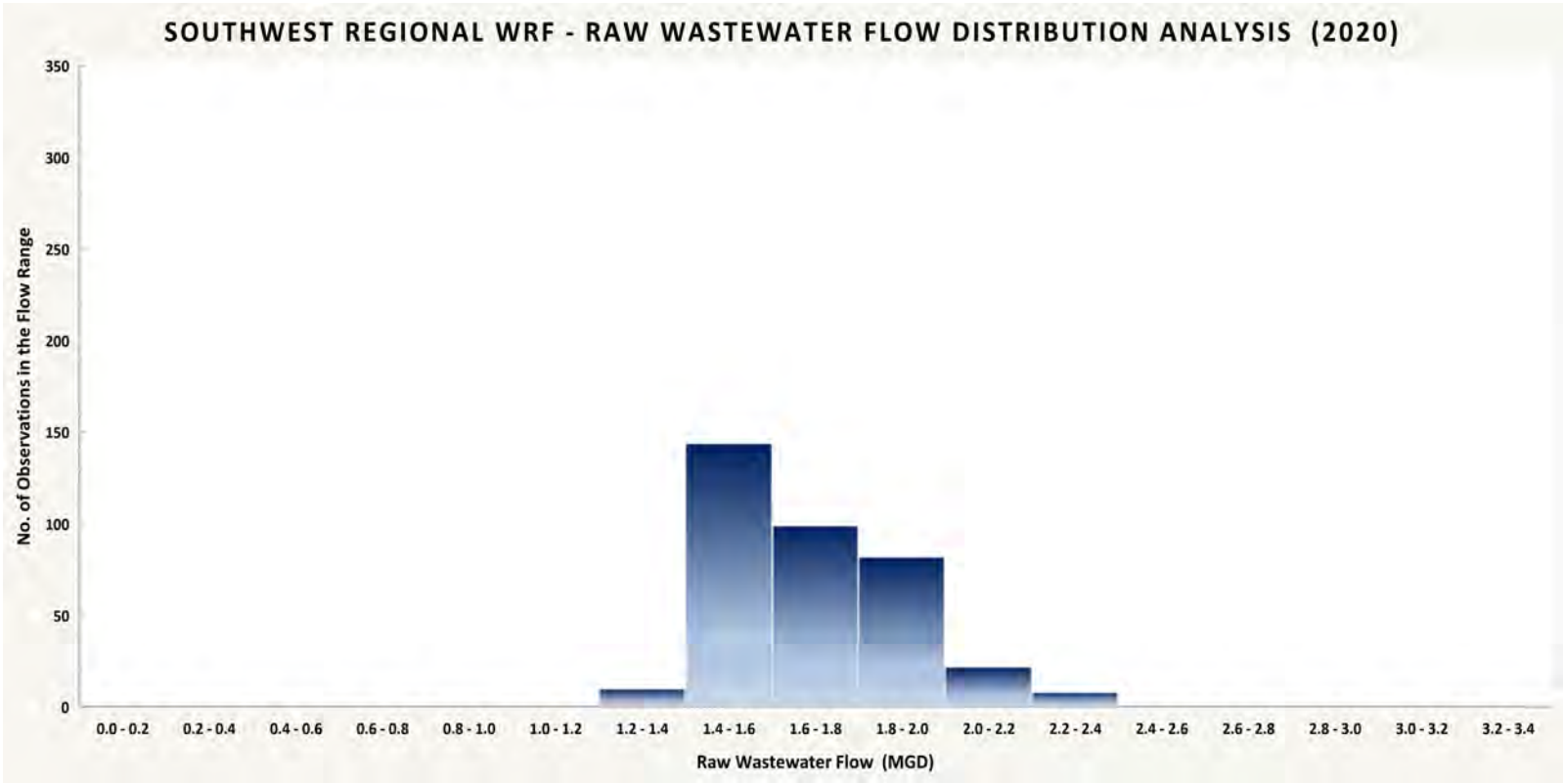


FIGURE 2.7-10 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2020)**

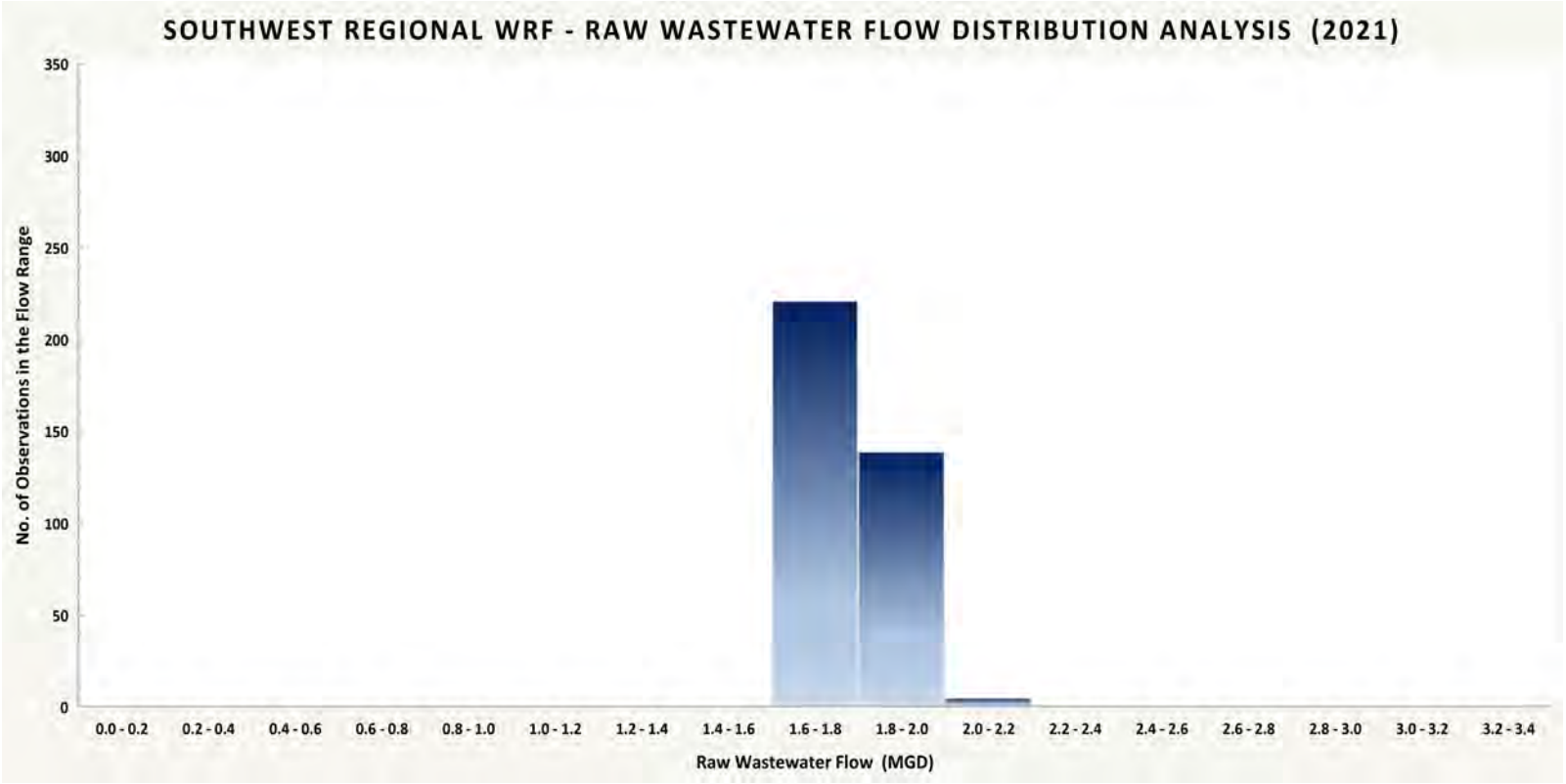


FIGURE 2.7-11 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2021)**

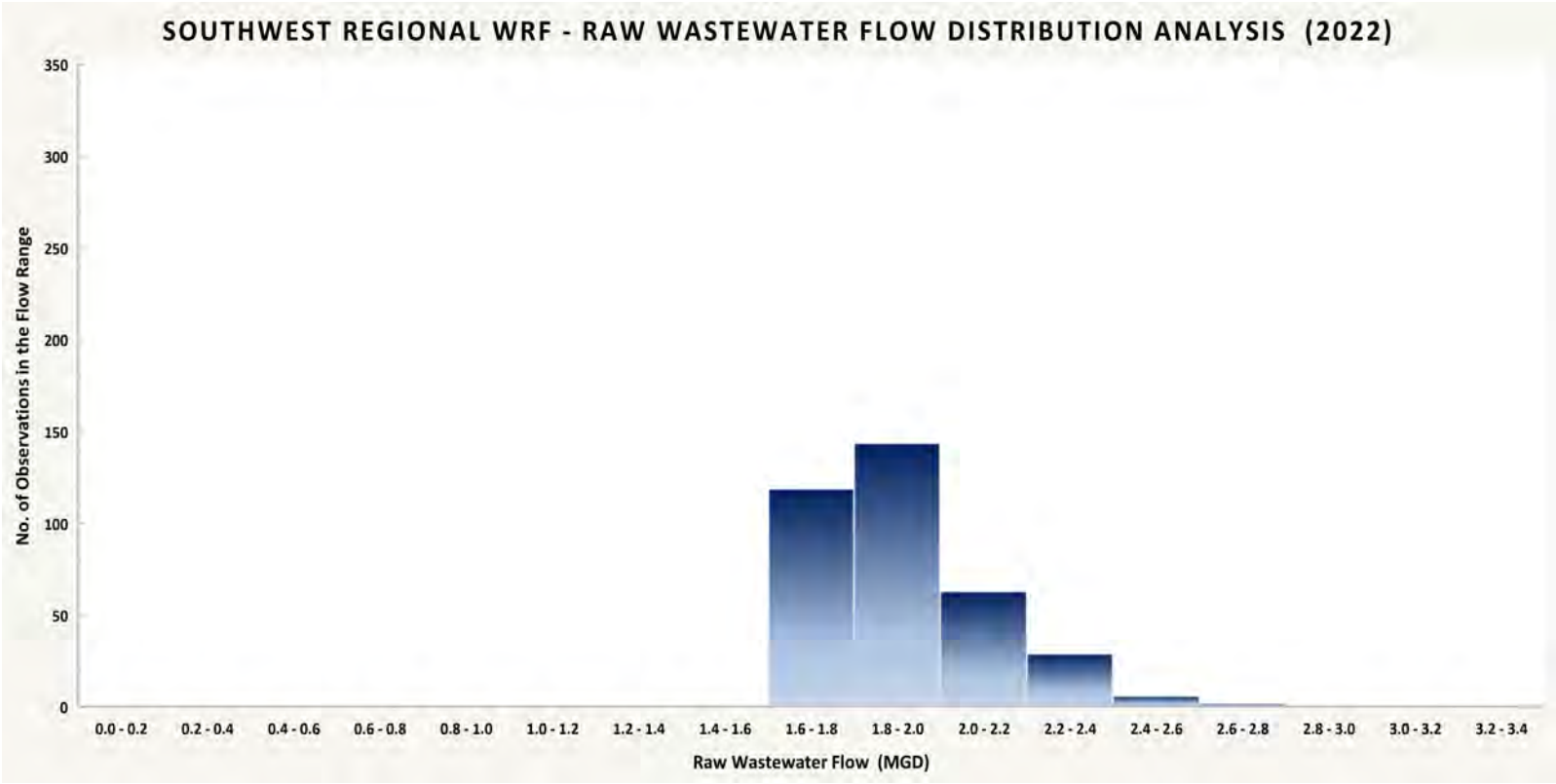


FIGURE 2.7-12 **SW REGIONAL WRF: RAW WASTEWATER FLOW DISTRIBUTION ANALYSIS (2022)**

WW Flow (MGD)	Table 2.7-3: Percentage of Wastewater Flow within the Identified Range							
	2015	2016	2017	2018	2019	2020	2021	2022
< 1.0	0.82%	0.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1.0 - 1.4	**52.88%**	**80.33%**	20.83%	0.27%	0.27%	2.73%	0.00%	0.00%
1.4 - 1.8	46.03%	19.13%	**75.62%**	**97.53%**	**98.64%**	**66.39%**	**60.55%**	32.60%
1.8 - 2.2	0.27%	0.00%	3.56%	2.19%	1.10%	28.42%	39.45%	**56.71%**
2.2 - 2.6	0.00%	0.00%	0.00%	0.00%	0.00%	2.19%	0.00%	9.59%
2.6 - 3.0	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.82%
> 3.0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%
Total:	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

- Flows exceeding 1.80 MGD accounted for 0.3% of the total flows received at the WRF in 2015. Flows exceeding 1.80 MGD accounted for 64.7% of the total flows received at the WRF in 2022.

- Flows exceeding 2.20 MGD accounted for 0% of the total flows received at the WRF in 2015. Flows exceeding 2.20 MGD accounted for 10.7% of the total flows received at the WRF in 2022.

- The flow distribution figures show the shifting of the distributions to the left and concentrating in the 1.80 - 2.20 MGD flow range. As previously discussed, this further reinforces the trend that the raw wastewater flows received at the Southwest Regional WRF has been increasing over the last five calendar years (~4.9%); thereby requiring the need to expand the wastewater treatment capacity of the treatment facility.

2.8 SW REGIONAL WRF - FLOW AND LOADING INFORMATION

The Southwest Regional WRF is classified as an *Advanced Wastewater Treatment plus Filtration Facility (Category I, Class B)*, utilizing the 5-Stage Bardenpho Process to treat the incoming wastewater from the service area and meets all Class I Reliability criteria. The facility is currently operating under FDEP Operations Permit No. FLA011128 and has a permitted disposal capacity of 4.750 MGD AADF. The facility produces a high-quality effluent that is low in nutrients and is used for slow-rate irrigation of public access reuse sites throughout the service area. The raw wastewater concentrations and flows utilized for the design of the facility's unit operations/processes are presented below in Table 2.8-1:

Table 2.8-1: Southwest Regional WRF - Design Influent Concentrations and Flows					
Condition	Flow (MGD)	Influent Concentrations (mg/L)			
		$CBOD_5$	TSS	TKN	TP
AADF	2.70	300	300	50	8
MDF	5.40	250	250	50	8
PHF	6.75				

The Southwest Regional WRF treatment system efficiencies, for Calendar Years 2021 and 2022, are presented below in Table 2.8-2:

Table 2.8-2: SW Regional WRF Treatment System Efficiency (2021 - 2022) *						
Parameter	Influent Conc. (mg/L)	Effluent Concentration		Parameter Removal (lb/day)	Percent Removal	
		(mg/L)	(lb/day)		Design	Actual
$CBOD_5$	256	1.9	29	3,929	95%	99.3%
TSS	223	1.0	16	3,427	95%	99.5%
TN**	50	2.4	37	736	94%	95.3%
TP**	8	0.3	4	120	87%	96.9%

* *AADF (2020 - 2021): 1.852 MGD*
** *Facility operational issue in Dec 2022 led to high effluent TN/TP concentrations (not included in TN/TP averages above)*

Raw wastewater flows and reclaimed water data for Calendar Years 2021 and 2022 at the Southwest Regional WRF are presented in Table 2.8-3. ***The facility has been functioning efficiently meeting the effluent limitations required*** by the current FDEP Operations Permit during this period as indicated in the aforementioned table. All current operational loadings on the unit operations and processes at the Southwest Regional WRF are within the normal loading rates that were used to establish the design capacity for the Southwest Regional WRF.

2.9 REUSE FACILITIES

As discussed previously, the Southwest Regional WRF's Wastewater Management Plan is a program of water reuse. The wastewater treatment system is designed to produce a highly-treated wastewater effluent. The reclaimed water, following the reclamation process,

Table 2.8-3: Southwest Regional WRF - Reclaimed Water Quality (2021 - 2022)

Month/ Year	Raw Wastewater Flow Rate (MGD)	Reclaimed Water Flow Rate (MGD)	Reclaimed Water Quality Parameters					
			TRC (mg/L)	$CBOD_5$ (mg/L)	TSS (mg/L)	pH (S.U.)	TN (mg/L)	TP (mg/L)
Jan 2021	1.709	1.262	3.6	2.9	0.6	7.24	1.9	0.3
Feb 2021	1.748	1.205	4.3	1.0	0.9	7.24	0.6	0.3
Mar 2021	1.689	1.528	3.5	2.8	1.4	7.15	2.1	0.5
Apr 2021	1.747	1.725	2.4	2.3	1.1	6.99	1.8	0.3
May 2021	1.705	1.849	3.6	3.2	0.8	7.21	1.3	0.2
Jun 2021	1.764	1.629	3.1	3.3	1.0	7.14	1.3	1.0
Jul 2021	1.839	1.522	4.3	2.2	2.0	7.06	1.6	0.1
Aug 2021	1.903	1.488	4.0	1.2	0.8	7.15	2.0	0.6
Sep 2021	1.862	1.590	5.3	2.5	0.6	7.17	3.1	0.1
Oct 2021	1.818	1.651	6.3	4.3	1.2	7.18	2.5	0.4
Nov 2021	1.805	1.395	6.2	2.3	0.9	7.11	3.8	0.1
Dec 2021	1.774	1.357	5.2	1.4	0.9	7.31	3.1	0.1
SWRWRF Average - 2021	**1.780**	**1.517**	**4.3**	**2.4**	**1.0**	**7.16**	**2.1**	**0.3**

Table 2.8-3: Southwest Regional WRF - Reclaimed Water Quality (2021 - 2022)

Month/ Year	Raw Wastewater Flow Rate (MGD)	Reclaimed Water Flow Rate (MGD)	Reclaimed Water Quality Parameters					
			TRC (mg/L)	$CBOD_5$ (mg/L)	TSS (mg/L)	pH (S.U.)	TN (mg/L)	TP (mg/L)
Jan 2022	1.740	1.419	7.6	1.0	1.0	7.60	2.1	0.2
Feb 2022	1.738	1.576	6.4	1.0	1.0	7.47	2.1	0.1
Mar 2022	1.822	1.436	6.4	1.0	0.9	7.33	1.4	0.3
Apr 2022	1.850	1.569	6.4	1.7	1.4	7.38	3.2	0.2
May 2022	1.848	1.528	5.4	2.1	0.9	7.27	2.1	0.1
Jun 2022	1.792	1.462	5.1	1.8	1.1	7.34	2.6	0.6
Jul 2022	1.836	1.384	5.8	1.3	0.9	7.45	4.9	0.1
Aug 2022	1.903	1.397	6.0	1.3	0.5	7.39	2.2	0.1
Sep 2022	2.080	1.000	5.8	1.4	0.5	7.30	2.9	0.1
Oct 2022	2.312	1.263	5.0	1.0	0.6	7.15	2.5	0.1
Nov 2022	2.162	1.348	4.0	1.8	1.2	7.25	3.5	0.2
Dec 2022*	1.985	1.319	4.2	1.0	2.5	7.16	11.7	0.8
SWRWRF Average - 2022	**1.922**	**1.392**	**5.7**	**1.4**	**1.0**	**7.34**	**2.7**	**0.2**

* *Facility operational issue in Dec 2022 led to high effluent TN/TP concentrations (not included in TN/TP averages above)*

is distributed throughout the planning area and utilized for spray irrigation on public access sites such as the Debary Golf Course, residential neighborhoods as well as a system on-site and off-site Rapid Infiltration Basins (RIBs).

The reclaimed water distribution system consists of miles of distribution piping (ductile iron and PVC) looped throughout the service area, with isolation valves, to deliver reclaimed water from the Southwest Regional WRF to various spray irrigation sites and Rapid Infiltration Basins, as indicated herein. The distribution system is designed for future effluent disposal by expansion or tie-ins to the distribution system to enable spray irrigation of private residences, public property, and other regional sites. As previously indicated, there is approximately 8.5 millions gallons of reclaimed water storage located throughout the Southwest Regional WRF wastewater management system service area.

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SECTION 3

FUTURE CONDITIONS

3.1 GENERAL CONDITIONS

The Southwest Regional WRF Wastewater Management System Service Area includes the residential, agricultural, rural and commercial portions of southwest Volusia County. The growth within the Southwest Regional WRF Wastewater Management System Service Area, during the period from 2000 - 2008, was moderate and was expected to continue due to the general desirability of the Central Florida area. As growth continued, the demand for wastewater collection and transmission system improvements, wastewater treatment facility improvements, and reclaimed water distribution system improvements was required. The growth slowed considerably from 2009 - 2015 due to the financial instability in the economy. The residential and commercial construction trends have been in flux during the past couple of years and all signs were indicating that the economy was beginning to recover as residential construction in the area had picked up slightly. However, the impact of the COVID-19 pandemic, inflation in the economy, supply chain issues, energy issues, a potential impending recession, and the costs of materials, labor and commodities, on the timing of future growth in the area is unknown.

As the economy begins to pick up and growth occurs, the Deltona North WRF wastewater flows are transferred to the SW Regional WRF (2023), the City of Deltona contemplates sending the Fisher WWTF wastewater flows to the SW Regional WRF, and the State of Florida potentially begins requiring septic tank owners in the Blue Spring area to connect to the Southwest Regional WRF (estimated at 5,000 septic tanks), the demand for collection and transmission system improvements, wastewater treatment facility improvements, and reclaimed water distribution system improvements will be required.

3.2 INTRODUCTION AND METHODOLOGY

This Section of the Capacity Analysis Report provides an estimate of projected future wastewater generation rates for the Southwest Regional WRF Wastewater Management System Service Area. Historical raw wastewater flows for the Southwest Regional WRF Wastewater Management System were utilized in the analysis. Wastewater flow rates were projected to Design Year 2042 using this data and anticipated rates of growth in the local area.

The current population within the service area is estimated to be 13,800. Population data was obtained from the Volusia County Utilities Department (VCUD), Florida Housing Data Clearinghouse and the U.S. Census Bureau.

3.3 SWRWRF WASTEWATER MANAGEMENT SYSTEM SERVICE AREA

The Southwest Regional WRF Wastewater Management System Service Area includes land within the southwest portion of Volusia County. The service area is generally bordered by Shady Lane on the north, the St. Johns River on the west and south, and Interstate 4 on the east. The raw wastewater generated within the service area is collected and conveyed via gravity sewers, lift stations and forcemains to the Southwest Regional WRF for advanced treatment and the production of a high-quality commodity, *reclaimed water*. Land use within the SW Regional WRF service area consists of the following:

Single Family	Mobile Home	Rural	Commercial
Multi-Family	Agricultural	Hotel/Motel	Light Industrial

3.4 WASTEWATER FLOW PROJECTIONS

3.4.1 General

One of the first steps in the development of a wastewater management system is the determination of design wastewater generation rates for various usage classifications. Different zoning categories produce varying wastewater flows (residential, commercial, industrial and infiltration/inflow).

Typical design values for wastewater production are found in most wastewater engineering textbooks, and environmental engineering and EPA Design Manuals. Additionally, municipalities and counties may have historic site specific wastewater flow information. Sources evaluated to develop the design wastewater flow rates and verify the historical per capita wastewater flow for the Southwest Regional WRF Wastewater Management System Service Area are presented below.

A. ***Wastewater Engineering: Treatment and Resource Recovery*** *(5th Edition, Metcalf & Eddy, 2014)* presents various tables that list wastewater flow rates from different sources. In general, typical flows from individual residences vary from 50 - 89 gallons/person-day (gpcd), depending on the type of residence. A flowrate of 66 gpcd is presented as an expected value from an average home. The text also indicates a typical flow of 140 gallons/unit-day from a mobile home

and 70 gpd/guest from a hotel. However, motels with and without kitchenettes generate a normal flow of 60 gpd/unit and 55 gpd/unit, respectively.

This reference also states that 60 - 90% of the per capita water consumption becomes wastewater; thereby generating between 90 and 135 gpcd.

Wastewater production from various commercial, institutional, industrial and recreational facilities is also provided. The format for the majority of this data is too site specific to be useful for the analysis herein, but, some generalized flowrates are presented. Typical design flow allowances are:

Use	Typical Design Flow (gpd/acre)
Commercial Districts	800 - 1,500
Industrial Areas (light)	1,000 - 1,500

For the Southwest Regional WRF Wastewater Management System Service Area, waste loads from light industrial zoned areas will be from domestic type uses and the projections reflect the growth that is assumed to occur in this sector as the region develops. The County has an approved Industrial Waste Pretreatment Program (IWPP) in place to minimize and control the quantities of unwanted pollutants discharged into their wastewater collection system.

B. ***Elements of Water Supply and Wastewater Disposal*** *(2nd Edition, Fair, Geyer & Okun, 1971)* also presents generalized wastewater flow data. This reference states the following:

- 60 - 70% of the potable water used by residential dwellings is converted into wastewater.
- The overall average daily water consumption is 150 gpcd. Therefore, the wastewater production ranges from 90 - 105 gpcd.
- Commercial areas generate average daily wastewater flows of 300 - 2,000 gallons/acre-day.

C. ***Water Supply and Pollution Control*** *(8th Edition, Viessmann, Hammer, Perez and Chadik, 2009)* states that typically 60 - 75% of the potable water consumed in a residence becomes wastewater.

D. ***Design and Construction of Sanitary and Storm Sewers*** *(WEF MOP No. 9, ASCE MOP No. 37)* estimates a wastewater generation rate of 14,000 gpd/acre in industrial zoned areas.

E. ***Great Lakes/Upper Mississippi River Board of Sanitary Engineers, 2014 Edition (Ten States Standards for Wastewater Facilities)*** requires treatment facilities with new wastewater collection systems to be designed based on an average daily per capita wastewater flow of not less than 100 gpcd. For existing wastewater collection systems, the design is to be based on *actual flow* data to the extent possible.

F. ***Southwest Regional WRF Wastewater Management System Service Area Records***. The historical flow records of the Southwest Regional WRF Wastewater Management System Service Area were evaluated, during the most recent five-year flow period. The average per capita wastewater flow of 100 gallons per day (100 gpcd) was used as the basis for wastewater flow projections in addition to a population density of 2.3 capita per dwelling.

The wastewater flow projections for the 20-year planning horizon are based on the governing criteria of the Florida Administrative Code, Chapter 62-604, *Collection and Transmission Facilities*, which has adopted, by reference, the Great Lakes/Upper Mississippi River Board of Sanitary Engineers - Ten States Standards, historical flows, and County wastewater flow data.

3.4.2 Historical Annual Variations in Wastewater Flow

The historical annual variations in wastewater flow at the Southwest Regional Wastewater Management System Area, during the most recent five-year flow period (Calendar Years 2018 - 2022) are presented below.

Calendar Year	AADF (MGD)	Max Month Flow (MGD)	Maximum 3-Month ADF		Maximum 3-Month ADF to AADF	Maximum Month Peaking Factor
			Month	Flow (MGD)		
2018	1.563	1.716	September	1.672	1.070	1.098
2019	1.536	1.619	December	1.576	1.026	1.054
2020	1.697	2.053	November	1.974	1.163	1.210
2021	1.780	1.903	September	1.868	1.049	1.069
2022	1.923	2.312	November	2.185	1.136	1.202
Five Year Average Flow Ratios/Factors:					**1.089**	**1.127**

The ratio of the maximum 3-month ADF to AADF averaged 1.089 and was found to be in a very narrow range over the five-year period (1.026 - 1.163). Likewise, the

maximum month peaking factor averaged 1.127 and was also found to be in a vary narrow range over the five-year period (1.054 - 1.210). The higher values in the two ratios in 2022 were due to the excessive rainfall and infiltration/inflow due to Hurricanes Ian and Nicole.

3.4.3 Design Average Daily Wastewater Flows

Design raw wastewater flows (AADF) were generated for the Southwest Regional Wastewater Management System Service Area based on the following:

Flow Projection Assumptions	Values
Average per capita wastewater flow	100 gallons/capita-day
Population Density	2.3 capita/dwelling
Estimated number of septic tanks in the SW Regional WRF service area	5,000
Anticipated increase in wastewater flows (non-septic tank) through 2026	2.00%
Anticipated increase in wastewater flows (non-septic tank): 2027- 2031	1.75%
Anticipated increase in wastewater flows (non-septic tank): 2032- 2036	1.50%
Anticipated increase in wastewater flows (non-septic tank) after 2036	1.25%
Design Year when the Deltona North WRF raw wastewater flows will be transferred to the SW Regional WRF for treatment	2023
Design Year when the Deltona - Fisher WWTF wastewater flows are assumed to be transferred to the SW Regional WRF for treatment	2025 - 2027
No. of Years to connect all septic tanks to the SW Regional WRF	20 (250 connections/year)
Design Year to begin disconnecting septic tanks and sending flow to the Southwest Regional WRF	2026

Raw wastewater flow projections for the Southwest Regional WRF Wastewater Management System Service Area, through Design Year 2042, are presented in a tabular format in Table 3.4-1 and graphically in Figure 3.4-1.

The wastewater flow projections indicate a raw wastewater flow of 4.539 MGD AADF in Design Year 2042. The County has contracts with CPH, LLC to design the expansion of the Southwest Regional WRF to approximately 5.500 MGD AADF and Wharton-Smith, Inc. to construct the new facility improvements through the CMAR delivery method. The improvements should be on-line in Calendar Year 2025 thereby allowing the Southwest Regional WRF to accept flows from the Deltona Fisher WWTF and from the potential abandonment of septic tanks in the service area.

Table 3.4-1: Southwest Regional WRF Wastewater Management System - Wastewater Flow Projections

Design Year	SWRWRF Raw Wastewater Flow - AADF (MGD)	Deltona North WRF Flow Transfer - AADF (MGD)*	Septic Tank Flow - AADF (MGD)**	City of Deltona Fisher WWTF Flow Transfer AADF (MGD)***	Total Wastewater Flow Projection - AADF (MGD)
2022	1.923				1.923
2023	1.961	0.260			2.221
2024	2.001	0.265			2.266
2025	2.041	0.271		0.200	2.511
2026	2.082	0.276	0.058	0.204	2.619
2027	2.118	0.281	0.116	0.458	2.972
2028	2.155	0.286	0.174	0.466	3.080
2029	2.193	0.291	0.232	0.474	3.189
2030	2.231	0.296	0.290	0.482	3.299
2031	2.270	0.301	0.348	0.490	3.410
2032	2.304	0.305	0.406	0.498	3.513
2033	2.339	0.310	0.464	0.505	3.618
2034	2.374	0.315	0.522	0.513	3.723
2035	2.409	0.319	0.580	0.521	3.829
2036	2.446	0.324	0.638	0.528	3.936
2037	2.476	0.328	0.696	0.535	4.035
2038	2.507	0.332	0.754	0.542	4.135
2039	2.538	0.336	0.812	0.548	4.235
2040	2.570	0.341	0.870	0.555	4.336
2041	2.602	0.345	0.928	0.562	4.437
2042	2.635	0.349	0.986	0.569	4.539

* *New Master Lift Station constructed at the Deltona North WRF and raw wastewater flows shall be transferred, over time, to the Southwest Regional WRF for treatment*

** *200 septic tanks per year connected to the SW Regional WRF at a WW generation rate of 230 gpd/dwelling.*

*** *Potential transfer of Deltona Fisher WWTF flows (50% of WW flow in 2025 and the remainder in 2027).*

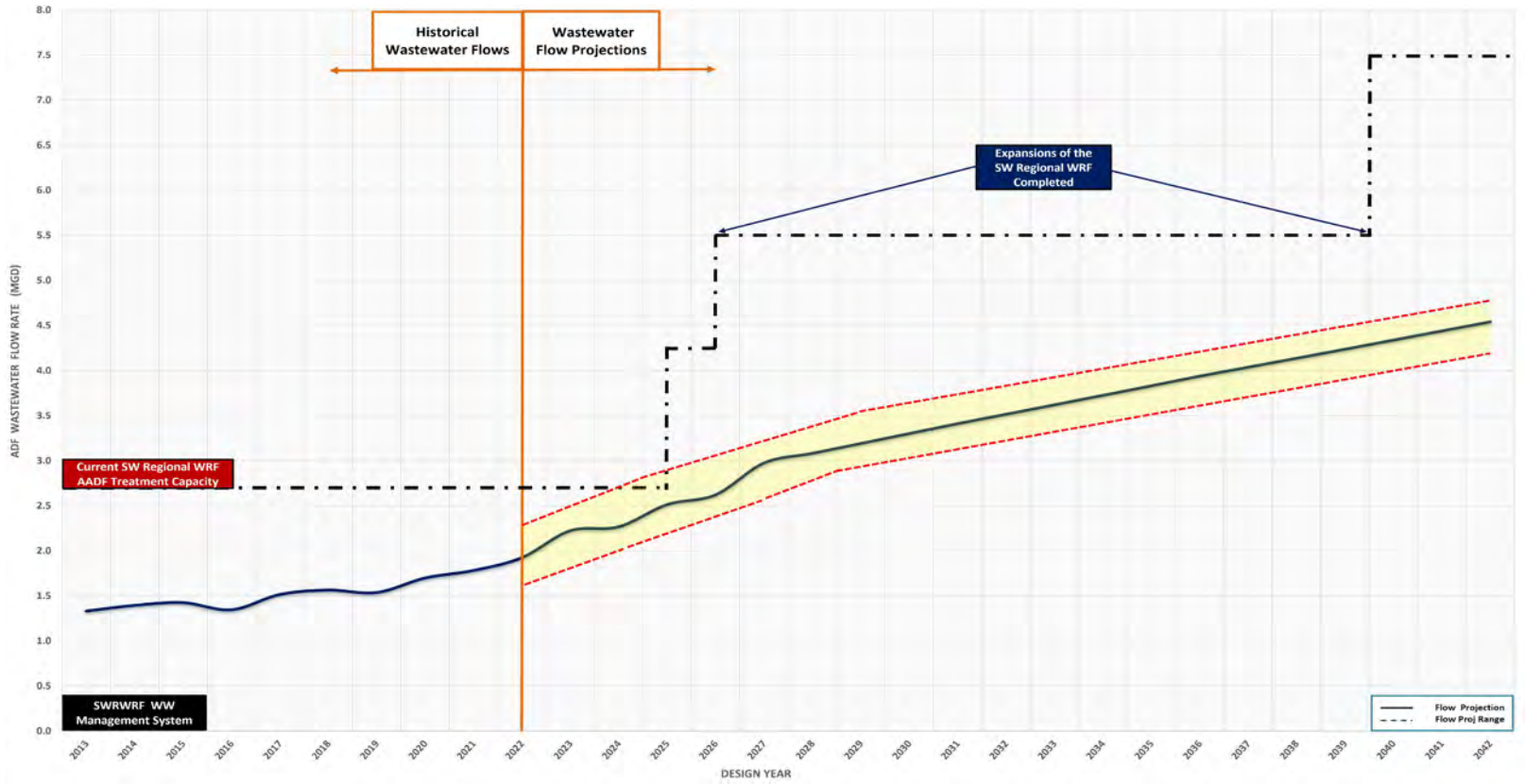

FIGURE 3.4-1 **SW REGIONAL WW MANAGEMENT SYSTEM: WASTEWATER FLOW PROJECTIONS**

3.5 SOUTHWEST REGIONAL WRF WASTEWATER MANAGEMENT SYSTEM

The central wastewater collection system is not anticipated to be provided to the entire Southwest Regional WRF wastewater management system service area during Design Years 2023 - 2042. Rather, the system will grow over time as development occurs and some areas will likely remain on septic tanks in the Blue Spring and Blue Spring Run Area over this period, as previously indicated, until regulatory changes take place. Treatment and collection facilities will be sized to serve the entire service area. It is anticipated that the number of septic tanks will remain relatively constant through 2027, after which, it is anticipated that regulations will require homeowners in the Blue Spring and Blue Spring Run area to begin abandoning septic tanks and connecting to the County's central wastewater collection system. It is estimated that the septic tank abandonment program will take approximately twenty (20) years to complete due to the number of septic tanks, overall program cost, and will include, but is not limited to, the following elements:

- Volusia County's cost for expansion of the wastewater collection/transmission system.
- Homeowner's cost for disconnection and abandonment of their existing septic tank.
- Homeowner's cost for connection to the County's wastewater collection system.

Significant State funding (Legislature, FDEP and SJRWMD) will be required to get the septic tank abandonment program moving forward. However, when a funding mechanism becomes available and the program is implemented, nitrogen and phosphorus loadings in the Blue Spring and Blue Spring Run area will be significantly reduced.

3.6 SOUTHWEST REGIONAL WRF RECLAIMED WATER FACILITIES

Volusia County has, as previously described, implemented a large scale system for the beneficial reuse of effluent from the Southwest Regional WRF. Reclaimed water is currently being used for public access spray irrigation of residential neighborhoods and the DeBary Plantation Golf Course as well as effluent disposal via a system of Rapid Infiltration Basins (RIBs) throughout the regional service area. A summary of the currently permitted reclaimed water spray irrigation sites and the RIB systems and their capacities was previously presented in Section 2.6 of this Capacity Analysis Report. The current effluent disposal capacity of the Southwest Regional WRF is 4.750 MGD. The Southwest Regional WRF reclaimed water system consists of the following infrastructure:

- A reclaimed water distribution pump station at the Southwest Regional WRF consisting of five (5) pumps designed to convey approximately 5.040 MGD to the various reclaimed water irrigation sites, with the largest pump out of service.

- Reclaimed water storage (8.5 MG, total) located throughout the Southwest Regional Wastewater Management Service Area as presented previously in Table 2.6-2.

- A system of Rapid Infiltration Basins (RIBs) at the following locations: (1) Southwest Regional WRF; (2) Terra Alta; (3) Deltona North WRF and (4) Four Towns.

As the wastewater demand increases due to growth in the service area, the reclaimed water distribution system, and potentially the RIB system, will have to be expanded to meet the increased reclaimed water demand and effluent disposal requirements (reject water, wet weather conditions or inadequate demand).

Potential future reclaimed water/effluent disposal sites, along with their potential disposal capacity, are presented below in Table 3.6-1. The potential disposal sites have an aggregate additional disposal capacity of 3.369 MGD. Therefore, the County has the capability to meet the reclaimed water/effluent disposal demands within its service area, through the twenty (20) year planning period, via expansion of its current reclaimed water distribution system to incorporate additional public access spray irrigation sites.

Table 3.6-1: SW Regional WRF - Potential Reclaimed Water / Effluent Disposal Sites

Potential Disposal Site	Additional Future Disposal Capacity	
	(MGD)	(kgal/month)
Residential Irrigation - South of Dirksen Drive	0.600	18,250
Residential Irrigation - Reserve at DeBary	0.111	3,376
Residential Irrigation - Glen Abbey and Fawn Ridge	0.128	3,893
Residential Irrigation - Springview	0.876	26,645
Residential Irrigation - Parkview	0.804	24,455
I-4 Activity Center	0.100	3,042
Integra 289	0.100	3,042
The Junction	0.100	3,042
Miscellaneous Developments in Service Area	0.500	15,208
Duke Energy	0.050	1,521
Total	**3.369**	**102,474**

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SECTION 4

RECLAIMED WATER DISPOSAL

4.1 GENERAL

As documented in previous sections of this Capacity Analysis Report (CAR), the Southwest Regional WRF Wastewater Management System Service Area is expected to continue to grow during the 20-year planning horizon (2022 - 2042). This growth will require an expansion of the water and wastewater treatment facilities, biosolids management systems, wastewater collection and transmission systems, water distribution systems and the reclaimed water distribution and pumping systems, at some point in the future. The County has, as previously described, implemented a large scale system for the beneficial reuse of the high-quality effluent from the Southwest Regional WRF.

Reclaimed water is currently being used for public access, slow-rate spray irrigation of County properties, golf courses, residential neighborhoods and commercial/industrial establishments. Effluent is also disposed of through a system of Rapid Infiltration Basins (RIBs) owned and operated by the County. The Southwest Regional WRF Reclaimed Water System is beneficial to the community and has the following advantages:

- Conservation of the highest quality water for potable use.
- Reduction of groundwater withdrawal rates to mitigate salt water intrusion and maintain potable water supplies for the future.
- Water system expansions can be postponed due to consumptive use reductions.
- Development of a cost-effective alternative for effluent disposal.
- Beneficial use of reclaimed water as a resource while conserving groundwater supplies for future potable use.

In the last twenty-nine (29) years the County has spent in excess of $30 million upgrading its wastewater treatment facilities, related infrastructure, effluent disposal systems; addressing infiltration and inflow in its wastewater collection system; upgrading the wastewater collection system; and developing, implementing and constructing a large scale public access reclaimed water distribution and irrigation system throughout its service area.

The wastewater management and reclaimed water systems have had great success and have proven to be very beneficial to the community as well as being environmentally friendly and sustainable. Therefore, ***the only feasible effluent disposal alternative for the Southwest Regional WRF Wastewater Management System, is continued reliance on the existing slow-rate, public access reuse and RIB systems and the development of the County's maximum reuse potential*** as referenced in the FDEP guidelines for future expansion of the wastewater and reclaimed water systems.

4.2 COMPLIANCE OF THE EXISTING REUSE SYSTEM

The Southwest Regional Water Reclamation Facility (SWRWRF) and Reuse System Service Area are currently permitted under FDEP Operations Permit No. FLA011128. A copy of the current Southwest Regional WRF Operations Permit is provided in Appendix B of this Capacity Analysis Report (CAR).

Volusia County has endeavored to comply with all existing rules (State and Federal), permit conditions and surface and groundwater standards. In accordance with the County's Cross Connection Control Policy and Utilities Standards, the County is complying with all Operations Permit conditions and with the Chapter 62-600, F.A.C series regulations.

4.3 CURRENT USER CHARGE SYSTEM

Reuse of reclaimed water is accomplished through public access spray irrigation at various locations throughout the Southwest Regional Reclaimed Water Service Area. The current User Charge for reclaimed water is as follows (as of 1/1/2023):

Reclaimed Water Usage (gallons)	Charge per 1,000 gallons
< 10,000	$1.88
10,001 - 15,000	$2.16
> 15,000	$3.61

This is less expensive than using potable water for irrigation. The current User Charge for potable water (unsoftened) in the Southwest Regional service area is as follows:

Potable Water Usage (gallons)	Charge per 1,000 gallons
< 5,000	$2.52
5,001 - 10,000	$3.16
10,001 - 15,000	$3.80
15,001 - 20,000	$4.41
> 20,000	$14.43

The current user charges were recently adjusted to account for all Capital Improvement Plan (CIP) Projects and utility operating costs/expenses, are automatically escalated on an annual basis (CPI + 1%) and are evaluated every fiscal year to ensure that the County is meeting its current and future debt service and operating cost responsibility.

Therefore, there is a very strong incentive for the reclaimed water customers to use this valuable commodity (reclaimed water) not only to save themselves money, but to save fresh water reserves and the environment in this portion of Volusia County.

4.4 SUMMARY

The large wastewater treatment facility and reclaimed water system capital investment and infrastructure currently in place in the Southwest Regional WRF Wastewater Management Service Area leave the County with only ***one feasible option for effluent disposal, that being the present system of public access, slow-rate spray irrigation of County owned properties, residential communities, commercial/industrial areas, golf courses, and the use of the FDEP-permitted Rapid Infiltration Basins (RIBs)***. The system has been an overwhelming success within the communities comprising the Southwest Regional WRF Wastewater Management System Service Area. Not only are the residents reducing their monthly expenditures by using the highly quality reclaimed water, but they are conserving precious groundwater resources by reducing withdrawals from the aquifer as well as recharging the environment's water resources through spray irrigation of reclaimed water. The Rapid Infiltration Basins (RIBs) are also providing an important environmental function by recharging the surficial aquifer.

Volusia County has inter-local agreements with the City of Sanford, City of DeLand and City of Deltona to address reclaimed water and water conservation issues in the southwestern Volusia County regional area. Various reclaimed water and augmentation facility projects have been designed, constructed and implemented throughout the regional area.

The Southwest Regional WRF is classified as an *Advanced Wastewater Treatment plus Filtration Facility (Category I, Class B)* utilizing 4-Stage Bardenpho Process (3 treatment trains) to treat the incoming raw wastewater from the service area to AWT standards. The

treatment facility produces a high-quality effluent, *reclaimed water*, meeting all State and Federal reclaimed water requirements. During periods when the reclaimed water supply exceeds consumer demand (wet weather events), the County has the ability to discharge the effluent to a system of Rapid Infiltration Basins (RIBs) throughout the Southwest Regional WRF Wastewater Management System Service Area. To ensure that the permit conditions are met and that reclaimed water meeting public access criteria is available at all times, the County has developed a very strong reclaimed water program composed of the following elements:

- An approved Industrial Waste Pretreatment Program (IWPP), to ensure the quality of the incoming raw wastewater will not interfere with the SW Regional WRF's biological nutrient removal system and the production of reclaimed water.

- An approved water reclamation facility and reclaimed water system Monitoring and Operating Protocol (MOP) that ensures the reclaimed water quality operating criteria (high-level disinfection, pH and TSS requirements) are met before the reclaimed water is released to the public access reuse system and, in the event of an excursion, assists the Operator(s) in dealing with the situation and getting the system back *on-line* and within permitted guidelines.

- An approved Cross-Connection Control Program to ensure compliance of all customers with the program as well as periodic inspections of back-flow devices, etc.

- A reclaimed water and sewer use ordinance.

- A group of registered facility operators with experience in the production of reclaimed water.

- An expandable reclaimed water distribution system to convey reclaimed water to a wide variety of slow-rate, public access reuse sites and Rapid Infiltration Basins (RIBs).

- A *take-back* program for new developments.

- A User Charge system that significantly promotes the use of reclaimed water over potable water for spray irrigation/land application purposes.

The current reclaimed water program, operational for over twenty-nine (29) years, utilizes a significant distribution system to provide reclaimed water to customers for slow-rate, spray irrigation purposes and has been very successful. The system is currently in compliance with all of the FDEP Operations Permit conditions, with the requirements outlined in Chapter 62-610, F.A.C., and with all surface and groundwater standards. The slow-rate, public access reuse and Rapid Infiltration Basin (RIB) systems provide the added benefit of reducing the withdrawals of groundwater while also recharging the local surficial aquifer. Volusia County has intended future expansions of the wastewater collection and transmission systems, water distribution systems, Southwest Regional WRF, biosolids management system, and effluent disposal systems (public access, slow-rate spray irrigation and rapid infiltration basins) at some point in the 20-year planning horizon to meet the ever-growing influx of residents and industry within the Southwest Regional WRF Wastewater Management System Service Area and the associated raw wastewater and reclaimed water demands.

Reclaimed water will become a more desirable commodity and the problem of disposal will likely become a problem of satisfying and controlling the demand of reclaimed water experienced by other entities. ***The current effluent disposal system (public access, slow-rate reuse and Rapid Infiltration Basins) has been utilized for over twenty-nine (29) years and, as indicated previously, based on the investment in it to date, is the only feasible effluent disposal method that meets the goals of the County's Wastewater Management Program and the Southwest Regional WRF***.

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SECTION 5

SUMMARY AND CONCLUSIONS

5.1 SUMMARY AND CONCLUSIONS

The Southwest Regional WRF, located at 800 DeBary Plantation Blvd., DeBary, FL 32713, is classified as an *Advanced Wastewater Treatment plus Filtration Facility (4-Stage Bardenpho Process)* utilizing three (3) treatment trains to treat the raw wastewater from the service area and meets all Class I Reliability criteria. The treatment facility consists of the following infrastructure:

- Raw wastewater flow metering system and sampling system.
- Influent Structure with two mechanical barscreens and a bypass channel with a manual barscreen.
- Master lift station.
- In-line flow equalization (EQ) basin and associated mixing/aeration systems, appurtenances and ancillaries.
- Anaerobic/anoxic basin and associated mixing system, appurtenances and ancillaries.
- Flow equalization basin pump station.
- Three (3) BNR treatment trains, with primary anoxic, aerobic, and secondary anoxic basins.
- A common reaeration basin with an integral secondary clarifier flow splitter box and associated appurtenances.

- Two (2) secondary clarifiers (60-foot diameter, 14'-8" side water depth) with spiral scrapers and scum trapping system.
- RAS/WAS pumping system.
- Tertiary filtration system consisting of two (2) disc filtration units.
- High-level disinfection system including a dual compartment CCC and sodium hypochlorite storage and feed systems.
- Transfer pump station.
- Two (2) prestressed, concrete, reclaimed water ground storage tanks.
- Reclaimed water distribution pump station.
- Two (2) on-site Rapid Infiltration Basins (RIBs).
- Aerobic digestion system and associated infrastructure.
- Biosolids dewatering system.
- Electronic control (facility monitoring) and SCADA system.

Influent loadings to the unit operations/processes at the Southwest Regional WRF were evaluated as part of this Capacity Analysis Report (CAR). Calendar Year 2022 data indicates that ***the loadings being treated at the facility are below the operational loading ranges used to establish the design capacity of the facility***. The overall wastewater treatment capacity of the Southwest Regional WRF Wastewater Management System is 2.700 MGD AADF and the facilities are ***meeting all effluent limits mandated within the FDEP Operations Permit***. The capacity of the system's effluent disposal system (slow-rate, public access spray irrigation and rapid infiltration basins) is 4.750 MGD AADF.

The following will have a considerable effect on the raw wastewater flows received at the Southwest Regional WRF and the growth of the wastewater collection and transmission system:

- Population growth within the Southwest Regional WRF Wastewater Management System Service Area.
- The Deltona North WRF wastewater flows being transferred to the SW Regional WRF for treatment.

- The potential for the City of Deltona's Fisher WWTP wastewater flows to be transferred to the SW Regional WRF for treatment (anticipated to begin in 2025).
- The potential requirement for abandonment of septic tanks in the service area, due to their associated nutrient impact on Blue Spring and Blue Spring Run.

The current population within the service area is estimated to be approximately 13,800 based on population data obtained from the Florida Housing Data Clearinghouse, Volusia County, and the U.S. Census Bureau. Wastewater facility flow records, anticipated growth rates, U.S. Census data, potential flow transfer from the City of Deltona's Fisher WWTF and septic tank abatement assumptions were used to evaluate the service area needs and demands for the 20-year planning horizon (2023 - 2042). Raw wastewater flow projections for the Southwest Regional WRF Wastewater Management System Service Area, through Design Year 2042, are presented below in Table 5.1-1.

Table 5.1-1: Southwest Regional WRF Wastewater Management System - Wastewater Flow Projections

Design Year	SWRWRF Raw Wastewater Flow - AADF (MGD)	Deltona North WRF Flow Transfer - AADF (MGD)*	Septic Tank Flow - AADF (MGD)**	City of Deltona Fisher WWTF Flow Transfer AADF (MGD)***	Total Wastewater Flow Projection - AADF (MGD)
2022	1.923				1.923
2023	1.961	0.260			2.221
2024	2.001	0.265			2.266
2025	2.041	0.271		0.200	2.511
2026	2.082	0.276	0.058	0.204	2.619
2027	2.118	0.281	0.116	0.458	2.972
2028	2.155	0.286	0.174	0.466	3.080
2029	2.193	0.291	0.232	0.474	3.189
2030	2.231	0.296	0.290	0.482	3.299
2031	2.270	0.301	0.348	0.490	3.410
2032	2.304	0.305	0.406	0.498	3.513
2033	2.339	0.310	0.464	0.505	3.618
2034	2.374	0.315	0.522	0.513	3.723
2035	2.409	0.319	0.580	0.521	3.829
2036	2.446	0.324	0.638	0.528	3.936

Table 5.1-1: Southwest Regional WRF Wastewater Management System - Wastewater Flow Projections

Design Year	SWRWRF Raw Wastewater Flow - AADF (MGD)	Deltona North WRF Flow Transfer - AADF (MGD)*	Septic Tank Flow - AADF (MGD)**	City of Deltona Fisher WWTF Flow Transfer AADF (MGD)***	Total Wastewater Flow Projection - AADF (MGD)
2037	2.476	0.328	0.696	0.535	4.035
2038	2.507	0.332	0.754	0.542	4.135
2039	2.538	0.336	0.812	0.548	4.235
2040	2.570	0.341	0.870	0.555	4.336
2041	2.602	0.345	0.928	0.562	4.437
2042	2.635	0.349	0.986	0.569	4.539

* *New Master Lift Station constructed at the Deltona North WRF and raw wastewater flows shall be transferred, over time, to the Southwest Regional WRF for treatment*

** *200 septic tanks per year connected to the SW Regional WRF at a WW generation rate of 230 gpd/dwelling.*

*** *Potential transfer of Deltona Fisher WWTF flows (50% of WW flow in 2025 and the remainder in 2027).*

The raw wastewater flow projection data for the Southwest Regional WRF Wastewater Management System indicates the following:

- The Southwest Regional WRF is currently operating at 71.2% of its current treatment capacity.
- The Southwest Regional WRF is currently operating at 40.5% of the wastewater management system's current reclaimed water/effluent disposal capacity.
- The Southwest Regional WRF will be ***able to operate within its treatment and hydraulic capacities and produce an effluent meeting all effluent limitations*** through Calendar Year 2026.

- Design of treatment facility improvements are currently underway at the Southwest Regional WRF and are anticipated to be completed and the systems operational in Calendar Year 2025.

The Southwest Regional WRF has the wastewater treatment and reclaimed water/effluent disposal capacity (slow-rate, public access reuse and RIB's) available to meet the projected raw wastewater flows through Calendar Year 2026.

5.2 PROPOSED CAPITAL IMPROVEMENTS PLAN (CIP)

The Volusia County Water Resources and Utilities Department evaluates and updates, on an annual basis, their Capital Improvements Plan (CIP). The proposed five (5) year CIP improvements for the Southwest Regional WRF Wastewater Management System are presented below in Table 5.2-1.

Table 5.2-1 Southwest Regional WRF Wastewater Management System - Capital Improvements Plan (2023 - 2027)

Location	Proposed Improvements
Southwest Regional WRF	Treatment Capacity Expansion (to 5 - 6 MGD)
	Class "A" Biosolids Management System
	Third Reclaimed Water Ground Storage Tank (5 - 10 MG)
SW Volusia Effluent Disposal System	Reclaimed Water / Rapid Infiltration Basin (RIB) System Expansion

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APPENDIX A

SOUTHWEST REGIONAL WRF:

COUNTY-OWNED LIFT STATIONS

VOLUSIA COUNTY WASTEWATER MANAGEMENT SYSTEM

Volusia County
FLORIDA

MARCH 2023

Volusia County FLORIDA cph

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Southwest Regional WRF Wastewater Management System - Lift Stations			
Lift Station No.	**Address**	**City**	**Lift Station Name**
SW-7	505 East Ohio	Orange City	Blue Springs Villas
SW-8	3 Leisure Drive - South	DeBary	Meadowlea on the River
SW-9	880 Naval Orange Drive	Orange City	Orange Tree Village
SW-10	900 Thorpe Avenue	Orange City	GreenLeaf Apartments
SW-11	1550 Mimosa Avenue	Orange City	Mimosa
SW-12	2425 South Volusia Avenue	Orange City	Whispering Pines
SW-13	113 Treemonte Avenue	Orange City	Four Townes
SW-14	405 Terrace Hills Blvd	Orange City	Terrace Hills
SW-15	52 Florance Blvd	DeBary	Terra Alta
SW-16	341 Kingslake Drive	DeBary	Kings Lake
SW-17	499 North US Highway 17-92	DeBary	DeBary Villas
SW-18	150 DeBary Plantation Blvd	DeBary	DeBary Plantation I
SW-19	699 DeBary Plantation Blvd	DeBary	DeBary Plantation II
SW-20	227 Eagle Estates Drive	DeBary	DeBary Plantation III
SW-21	26 Dogwood Trail	DeBary	St. Anns Church
SW-22	2 North US Highway 17-92	DeBary	Winn Dixie
SW-23	102 West Highbanks	DeBary	DeBary Elementary School
SW-24	30 Legion Place	DeBary	Legion Place
SW-25	399 South Shell Road	DeBary	Shell Road
SW-26	37 Dirksen Drive	DeBary	Gemini Springs Park
SW-27	347 South US Highway 17-92	DeBary	Parkview
SW-28	19 South Highway 17-92 at Highbanks	DeBary	17-92 and Highbanks
SW-29	30 Fairway Drive	DeBary	Glen Abbey South
SW-30	312 Glen Club Road	DeBary	Glen Abbey North
SW-31	126 Pine Valley Court	DeBary	Pine Valley
SW-32	568 South Pine Meadow Drive	DeBary	South Pine Meadow
SW-33	201 Glen Abbey Lane	DeBary	The Swallows II
SW-34	89 Toronto Drive	DeBary	The Swallows I
SW-35	2845 Enterprise Road	DeBary	Demora Center - Live Oak
SW-36	2810 Enterprise Road	DeBary	Mariner Health Care
SW-37	1645 Howland Crossings	Deltona	Howland Crossings

Southwest Regional WRF Wastewater Management System - Lift Stations			
Lift Station No.	Address	City	Lift Station Name
SW-38	399 South Charles R. Beall	DeBary	VFW Post
SW-39	898 Saxon Blvd	Orange City	Fazoli's
SW-40	2670 Enterprise Road	Orange City	Market Place at Glen Abbey
SW-41	Crown Centre Blvd	Orange City	Crown Center
SW-42	2515 Enterprise Road	Orange City	Orange City Villas
SW-43	101 Grand Plaza Blvd	Orange City	Grand Plaza
SW-44	765 Fairlane/Junior Street	Orange City	Breezewood 7
SW-45	Roberts Road/Breezewood	Orange City	Professional Building
SW-46	Strawberry Oaks Drive	Orange City	Water Oaks
SW-47	205 East Industrial Drive	Orange City	Industrial Park
SW-48	848 Laynard Lane	DeBary	Summer Haven
SW-50	105 James Pond Court	DeBary	Glen Abbey 7B
SW-51	1224 Saxon Blvd	Orange City	Saxon Blvd Development
SW-54	109 Treemont Drive	Orange City	Treemont
SW-55	1128 Saxon Blvd	DeBary	Waterloo Development
SW-56	158 Verde Way	DeBary	Riviera Bella
SW-57	120 Southlake Blvd	Orange City	John Knox Village
SW-58	2 Hammock Oak Circle	DeBary	DeBary Plant IV
SW-59	831 South US Highway 17-92	DeBary	Delmus Wood
SW-60	2627 Enterprise Road	Orange City	Orange City Regional
SW-61	1643 Horsehead Road	Enterprise	Stone Island 1
SW-62	1490 Warrior Road	Enterprise	Stone Island 2
SW-63	1490 Arrow Head Trail	Enterprise	Stone Island 3
SW-64	1420 Kettledrum Trail	Enterprise	Stone Island 4
SW-65	1491 Stone Trail	Enterprise	Stone Island 5
SW-66	502 Quail View Court	DeBary	Quail View
SW-71	875 Division Street	Orange City	Manatee Cove
SW-73	975 Moonlight Cove Road	Orange City	Enterprise Cove
SW-81	80 Rosa Bella View	DeBary	Riviera Bella II
SW-82	408 Lazio Circle	DeBary	Riviera Bella III
SW-83	600 Lazio Circle	DeBary	Riviera Bella III

Southwest Regional WRF Wastewater Management System - Lift Stations			
Lift Station No.	**Address**	**City**	**Lift Station Name**
SW-84	122 Integra Reserve Lane	DeBary	Integra 289
SW-85	212 Florida Willow Avenue	DeBary	Springview
SW-86	718 Porter Rye	DeBary	Rivington
SW-87	738 Terrapin Drive	DeBary	Rivington

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APPENDIX B

SOUTHWEST REGIONAL WRF:

FDEP OPERATIONS PERMIT

VOLUSIA COUNTY WASTEWATER MANAGEMENT SYSTEM

MARCH 2023

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FLORIDA DEPARTMENT OF
Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

NOTICE OF PERMIT ISSUANCE

Michael Ulrich, Director
Volusia County Water Resources and Utilities
123 West Indiana Avenue
DeLand, FL 32720
mulrich@volusia.org

Volusia County - DW
VC Southwest Regional WWTF -1

Enclosed is Permit Number FLA011128-014 to operate a domestic wastewater facility issued under Sections 403.087 and 403.0885 of the Florida Statutes.

Monitoring requirements under this permit are effective on February 1, 2019. Until such time, the permittee shall continue to monitor and report in accordance with previously effective permit requirements.

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rules 28-106.201 and 28-106.301, F.A.C., a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;
(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;
(c) A statement of when and how the petitioner received notice of the agency decision;
(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;
(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant and persons entitled to written notice under Section 120.60(3), F.S., must be filed within **14** days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S., must be filed within **14** days of publication of the notice or within 14 days of receipt of the written notice, whichever occurs first. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us, before the deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

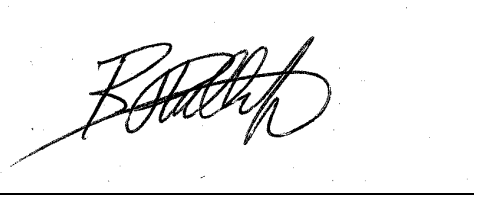
Mediation is not available in this proceeding.

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Florida Rules of Appellate Procedure 9.110 and 9.190 with the Clerk of the Department in the Office of General Counsel (Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000) and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice must be filed within 30 days from the date this action is filed with the Clerk of the Department.

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



For:
Lu Burson
Environmental Administrator
Permitting and Waste Cleanup Program

LB/wgb

Enclosures: Permit, DMR and SOB

CERTIFICATE OF SERVICE
The undersigned duly designated deputy clerk hereby certifies that this document and all attachments were sent on the filing date below to the following listed persons:

Rocco R. Nasso, P.E., CPH, rnasso@cphcorp.com
Benjamin Fries, CPH, bfries@cphcorp.com
Sirena Davila, DEP, sirena.davila@dep.state.fl.us
Wilmott Brown, DEP, wilmott.brown@dep.state.fl.us
David Smicherko, DEP, david.smicherko@dep.state.fl.us
Mary Ann Kraus, DEP, mary.kraus@dep.state.fl.us
Shabbir Rizvi, DEP, shabbir.rizvi@dep.state.fl.us

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to Section 120.52, F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.

Stacey Gardiner

December 6, 2018

Clerk **Date**

FLORIDA DEPARTMENT OF
Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

STATE OF FLORIDA
DOMESTIC WASTEWATER FACILITY PERMIT

PERMITTEE:
Volusia County Water Resources and Utilities

RESPONSIBLE OFFICIAL:
Michael Ulrich, Director
123 W Indiana Ave
Deland, Florida 32720
(386) 943-7027

PERMIT NUMBER: FLA011128
FILE NUMBER: FLA011128-014-DW1P
EFFECTIVE DATE: **December 6, 2018**
EXPIRATION DATE: **December 5, 2023**

FACILITY:

VC/Southwest Regional WWTF-1
800 Debary Plantation Blvd
Debary, FL 32713-2270
Volusia County
Latitude: 28°54' 32.79" N Longitude: 81°19' 31.47" W

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and applicable rules of the Florida Administrative Code (F.A.C.). This permit does not constitute authorization to discharge wastewater other than as expressly stated in this permit. The above-named permittee is hereby authorized to operate the facilities in accordance with the documents attached hereto and specifically described as follows:

WASTEWATER TREATMENT:

An existing 2.341 million gallons per day (MGD) annual average daily flow (AADF) permitted capacity domestic wastewater treatment plant (2.70 mgd design capacity) consisting of influent screening, aeration, secondary clarification, chemical feed facilities, filtration, chlorination and aerobic digestion of biosolids. The treatment facility includes an Upflow Sludge Blanket Filtration (USBF) treatment process (treatment train #3) and Orbal Treatment Train (treatment trains # 1 and 2), using the 5 stage Bardenpho process. The USBF structure was built to house three parallel 0.5 MGD AADF treatment basins, however only one of the basins is equipped at this time (0.7 MGD AADF). Facilities also include electronic sensors and automatic diversion valves, on-site 4.5 million gallon (total) (MG) reclaimed water/wet weather ground storage tanks (2 tanks) and high service pump station, and a standby diesel-powered generator. After the proposed Biological Nutrient Removal (BNR) improvements were made (2018), the design capacity of the facility is 2.7 mgd AADF (1.0 MGD treatment train no. 1, 1.0 MGD treatment train no. 2, and 0.7 MGD treatment train no. 3), with the permitted capacity limited to 2.341 MGD, the capacity of the reuse system.

REUSE OR DISPOSAL:

Land Application R-001: An existing 1.421 MGD annual average daily flow permitted capacity slow-rate public access system. R-001 is a reuse system which consists of an existing 2.0 MG wet weather storage pond at the DeBary Golf Course, 1.0 MG wet weather storage at the Deltona North Ground Storage tank, 2.0 MG of reject storage in the existing on-site rapid infiltration basins (RIBs), with return capability to the treatment plant (oxidation ditch) for re-treatment, and irrigation within the Reuse Service Area.

Land Application R-002: An existing 0.920 MGD annual average daily flow permitted capacity rapid infiltration basin system. R-002 is a reuse system which consists of the existing Four Towns RIBs with a total wetted area of 7.3 acres having a capacity of 0.3 MGD, Deltona North RIB #3 with a total wetted area of 2.54 acres having a capacity of 0.19 MGD, the On-site RIBs with a total wetted area of 4.2 acres having a capacity of 0.33 MGD, and the Terra-Alta RIBs with a total wetted area of 3.75 acres having a capacity of 0.1 MGD.

IN ACCORDANCE WITH: The limitations, monitoring requirements, and other conditions set forth in this cover sheet and Part I through Part IX on pages 1 through 24 of this permit.

I. RECLAIMED WATER AND EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Reuse and Land Application Systems

1. During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to direct reclaimed water to Reuse System R-001. Such reclaimed water shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.B.8.:

			Reclaimed Water Limitations		Monitoring Requirements			
Parameter	Units	Max/Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow (Flow to R-001)	MGD	Max Max	1.421 Report	Annual Average Monthly Average	Continuous	Recording Flow Meter with Totalizer	FLW-4	See I.A.4
Flow (From City of Sanford)	MGD	Max Max	Report Report	Annual Average Monthly Average	Continuous	Recording Flow Meter with Totalizer	FLW-7	See I.A.4
BOD, Carbonaceous 5 day, 20C	mg/L	Max Max Max Max	20.0 30.0 45.0 60.0	Annual Average Monthly Average Weekly Average Single Sample	Weekly	16-hr FPC	EFA-1	
Solids, Total Suspended	mg/L	Max	5.0	Single Sample	4 Days/Week	Grab	EFB-1	
Coliform, Fecal	#/100mL	Max	25	Single Sample	4 Days/Week	Grab	EFA-1	
Coliform, Fecal, % less than detection	percent	Min	75	Monthly Total	4 Days/Week	Calculated	EFA-1	See I.A.5
pH	s.u.	Min Max	6.0 8.5	Single Sample Single Sample	Continuous	Meter	EFA-1	See I.A.3
Chlorine, Total Residual (For Disinfection)	mg/L	Min	1.0	Single Sample	Continuous	Meter	EFA-1	See I.A.6 and I.A.8
Solids, Total Suspended	mg/L	Max	Report	Single Sample	Continuous	Meter	EFB-1	
Giardia	cysts/100L	Max	Report	Single Sample	Bi-annually; every 2 years	Grab	EFA-1	See I.A.9
Cryptosporidium	oocysts/100L	Max	Report	Single Sample	Bi-annually; every 2 years	Grab	EFA-1	See I.A.9
Nitrogen, Total	mg/L	Max Max	Report Report	Annual Average Monthly Average	Monthly	16-hr FPC	EFA-1	See I.A.10
Phosphorus, Total (as P)	mg/L	Max Max	Report Report	Annual Average Monthly Average	Monthly	16-hr FPC	EFA-1	See I.A.10

2. Reclaimed water samples shall be taken at the monitoring site locations listed in Permit Condition I.A.1. and as described below:

Monitoring Site Number	Description of Monitoring Site
FLW-4	Flow meter after high service pumps to public access reuse
FLW-7	Flow meter from City of Sanford reclaimed interconnect
EFA-1	Chlorine contact chamber effluent
EFB-1	Filter effluent prior to chlorination

3. Hourly measurement of pH during the period of required operator attendance may be substituted for continuous measurement. *[62-600.660(1)]*

4. A recording flow meter with totalizer shall be utilized to measure flow and calibrated at least once every 12 months. *[62-600.200(25)]*

5. To report the "% less than detection," count the number of fecal coliform observations that were less than detection, divide by the total number of fecal coliform observations in the month, and multiply by 100% (round to the nearest integer). *[62-600.440(6)(a)]*

6. The minimum total chlorine residual shall be limited as described in the approved operating protocol, such that the permit limitation for fecal coliform bacteria will be achieved. In no case shall the total chlorine residual be less than 1.0 mg/L. *[62-600.440(6)(b)][62-610.460(2)][62-610.463(2)]*

7. The treatment facilities shall be operated in accordance with all approved operating protocols. Only reclaimed water that meets the criteria established in the approved operating protocol(s) may be released to system storage or to the reuse system. Reclaimed water that fails to meet the criteria in the approved operating protocol(s) shall be directed to the following permitted alternate discharge system: On site rapid infiltration basins (part of R-002 - FLW-2). *[62-610.320(6) and 62-610.463(2)]*

8. Instruments for continuous on-line monitoring of total residual chlorine and turbidity shall be equipped with an automated data logging or recording device. *[62-610.463(2)]*

9. Intervals between sampling for Giardia and Cryptosporidium shall not exceed two years. *[62-610.463(4)]*

10. Monitoring for total nitrogen (TN) and total phosphorus (TP) are required, as allowed by Rule 62-600.650(3), FAC, to evaluate impacts of reclaimed water to ground and surface waters in an impaired water basin. [62-600.650(3)]

11. During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to direct reclaimed water to Reuse System R-002. Such reclaimed water shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.B.8.:

			Reclaimed Water Limitations		Monitoring Requirements			
Parameter	Units	Max/Min	Limit	Statistical Basis	Frequency of Monitoring	Sample Type	Monitoring Site Number	Notes
Flow (Flow to on-site RIBs)	MGD	Max Max	0.330 Report	Annual Average Monthly Average	Continuous	Recording Flow Meter with Totalizer	FLW-2	See I.A.14
Flow (Flow to Terra Alta RIBs)	MGD	Max Max	0.100 Report	Annual Average Monthly Average	Continuous	Recording Flow Meter with Totalizer	FLW-3	See I.A.14
Flow (Flow to Four Towns RIBs)	MGD	Max Max	0.300 Report	Annual Average Monthly Average	Continuous	Recording Flow Meter with Totalizer	FLW-5	See I.A.14
Flow (Flow to Deltona North RIB)	MGD	Max Max	0.190 Report	Annual Average Monthly Average	Continuous	Recording Flow Meter with Totalizer	FLW-6	See I.A.14
BOD, Carbonaceous 5 day, 20C	mg/L	Max Max Max Max	20.0 30.0 45.0 60.0	Annual Average Monthly Average Weekly Average Single Sample	Weekly	16-hr FPC	EFA-1	
Solids, Total Suspended	mg/L	Max Max Max Max	20.0 30.0 45.0 60.0	Annual Average Monthly Average Weekly Average Single Sample	Weekly	16-hr FPC	EFA-1	
Coliform, Fecal	#/100mL	Max Max Max	200 200 800	Monthly Geometric Mean Annual Average Single Sample	Weekly	Grab	EFA-1	See I.A.15
pH	s.u.	Min Max	6.0 8.5	Single Sample Single Sample	Continuous	Meter	EFA-1	See I.A.13
Chlorine, Total Residual (For Disinfection)	mg/L	Min	0.5	Single Sample	Continuous	Meter	EFA-1	See I.A.16 and I.A.13
Nitrogen, Nitrate, Total (as N)	mg/L	Max	12.0	Single Sample	Weekly	16-hr FPC	EFA-1	See I.A.17
Nitrogen, Total	mg/L	Max Max	Report Report	Annual Average Monthly Average	Monthly	16-hr FPC	EFA-1	See I.A.18
Phosphorus, Total (as P)	mg/L	Max Max	Report Report	Annual Average Monthly Average	Monthly	16-hr FPC	EFA-1	See I.A.18

12. Reclaimed water samples shall be taken at the monitoring site locations listed in Permit Condition I.A.10. and as described below:

Monitoring Site Number	Description of Monitoring Site
FLW-2	Flow meter to on-site rapid infiltration basins
FLW-3	Flow meter to Terra Alta rapid infiltration basins
FLW-5	Flow meter for Four Towns rapid infiltration basins
FLW-6	Flow (to Deltona North)
EFA-1	Chlorine contact chamber effluent

13. Hourly measurement of pH and total residual chlorine for disinfection during the period of required operator attendance may be substituted for continuous measurement. *[62-600.660(1)]*

14. A recording flow meter with totalizer shall be utilized to measure flow and calibrated at least once every 12 months. *[62-600.200(25)]*

15. The effluent limitation for the monthly geometric mean for fecal coliform is only applicable if 10 or more values are reported. If fewer than 10 values are reported, the monthly geometric mean shall be calculated and reported on the Discharge Monitoring Report to be used to calculate the annual average. *[62-600.440(5)(b)]*

16. Total residual chlorine must be maintained for a minimum contact time of 15 minutes based on peak hourly flow. *[62-610.510][62-600.440(5)(c) and (6)(b)]*

17. Nitrate nitrogen (NO3) concentration in the water discharged to the land application system shall not exceed 12.0 mg/L or as required to comply with Rule 62-610.510, F.A.C. *[62-610.510]*

18. Monitoring for total nitrogen (TN) and total phosphorus (TP) are required, as allowed by Rule 62-600.650(3), FAC, to evaluate impacts of reclaimed water to ground and surface waters in an impaired water basin. [62-600.650(3)]

B. Other Limitations and Monitoring and Reporting Requirements

1. During the period beginning on the effective date and lasting through the expiration date of this permit, the treatment facility shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.B.8.:

			Limitations		Monitoring Requirements			
Parameter	Units	Max/Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	Notes
Flow (Flow thru plant)	MGD	Max Max Max	2.341 Report Report	Annual Average Monthly Average 3-Month Rolling Average	Continuous	Recording Flow Meter with Totalizer	FLW-1	See I.B.4
Percent Capacity, (TMADF/Permitted Capacity) x 100	percent	Max	Report	Monthly Average	Monthly	Calculated	FLW-1	
BOD, Carbonaceous 5 day, 20C (Influent)	mg/L	Max	Report	Single Sample	Weekly	16-hr FPC	INF-1	See I.B.3
Solids, Total Suspended (Influent)	mg/L	Max	Report	Single Sample	Weekly	16-hr FPC	INF-1	See I.B.3

2. Samples shall be taken at the monitoring site locations listed in Permit Condition I.B.1. and as described below:

Monitoring Site Number	Description of Monitoring Site
FLW-1	Influent flow meter
INF-1	Raw influent at headworks

3. Influent samples shall be collected so that they do not contain digester supernatant or return activated sludge, or any other plant process recycled waters. *[62-600.660(4)(a)]*

4. A recording flow meter with totalizer shall be utilized to measure flow and calibrated at least once every 12 months. *[62-600.200(25)]*

5. Sampling results for giardia and cryptosporidium shall be reported on DEP Form 62-610.300(4)(a)4, Pathogen Monitoring, which is attached to this permit. This form shall be submitted to the Department's Central District Office and to DEP's Reuse Coordinator in Tallahassee. *[62-610.300(4)(a)]*

6. The sample collection, analytical test methods, and method detection limits (MDLs) applicable to this permit shall be conducted using a sufficiently sensitive method to ensure compliance with applicable water quality standards and effluent limitations and shall be in accordance with Rule 62-4.246, Chapters 62-160 and 62-600, F.A.C., and 40 CFR 136, as appropriate. The list of Department established analytical methods, and corresponding MDLs (method detection limits) and PQLs (practical quantitation limits), which is titled "FAC 62-4 MDL/PQL Table (April 26, 2006)" is available at https://floridadep.gov/dear/quality-assurance/content/quality-assurance-resources. The MDLs and PQLs as described in this list shall constitute the minimum acceptable MDL/PQL values and the Department shall not accept results for which the laboratory's MDLs or PQLs are greater than those described above unless alternate MDLs and/or PQLs have been specifically approved by the Department for this permit. Any method included in the list may be used for reporting as long as it meets the following requirements:

   a. The laboratory's reported MDL and PQL values for the particular method must be equal or less than the corresponding method values specified in the Department's approved MDL and PQL list;

   b. The laboratory reported MDL for the specific parameter is less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Parameters that are listed as "report only" in the permit shall use methods that provide an MDL, which is equal to or less than the applicable water quality criteria stated in 62-302, F.A.C.; and

   c. If the MDLs for all methods available in the approved list are above the stated permit limit or applicable water quality criteria for that parameter, then the method with the lowest stated MDL shall be used.

   When the analytical results are below method detection or practical quantitation limits, the permittee shall report the actual laboratory MDL and/or PQL values for the analyses that were performed following the instructions on the applicable discharge monitoring report.

   Where necessary, the permittee may request approval of alternate methods or for alternative MDLs or PQLs for any approved analytical method. Approval of alternate laboratory MDLs or PQLs are not necessary if the laboratory reported MDLs and PQLs are less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Approval of an analytical method not included in the above-referenced list is not necessary if the analytical method is approved in accordance with 40 CFR 136 or deemed acceptable by the Department. *[62-4.246, 62-160]*

7. The permittee shall provide safe access points for obtaining representative samples which are required by this permit. *[62-600.650(2)]*

8. **Monitoring requirements under this permit are effective on February 1, 2019**. Until such time, the permittee shall continue to monitor and report in accordance with previously effective permit requirements. During the period of operation authorized by this permit, the permittee shall complete and submit to the Department Discharge Monitoring Reports (DMRs) in accordance with the frequencies specified by the REPORT type (i.e. monthly, quarterly, semiannual, annual, etc.) indicated on the DMR forms attached to this permit. Unless specified otherwise in this permit, monitoring results for each monitoring period shall be

submitted in accordance with the associated DMR due dates below. DMRs shall be submitted for each required monitoring period including periods of no discharge.

REPORT Type on DMR	Monitoring Period	Submit by
Monthly	first day of month - last day of month	28th day of following month
Quarterly	January 1 - March 31 April 1 - June 30 July 1 - September 30 October 1 - December 31	April 28 July 28 October 28 January 28
Semiannual	January 1 - June 30 July 1 - December 31	July 28 January 28
Annual	January 1 - December 31	January 28

The permittee may submit either paper or electronic DMR forms. If submitting electronic DMR forms, the permittee shall use the electronic DMR system approved by the Department (EzDMR) and shall electronically submit the completed DMR forms using the DEP Business Portal at http://www.fldepportal.com/go/. Reports shall be submitted to the Department by the twenty-eighth (28th) of the month following the month of operation. Data submitted in electronic format is equivalent to data submitted on signed and certified paper DMR forms.

If submitting paper DMR forms, the permittee shall make copies of the attached DMR forms, without altering the original format or content unless approved by the Department, and shall mail the completed DMR forms to the Department's Central District Office at the address specified in Permit Condition I.B.13. by the twenty-eighth (28th) of the month following the month of operation.

[62-620.610(18)][62-600.680(1)]

9. During the period of operation authorized by this permit, reclaimed water or effluent shall be monitored annually for the primary and secondary drinking water standards contained in Chapter 62-550, F.A.C., (except for asbestos, total coliform, color, odor, and residual disinfectants). These monitoring results shall be reported to the Department annually on the DMR. During years when a permit is not renewed, a certification stating that no new non-domestic wastewater dischargers have been added to the collection system since the last reclaimed water or effluent analysis was conducted may be submitted with the signed DMR in lieu of performing the analysis. When such a certification is submitted with the DMR, monitoring not required this period should be noted on the DMR. The annual reclaimed water or effluent analysis report, and certification if applicable, shall be completed and submitted in a timely manner so as to be received by the Department at the address identified on the DMR by January 28 of each year. Approved analytical methods identified in Rule 62-620.100(3)(j), F.A.C., shall be used for the analysis. If no method is included for a parameter, methods specified in Chapter 62-550, F.A.C., shall be used. *[62-600.660(2) and (3)(d)][62-600.680(2)][62-610.300(4)]*

10. The permittee shall submit an Annual Reuse Report using DEP Form 62-610.300(4)(a)2. on or before January 1 of each year. *[62-610.870(3)]*

11. Operating protocol(s) shall be reviewed and updated periodically to ensure continuous compliance with the minimum treatment and disinfection requirements. Updated operating protocols shall be submitted to the Department's Central District Office for review and approval upon revision of the operating protocol(s) and with each permit application. *[62-610.320(6)][62-610.463(2)]*

12. The permittee shall maintain an inventory of storage systems. The inventory shall be submitted to the Department's Central District Office at least 30 days before reclaimed water will be introduced into any new storage system. The inventory of storage systems shall be attached to the annual submittal of the Annual Reuse Report. *[62-610.464(5)]*

13. Unless specified otherwise in this permit, all reports and other information required by this permit, including 24-hour notifications, shall be submitted to or reported to, as appropriate, the Department's Central District Office at the address specified below:

Electronic submittal is preferred, by sending to DEP_CD@dep.state.fl.us

Florida Department of Environmental Protection
Central District
3319 Maguire Blvd
Suite 232
Orlando, Florida 32803-3767

Phone Number - (407)897-4100

[62-620.305]

14. All reports and other information shall be signed in accordance with the requirements of Rule 62-620.305, F.A.C. *[62-620.305]*

II. BIOSOLIDS MANAGEMENT REQUIREMENTS

1. Biosolids generated by this facility may be transferred to Shelly's Environmental Systems or disposed of in a Class I solid waste landfill. Transferring biosolids to an alternative biosolids treatment facility does not require a permit modification. However, use of an alternative biosolids treatment facility requires submittal of a copy of the agreement pursuant to Rule 62-640.880(1)(c), F.A.C., along with a written notification to the Department at least 30 days before transport of the biosolids. *[62-620.320(6), 62-640.880(1)]*

2. The permittee shall monitor and keep records of the quantities of biosolids generated, received from source facilities, treated, distributed and marketed, land applied, used as a biofuel or for bioenergy, transferred to another facility, or landfilled. These records shall be kept for a minimum of five years. *[62-640.650(4)(a)]*

3. Biosolids quantities shall be monitored by the permittee as specified below. Results shall be reported on the permittee's Discharge Monitoring Report for Monitoring Group RMP-Q in accordance with Condition I.B.8.

			Biosolids Limitations		Monitoring Requirements		
Parameter	Units	Max/ Min	Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number
Biosolids Quantity (Transferred)	dry tons	Max	Report	Monthly Total	Monthly	Calculated	RMP-1
Biosolids Quantity (Landfilled)	dry tons	Max	Report	Monthly Total	Monthly	Calculated	RMP-1
Biosolids Quantity (Received)	dry tons	Max	Report	Monthly Total	Monthly	Calculated	RMP-1

[62-640.650(5)(a)1]

4. Biosolids quantities shall be calculated as listed in Permit Condition II.3 and as described below:

Monitoring Site Number	Description of Monitoring Site Calculations
RMP-1	Calculated (based on volume and estimated %solids)

5. The treatment, management, transportation, use, land application, or disposal of biosolids shall not cause a violation of the odor prohibition in subsection 62-296.320(2), F.A.C. *[62-640.400(6)]*

6. Storage of biosolids or other solids at this facility shall be in accordance with the Facility Biosolids Storage Plan. *[62-640.300(4)]*

7. Biosolids shall not be spilled from or tracked off the treatment facility site by the hauling vehicle. *[62-640.400(9)]*

8. Disposal of biosolids, septage, and "other solids" in a solid waste disposal facility, or disposal by placement on land for purposes other than soil conditioning or fertilization, such as at a monofill, surface impoundment, waste pile, or dedicated site, shall be in accordance with Chapter 62-701, F.A.C. *[62-640.100(6)(b) & (c)]*

9. The permittee shall not be held responsible for treatment and management violations that occur after its biosolids have been accepted by a permitted biosolids treatment facility with which the source facility has an agreement in accordance with subsection 62-640.880(1)(c), F.A.C., for further treatment, management, or disposal. *[62-640.880(1)(b)]*

10. The permittee shall keep hauling records to track the transport of biosolids between the facilities. The hauling records shall contain the following information:

Source Facility
1. Date and time shipped
2. Amount of biosolids shipped
3. Degree of treatment (if applicable)
4. Name and ID Number of treatment facility
5. Signature of responsible party at source facility
6. Signature of hauler and name of hauling firm

Biosolids Treatment Facility or Treatment Facility
1. Date and time received
2. Amount of biosolids received
3. Name and ID number of source facility
4. Signature of hauler
5. Signature of responsible party at treatment facility

A copy of the source facility hauling records for each shipment shall be provided upon delivery of the biosolids to the biosolids treatment facility or treatment facility. The treatment facility permittee shall report to the Department within 24 hours of discovery any discrepancy in the quantity of biosolids leaving the source facility and arriving at the biosolids treatment facility or treatment facility.

[62-640.880(4)]

11. The permittee shall be responsible for proper treatment, management, and disposition of biosolids accepted from source facilities. *[62-640.880(1)(a)]*

12. The permittee shall enter into a written agreement with each source facility that it intends to receive biosolids from. The agreement shall address the quality and quantity of the biosolids accepted by the permittee. The agreement shall include a statement, signed by the permittee, as to the availability of sufficient permitted capacity to receive the biosolids from the source facility, and indicating that the permittee will continue to operate in compliance with the requirements of its permit. The agreement shall also address responsibility during transport of biosolids between the facilities. The permittee shall submit a copy of this agreement to the Department's Central District Office at least 30 days before transporting biosolids from the source facility to the permittee. *[62-640.880(1)(c)]*

III. GROUND WATER REQUIREMENTS

1. The permittee shall give at least 72-hour notice to the Department's Central District Office, prior to the installation of any monitoring wells. *[62-520.600(6)(h)]*

2. Before construction of new ground water monitoring wells, a soil boring shall be made at each new monitoring well location to properly determine monitoring well specifications such as well depth, screen interval, screen slot, and filter pack. *[62-520.600(6)(g)]*

3. Within 30 days after installation of a monitoring well, the permittee shall submit to the Department's Central District Office well completion reports and soil boring/lithologic logs on the attached DEP Form(s) 62-520.900(3), Monitoring Well Completion Report. *[62-520.600(6)(j) and .900(3)]*

4. All piezometers and monitoring wells not part of the approved ground water monitoring plan shall be plugged and abandoned in accordance with Rule 62-532.500(5), F.A.C., unless future use is intended. *[62-532.500(5)]*

5. For the Part IV land application system(s), all ground water quality criteria specified in Chapter 62-520, F.A.C., shall be met at the edge of the zone of discharge. The zone of discharge for Land Application Site R-002 shall extend horizontally 100 feet from the application site and vertically to the base of the surficial aquifer. *[62-520.200(27)] [62-520.465]*

6. For the Part III Public Access system, all ground water quality criteria specified in Chapter 62-520, F.A.C., shall be met at the edge of the zone of discharge. The zone of discharge shall extend horizontally 100 feet from the application site(s) or to the property boundaries, whichever is less, and vertically to the base of the surficial aquifer. *[62-520.200(27)] [62-520.465]*

7. The ground water minimum criteria specified in Rule 62-520.400 F.A.C., shall be met within the zone of discharge. *[62-520.400 and 62-520.420(4)]*

8. If the concentration for any constituent listed in Permit Condition III.11. and III.13. in the natural background quality of the ground water is greater than the stated maximum, or in the case of pH is also less than the minimum, the representative background quality shall be the prevailing standard. *[62-520.420(2)]*

9. During the period of operation authorized by this permit, the permittee shall continue to sample ground water at the monitoring wells identified in Permit Conditions III.10. and III.12., below in accordance with this permit and the approved ground water monitoring plan prepared in accordance with Rule 62-520.600, F.A.C. *[62-520.600] [62-610.463] [62-610.510]*

10. The following monitoring wells shall be sampled for Reuse System R-001.

Monitoring Well ID	Alternate Well Name and/or Description of Monitoring Location	Latitude	Longitude	Depth (Feet)	Aquifer Monitored	Well Type	New or Existing
MWB-1 GC	Debary Plantation G.C./BW-1 Background monitoring well	28°54' 44"	81°19' 25"	42	Surficial	Background	Existing
MWC-1 GC	Debary Plantation G.C./MW-1 Compliance monitoring well	28°54' 19"	81°19' 18"	44	Surficial	Compliance	Existing
MWC-2 GC	Debary Plantation G.C./MW-2 Compliance monitoring well	28°54' 17"	81°19' 2"	38	Surficial	Compliance	Existing
MWC-3 GC	Debary Plantation G.C./MW-3 Compliance monitoring well	28°54' 9"	81°18' 51"	35	Surficial	Compliance	Existing
MWC-5 GC	Debary Plantation G.C./MW-5 Compliance monitoring well	28°53' 55"	81°19' 12"	52	Surficial	Compliance	Existing
MWC-6 GC	Debary Plantation G.C./MW-6 Compliance monitoring well	28°53' 32"	81°19' 0"	34	Surficial	Compliance	Existing
MWC-7 GC	Debary Plantation G.C./MW-7 Compliance monitoring well	28°54' 15"	81°18' 26"	19	Surficial	Compliance	Existing

[62-520.600] [62-610.463]

11. The following parameters shall be analyzed for each monitoring well identified in Permit Condition III.10.:

Parameter	Compliance Well Limit	Units	Sample Type	Monitoring Frequency
Water Level Relative to NGVD	Report	ft	In Situ	Quarterly
Nitrogen, Nitrate, Total (as N)	10	mg/L	Grab	Quarterly
Solids, Total Dissolved (TDS)	500	mg/L	Grab	Quarterly
Chloride (as Cl)	250	mg/L	Grab	Quarterly
Coliform, Fecal	4	#/100mL	Grab	Quarterly
pH	6.5-8.5	s.u.	Grab	Quarterly
Turbidity	Report	NTU	Grab	Quarterly
Sodium, Total Recoverable	160	mg/L	Grab	Quarterly

[62-520.600(11)(b)] [62-600.670] [62-600.650(3)] [62-520.310(5)]

12. The following monitoring wells shall be sampled for Reuse System R-002 located at Land Application Site RIB-001.

Monitoring Well ID	Alternate Well Name and/or Description of Monitoring Location	Latitude	Longitude	Depth (Feet)	Aquifer Monitored	Well Type	New or Existing
MWB-1	Background well transferred from Four Towns/A-1	28°55' 39"	81°17' 14"	14	Surficial	Background	Existing
MWB-1 TA	Terra Alta/MW-1 Background monitoring well	28°54' 41"	81°18' 49"	20	Surficial	Background	Existing
MWB-4 TA	Terra Alta/MW-4 Background monitoring well	28°54' 41"	81°18' 49"	30	Surficial	Background	Existing
MWC-1 POND	Plant Site Perc Pond MW-1 Compliance	28°54' 25"	81°19' 30"	33	Surficial	Compliance	Existing
MWC-2	Compliance well transferred from Four Towns/A-2	28°55' 37"	81°17' 4"	90	Floridan	Compliance	Existing
MWC-2 POND	Plant Site Perc Pond MW-2 Compliance	28°54' 24"	81°19' 33"	29	Surficial	Compliance	Existing
MWC-2 TA	Terra Alta/MW-2 Compliance monitoring well	28°54' 40"	81°18' 55"	20	Surficial	Compliance	Existing
MWC-3	Compliance well transferred from Four Towns/A-3	28°55' 39"	81°17' 0"	20	Surficial	Compliance	Existing
MWC-3 POND	Plant Site Perc Pond MW-3 Compliance	28°54' 39"	81°19' 27"	30	Surficial	Compliance	Existing
MWC-3 TA	Terra Alta/MW-3 Compliance monitoring well	28°54' 42"	81°18' 55"	20	Surficial	Compliance	Existing
MWC-4 POND	Plant Site Perc Pond MW-4 Compliance	28°54' 42"	81°19' 35"	30	Surficial	Compliance	Existing
MWP-1 POND	Plant Site North Perc Pond MWP-1 Piezometer	28°54' 39"	81°19' 31"	30	Surficial	Piezometer	Existing
MWP-2 POND	Plant Site North Perc Pond MWP-2 Piezometer	28°54' 41"	81°19' 27"	30	Surficial	Piezometer	Existing
MWP-3 POND	Plant Site North Perc Pond MWP-3 Piezometer	28°54' 43"	81°19' 31"	30	Surficial	Piezometer	Existing

[62-520.600] [62-610.510]

13. The following parameters shall be analyzed for each monitoring well identified in Permit Condition III.12.:

Parameter	Compliance Well Limit	Units	Sample Type	Monitoring Frequency
Water Level Relative to NGVD	Report	Ft	In Situ	Quarterly
Nitrogen, Nitrate, Total (as N)	10	mg/L	Grab	Quarterly
Solids, Total Dissolved (TDS)	500	mg/L	Grab	Quarterly
Chloride (as Cl)	250	mg/L	Grab	Quarterly
Coliform, Fecal	4	#/100mL	Grab	Quarterly
pH	6.5-8.5	s.u.	Grab	Quarterly
Turbidity	Report	NTU	Grab	Quarterly
Sodium, Total Recoverable	160	mg/L	Grab	Quarterly

For piezometers, monitoring and reporting is required only for water level information.

[62-520.600(11)(b)] [62-600.670] [62-600.650(3)] [62-520.310(5)]

14. Water levels shall be recorded before evacuating each well for sample collection. Elevation references shall include the top of the well casing and land surface at each well site (NAVD allowable) at a precision of plus or minus 0.01 foot. *[62-520.600(11)(c)] [62-610.463(3)(a)] [62-610.510(3)(b)]*

15. Ground water monitoring wells shall be purged prior to sampling to obtain representative samples. *[62-160.210] [62-600.670(3)]*

16. Analyses shall be conducted on unfiltered samples, unless filtered samples have been approved by the Department's Central District Office as being more representative of ground water conditions. *[62-520.310(5)]*

17. Ground water monitoring test results shall be submitted on Part D of Form 62-620.910(10) in accordance with Permit Condition I.B.8. *[62-520.600(11)(b)] [62-600.670] [62-600.680(1)] [62-620.610(18)]*

18. If any monitoring well becomes inoperable or damaged to the extent that sampling or well integrity may be affected, the permittee shall notify the Department's Central District Office within two business days from discovery, and a detailed written report shall follow within ten days after notification to the Department. The written report shall detail what problem has occurred and remedial measures that have been taken to prevent recurrence or request approval for replacement of the monitoring well. All monitoring well design and replacement shall be approved by the Department's Central District Office before installation. *[62-520.600(6)(l)]*

19. The permittee shall sample the following monitoring well(s): MWC-7 GC for the primary and secondary drinking water parameters included in Rules 62-550.310 and 62-550.320, F.A.C., (except for asbestos and all parameters in Table 5 of Chapter 62-550, F.A.C., other than Di(2-ethylhexyl) adipate and Di(2-ethylhexyl) phthalate). Results of this sampling shall be submitted to the Department's Central District Office with the application for permit renewal. Sampling shall occur no sooner than 180 days before submittal of the renewal application. *[62-520.600(5)(b)]*

IV. ADDITIONAL REUSE AND LAND APPLICATION REQUIREMENTS

A. Part III Public Access System(s)

1. Use of reclaimed water is authorized within the general service area identified in the attached map. The following uses of reclaimed water are authorized within this general service area:

   Business, Commercial and Industrial Parks
   Golf Courses
   Other Landscape Irrigation
   Residential Developments

   [62-620.630(10)(a)]

2. This reuse system includes the following major user(s) of reclaimed water (i.e., using 0.1 MGD or more) and general service area(s):

Site Number	User Name	User Type	Capacity(MGD)	Acreage
PAA-001	DeBary Golf Course	Golf Courses	0.240	88
PAA-002	Saxon Woods Subdivision	Residential Developments	0.242	40
PAA-005	Glen Abbey	Residential Developments	0.310	80
PAA-006	Debary Golf and Country Club	Residential Developments	0.30	86
PAA-007	Spring and Park View/Reserve	Residential Developments	0.269	69
		Total	1.421	376.6

   [62-610.800(5)][62-620.630(10)(b)]

3. New major users of reclaimed water (i.e., using 0.1 MGD or more) may be added to the reuse system using the general permit described in Rule 62-610.890, F.A.C., if the requirements in this rule are complied with. Application for use of this general permit shall be made using Form 62-610.300(4)(a)1. *[62-610.890]*

4. Cross-connections to the potable water system are prohibited. *[62-610.469(7)]*

5. A cross-connection control program shall be implemented and/or remain in effect within the areas where reclaimed water will be provided for use and shall be in compliance with the Rule 62-555.360, F.A.C. *[62-610.469(7)]*

6. The permittee shall conduct inspections within the reclaimed water service area to verify proper connections, to minimize illegal cross-connections, and to verify both the proper use of reclaimed water and that the proper backflow prevention assemblies or devices have been installed and tested. Inspections are required when a customer first connects to the reuse distribution system. Subsequent inspections are required as specified in the cross-connection control and inspection program. *[62-610.469(7)(h)]*

7. If an actual or potential (e.g. no dual check device on residential connections served by a reuse system) cross-connection between the potable and reclaimed water systems is discovered, the permittee shall:

   a. Immediately discontinue potable water and/or reclaimed water service to the affected area if an actual cross-connection is discovered.

   b. If the potable water system is contaminated, clear the potable water lines.

   c. Eliminate the cross-connection and install a backflow prevention device as required by the Rule 62-555.360.F.A.C.

   d. Test the affected area for other possible cross-connections.

   e. Within 24 hours, notify the Department's Central District Office's domestic wastewater and drinking water programs.

   f. Within 5 days of discovery of an actual or potential cross-connection, submit a written report to the Department's Central District Office detailing: a description of the cross-connection, how the cross-connection was discovered, the exact date and time of discovery, approximate time that the cross-connection existed, the location, the cause, steps taken to eliminate the cross-connection, whether reclaimed water was consumed, and reports of possible illness, whether the drinking water system was contaminated and the steps taken to clear the drinking water system, when the cross-connection was eliminated, plan of action for testing for other possible cross-connections in the area, and an evaluation of the cross-connection control and inspection program to ensure that future cross-connections do not occur.

   [62-555.350(3) and 62-555.360][62-620.610(20)]

8. Maximum obtainable separation of reclaimed water lines and potable water lines shall be provided and the minimum separation distances specified in Rule 62-610.469(7), F.A.C., shall be provided. Reuse facilities shall be color coded or marked. Underground piping which is not manufactured of metal or concrete shall be color coded using Pantone Purple 522C using light stable colorants. Underground metal and concrete pipe shall be color coded or marked using purple as the predominant color. *[62-610.469(7)]*

9. In constructing reclaimed water distribution piping, the permittee shall maintain a 75-foot setback distance from a reclaimed water transmission facility to public water supply wells. No setback distances are required to other potable water supply wells or to any nonpotable water supply wells. *[62-610.471(3)]*

10. A setback distance of 75 feet shall be maintained between the edge of the wetted area and potable water supply wells, unless the utility adopts and enforces an ordinance prohibiting potable water supply wells within the reuse service area. No setback distances are required to any nonpotable water supply well, to any surface water, to any developed areas, or to any private swimming pools, hot tubs, spas, saunas, picnic tables, barbecue pits, or barbecue grills. *[62-610.471(1), (2), (5), and (7)]*

11. Reclaimed water shall not be used to fill swimming pools, hot tubs, or wading pools. *[62-610.469(4)]*

12. Low trajectory nozzles, or other means to minimize aerosol formation shall be used within 100 feet from outdoor public eating, drinking, or bathing facilities. *[62-610.471(6)]*

13. A setback distance of 100 feet shall be maintained from indoor aesthetic features using reclaimed water to adjacent indoor public eating and drinking facilities. *[62-610.471(8)]*

14. The public shall be notified of the use of reclaimed water. This shall be accomplished by posting of advisory signs in areas where reuse is practiced, notes on scorecards, or other methods. *[62-610.468(2)]*

15. All new advisory signs and labels on vaults, service boxes, or compartments that house hose bibbs along with all labels on hose bibbs, valves, and outlets shall bear the words "do not drink" and "no beber" along with the equivalent standard international symbol. In addition to the words "do not drink" and "no beber," advisory signs posted at storage ponds and decorative water features shall also bear the words "do not swim" and "no nadar" along with the equivalent standard international symbols. Existing advisory signs and labels shall be retrofitted, modified, or replaced in order to comply with the revised wording requirements. For existing advisory signs and labels this retrofit, modification, or replacement shall occur within 365 days after the date of this permit. For labels on existing vaults, service boxes, or compartments housing hose bibbs this retrofit, modification, or replacement shall occur within 730 days after the date of this permit. *[62-610.468, 62-610.469]*

16. The permittee shall ensure that users of reclaimed water are informed about the origin, nature, and characteristics of reclaimed water; the manner in which reclaimed water can be safely used; and limitations on the use of reclaimed water. Notification is required at the time of initial connection to the reclaimed water distribution system and annually after the reuse system is placed into operation. A description of on-going public notification activities shall be included in the Annual Reuse Report. *[62-610.468(6)]*

17. Routine aquatic weed control and regular maintenance of storage pond embankments and access areas are required. *[62-610.414(8)]*

18. Overflows from emergency discharge facilities on storage ponds shall be reported as abnormal events in accordance with Permit Condition IX.20. *[62-610.800(9)]*

B. Part IV Rapid Infiltration Basins

1. Advisory signs shall be posted around the site boundaries to designate the nature of the project area. *[62-610.518]*

2. The maximum annual average loading rate to the Four Towns RIBs with a total wetted area of 7.3 acres shall be limited to 1.51 inches per day (as applied to the entire bottom area). The maximum annual average loading rate to the Deltona North RIB #3 with a total wetted area of 2.54 acres shall be limited to 2.75 inches per day (as applied to the entire bottom area). The maximum annual average loading rate to the On-site RIBs with a total wetted area of 4.2 acres shall be limited to 2.89 inches per day (as applied to the entire bottom area). The maximum annual average loading rate to the Terra-Alta RIBs with a total wetted area of 3.75 acres shall be limited to 0.98 inches per day (as applied to the entire bottom area). *[62-610.523(3)]*

3. RIBs normally shall be loaded for 7 days and shall be rested for 7 days. Infiltration ponds, basins, or trenches shall be allowed to dry during the resting portion of the cycle.*[62-610.523(4)]*

4. Rapid infiltration basins shall be routinely maintained to control vegetation growth and to maintain percolation capability by scarification or removal of deposited solids. Basin bottoms shall be maintained to be level. *[62-610.523(6) and (7)]*

5. Routine aquatic weed control and regular maintenance of storage pond embankments and access areas are required. *[62-610.514 and 62-610.414]*

6. Overflows from emergency discharge facilities on storage ponds or on infiltration ponds, basins, or trenches shall be reported as abnormal events in accordance with Permit Condition IX.20. *[62-610.800(9)]*

V. OPERATION AND MAINTENANCE REQUIREMENTS

A. Staffing Requirements

1. During the period of operation authorized by this permit, the wastewater facilities shall be operated under the supervision of one or more operators certified in accordance with Chapter 62-602, F.A.C. In accordance with Chapter 62-699, F.A.C., this facility is a Category I, Class B facility and, at a minimum, operators with appropriate certification must be on the site as follows:

   A Class C or higher operator 6 hours/day for 7 days/week. The lead/chief operator must be a Class B operator, or higher.

   [62-620.630(3)][62-699.310] [62-610.462]

2. The lead/chief operator shall be employed at the plant full time. "Full time" shall mean at least 4 days per week, working a minimum of 35 hours per week, including leave time. A licensed operator shall be on-site and in charge of each required shift for periods of required staffing time when the lead/chief operator is not on-site. An operator meeting the lead/chief operator class for the treatment plant shall be available during all periods of plant operation. "Available" means able to be contacted as needed to initiate the appropriate action in a timely manner. *[62-699.311(10), (6) and (1)]*

3. An operator meeting the lead/chief operator class for the plant shall be available during all periods of plant operation. "Available" means able to be contacted as needed to initiate the appropriate action in a timely manner. *[62-699.311(1)]*

B. Capacity Analysis Report and Operation and Maintenance Performance Report Requirements

1. An updated capacity analysis report shall be submitted to the Department annually by April 3 of each year. The updated capacity analysis report shall be prepared in accordance with Rule 62-600.405, F.A.C. *[62-600.405(5)]*

2. The application to renew this permit shall include a detailed operation and maintenance performance report prepared in accordance with Rule 62-600.735, F.A.C. *[62-600.735(1)]*

C. Recordkeeping Requirements

1. The permittee shall maintain the following records and make them available for inspection on the site of the permitted facility.

   a. Records of all compliance monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, including, if applicable, a copy of the laboratory certification showing the certification number of the laboratory, for at least three years from the date the sample or measurement was taken;

   b. Copies of all reports required by the permit for at least three years from the date the report was prepared;

   c. Records of all data, including reports and documents, used to complete the application for the permit for at least three years from the date the application was filed;

   d. Monitoring information, including a copy of the laboratory certification showing the laboratory certification number, related to the residuals use and disposal activities for the time period set forth in Chapter 62-640, F.A.C., for at least three years from the date of sampling or measurement;

   e. A copy of the current permit;

   f. A copy of the current operation and maintenance manual as required by Chapter 62-600, F.A.C.;

   g. A copy of any required record drawings;

   h. Copies of the licenses of the current certified operators;

   i. Copies of the logs and schedules showing plant operations and equipment maintenance for three years from the date of the logs or schedules. The logs shall, at a minimum, include identification of the plant; the signature and license number of the operator(s) and the signature of the person(s) making any entries; date and time in and out; specific operation and maintenance activities, including any preventive maintenance or repairs made or requested; results of tests performed and samples taken, unless documented on a laboratory

sheet; and notation of any notification or reporting completed in accordance with Rule 62-602.650(3), F.A.C. The logs shall be maintained on-site in a location accessible to 24-hour inspection, protected from weather damage, and current to the last operation and maintenance performed; and

j. Records of biosolids quantities, treatment, monitoring, and hauling for at least five years.

[62-620.350, 62-602.650, 62-640.650(4)]

VI. SCHEDULES

1. The permittee is not authorized to discharge to waters of the state after the expiration date of this permit, unless:

   a. The permittee has applied for renewal of this permit at least 180 days before the expiration date of this permit using the appropriate forms listed in Rule 62-620.910, F.A.C., and in the manner established in the Department of Environmental Protection Guide to Permitting Wastewater Facilities or Activities Under Chapter 62-620, F.A.C., including submittal of the appropriate processing fee set forth in Rule 62-4.050, F.A.C.; or

   b. The permittee has made complete the application for renewal of this permit before the permit expiration date.

   [62-620.335(1) - (4)]

VII. INDUSTRIAL PRETREATMENT PROGRAM REQUIREMENTS

1. This facility is not required to have a pretreatment program at this time. *[62-625.500]*

VIII. OTHER SPECIFIC CONDITIONS

1. The permittee shall comply with all conditions and requirements for reuse contained in their consumptive use permit issued by the Water Management District, if such requirements are consistent with Department rules. *[62-610.800(10)]*

2. In the event that the treatment facilities or equipment no longer function as intended, are no longer safe in terms of public health and safety, or odor, noise, aerosol drift, or lighting adversely affects neighboring developed areas at the levels prohibited by Rule 62-600.400(2)(a), F.A.C., corrective action (which may include additional maintenance or modifications of the permitted facilities) shall be taken by the permittee. Other corrective action may be required to ensure compliance with rules of the Department. Additionally, the treatment, management, use or land application of residuals shall not cause a violation of the odor prohibition in Rule 62-296.320(2), F.A.C. *[62-600.410(5) and 62-640.400(6)]*

3. The deliberate introduction of stormwater in any amount into collection/transmission systems designed solely for the introduction (and conveyance) of domestic/industrial wastewater; or the deliberate introduction of stormwater into collection/transmission systems designed for the introduction or conveyance of combinations of storm and domestic/industrial wastewater in amounts which may reduce the efficiency of pollutant removal by the treatment plant is prohibited, except as provided by Rule 62-610.472, F.A.C. *[62-604.130(3)]*

4. Collection/transmission system overflows shall be reported to the Department in accordance with Permit Condition IX. 20. *[62-604.550] [62-620.610(20)]*

5. The operating authority of a collection/transmission system and the permittee of a treatment plant are prohibited from accepting connections of wastewater discharges which have not received necessary pretreatment or which contain materials or pollutants (other than normal domestic wastewater constituents):

   a. Which may cause fire or explosion hazards; or

   b. Which may cause excessive corrosion or other deterioration of wastewater facilities due to chemical action or pH levels; or

c. Which are solid or viscous and obstruct flow or otherwise interfere with wastewater facility operations or treatment; or

d. Which result in the wastewater temperature at the introduction of the treatment plant exceeding 40^{o}C or otherwise inhibiting treatment; or

e. Which result in the presence of toxic gases, vapors, or fumes that may cause worker health and safety problems.

[62-604.130(5)]

6. The treatment facility, storage ponds for Part II systems, rapid infiltration basins, and/or infiltration trenches shall be enclosed with a fence or otherwise provided with features to discourage the entry of animals and unauthorized persons. *[62-610.518(1) and 62-600.400(2)(b)]*

7. Screenings and grit removed from the wastewater facilities shall be collected in suitable containers and hauled to a Department approved Class I landfill or to a landfill approved by the Department for receipt/disposal of screenings and grit. *[62-701.300(1)(a)]*

8. Where required by Chapter 471 or Chapter 492, F.S., applicable portions of reports that must be submitted under this permit shall be signed and sealed by a professional engineer or a professional geologist, as appropriate. *[62-620.310(4)]*

9. The permittee shall provide verbal notice to the Department's Central District Office as soon as practical after discovery of a sinkhole or other karst feature within an area for the management or application of wastewater, wastewater residuals (sludges), or reclaimed water. The permittee shall immediately implement measures appropriate to control the entry of contaminants, and shall detail these measures to the Department's Central District Office in a written report within 7 days of the sinkhole discovery. *[62-620.320(6)]*

10. The permittee shall provide notice to the Department of the following:

    a. Any new introduction of pollutants into the facility from an industrial discharger which would be subject to Chapter 403, F.S., and the requirements of Chapter 62-620, F.A.C., if it were directly discharging those pollutants; and

    b. Any substantial change in the volume or character of pollutants being introduced into that facility by a source which was identified in the permit application and known to be discharging at the time the permit was issued.

    Notice shall include information on the quality and quantity of effluent introduced into the facility and any anticipated impact of the change on the quantity or quality of effluent or reclaimed water to be discharged from the facility.

[62-620.625(2)]

IX. GENERAL CONDITIONS

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are binding and enforceable pursuant to Chapter 403, Florida Statutes. Any permit noncompliance constitutes a violation of Chapter 403, Florida Statutes, and is grounds for enforcement action, permit termination, permit revocation and reissuance, or permit revision. *[62-620.610(1)]*

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviations from the approved drawings, exhibits, specifications, or conditions of this permit constitutes grounds for revocation and enforcement action by the Department. *[62-620.610(2)]*

3. As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of

personal rights, nor authorize any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit or authorization that may be required for other aspects of the total project which are not addressed in this permit. *[62-620.610(3)]*

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title. *[62-620.610(4)]*

5. This permit does not relieve the permittee from liability and penalties for harm or injury to human health or welfare, animal or plant life, or property caused by the construction or operation of this permitted source; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. The permittee shall take all reasonable steps to minimize or prevent any discharge, reuse of reclaimed water, or residuals use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. *[62-620.610(5)]*

6. If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee shall apply for and obtain a new permit. *[62-620.610(6)]*

7. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control, and related appurtenances, that are installed and used by the permittee to achieve compliance with the conditions of this permit. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to maintain or achieve compliance with the conditions of the permit. *[62-620.610(7)]*

8. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit revision, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. *[62-620.610(8)]*

9. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, including an authorized representative of the Department and authorized EPA personnel, when applicable, upon presentation of credentials or other documents as may be required by law, and at reasonable times, depending upon the nature of the concern being investigated, to:

   a. Enter upon the permittee's premises where a regulated facility, system, or activity is located or conducted, or where records shall be kept under the conditions of this permit;

   b. Have access to and copy any records that shall be kept under the conditions of this permit;

   c. Inspect the facilities, equipment, practices, or operations regulated or required under this permit; and

   d. Sample or monitor any substances or parameters at any location necessary to assure compliance with this permit or Department rules.

   [62-620.610(9)]

10. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data, and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except as such use is proscribed by Section 403.111, F.S., or Rule 62-620.302, F.A.C. Such evidence shall only be used to the extent that it is consistent with the Florida Rules of Civil Procedure and applicable evidentiary rules. *[62-620.610(10)]*

11. When requested by the Department, the permittee shall within a reasonable time provide any information required by law which is needed to determine whether there is cause for revising, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also provide to the Department upon request copies of records required by this permit to be kept. If the permittee becomes aware of relevant facts that were not submitted or were incorrect in the permit application or in any report to the

Department, such facts or information shall be promptly submitted or corrections promptly reported to the Department. *[62-620.610(11)]*

12. Unless specifically stated otherwise in Department rules, the permittee, in accepting this permit, agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, F.A.C., shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard. *[62-620.610(12)]*

13. The permittee, in accepting this permit, agrees to pay the applicable regulatory program and surveillance fee in accordance with Rule 62-4.052, F.A.C. *[62-620.610(13)]*

14. This permit is transferable only upon Department approval in accordance with Rule 62-620.340, F.A.C. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department. *[62-620.610(14)]*

15. The permittee shall give the Department written notice at least 60 days before inactivation or abandonment of a wastewater facility or activity and shall specify what steps will be taken to safeguard public health and safety during and following inactivation or abandonment. *[62-620.610(15)]*

16. The permittee shall apply for a revision to the Department permit in accordance with Rules 62-620.300, F.A.C., and the Department of Environmental Protection Guide to Permitting Wastewater Facilities or Activities Under Chapter 62-620, F.A.C., at least 90 days before construction of any planned substantial modifications to the permitted facility is to commence or with Rule 62-620.325(2), F.A.C., for minor modifications to the permitted facility. A revised permit shall be obtained before construction begins except as provided in Rule 62-620.300, F.A.C. *[62-620.610(16)]*

17. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.The permittee shall be responsible for any and all damages which may result from the changes and may be subject to enforcement action by the Department for penalties or revocation of this permit. The notice shall include the following information:

    a. A description of the anticipated noncompliance;

    b. The period of the anticipated noncompliance, including dates and times; and

    c. Steps being taken to prevent future occurrence of the noncompliance.

    [62-620.610(17)]

18. Sampling and monitoring data shall be collected and analyzed in accordance with Rule 62-4.246 and Chapters 62-160, 62-600, and 62-610, F.A.C., and 40 CFR 136, as appropriate.

    a. Monitoring results shall be reported at the intervals specified elsewhere in this permit and shall be reported on a Discharge Monitoring Report (DMR), DEP Form 62-620.910(10), or as specified elsewhere in the permit.

    b. If the permittee monitors any contaminant more frequently than required by the permit, using Department approved test procedures, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

    c. Calculations for all limitations which require averaging of measurements shall use an arithmetic mean unless otherwise specified in this permit.

    d. Except as specifically provided in Rule 62-160.300, F.A.C., any laboratory test required by this permit shall be performed by a laboratory that has been certified by the Department of Health Environmental Laboratory Certification Program (DOH ELCP). Such certification shall be for the matrix, test method and analyte(s) being measured to comply with this permit. For domestic wastewater facilities, testing for parameters listed in Rule 62-160.300(4), F.A.C., shall be conducted under the direction of a certified operator.

e. Field activities including on-site tests and sample collection shall follow the applicable standard operating procedures described in DEP-SOP-001/01 adopted by reference in Chapter 62-160, F.A.C.

f. Alternate field procedures and laboratory methods may be used where they have been approved in accordance with Rules 62-160.220, and 62-160.330, F.A.C.

[62-620.610(18)]

19. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule detailed elsewhere in this permit shall be submitted no later than 14 days following each schedule date. *[62-620.610(19)]*

20. The permittee shall report to the Department's Central District Office any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain: a description of the noncompliance and its cause; the period of noncompliance including exact dates and time, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

    a. The following shall be included as information which must be reported within 24 hours under this condition:
        (1) Any unanticipated bypass which causes any reclaimed water or effluent to exceed any permit limitation or results in an unpermitted discharge,
        (2) Any upset which causes any reclaimed water or the effluent to exceed any limitation in the permit,
        (3) Violation of a maximum daily discharge limitation for any of the pollutants specifically listed in the permit for such notice, and
        (4) Any unauthorized discharge to surface or ground waters.

    b. Oral reports as required by this subsection shall be provided as follows:
        (1) For unauthorized releases or spills of treated or untreated wastewater reported pursuant to subparagraph (a)4. that are in excess of 1,000 gallons per incident, or where information indicates that public health or the environment will be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519, as soon as practical, but no later than 24 hours from the time the permittee becomes aware of the discharge. The permittee, to the extent known, shall provide the following information to the State Watch Office:
            (a) Name, address, and telephone number of person reporting;
            (b) Name, address, and telephone number of permittee or responsible person for the discharge;
            (c) Date and time of the discharge and status of discharge (ongoing or ceased);
            (d) Characteristics of the wastewater spilled or released (untreated or treated, industrial or domestic wastewater);
            (e) Estimated amount of the discharge;
            (f) Location or address of the discharge;
            (g) Source and cause of the discharge;
            (h) Whether the discharge was contained on-site, and cleanup actions taken to date;
            (i) Description of area affected by the discharge, including name of water body affected, if any; and
            (j) Other persons or agencies contacted.
        (2) Oral reports, not otherwise required to be provided pursuant to subparagraph b.1 above, shall be provided to the Department's Central District Office within 24 hours from the time the permittee becomes aware of the circumstances.

    c. If the oral report has been received within 24 hours, the noncompliance has been corrected, and the noncompliance did not endanger health or the environment, the Department's Central District Office shall waive the written report.

[62-620.610(20)]

21. The permittee shall report all instances of noncompliance not reported under Permit Conditions IX.17., IX.18., or IX.19. of this permit at the time monitoring reports are submitted. This report shall contain the same information required by Permit Condition IX.20. of this permit. *[62-620.610(21)]*

22. Bypass Provisions.

    a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment works.

    b. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless the permittee affirmatively demonstrates that:
       (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and
       (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
       (3) The permittee submitted notices as required under Permit Condition IX.22.c. of this permit.

    c. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least 10 days before the date of the bypass. The permittee shall submit notice of an unanticipated bypass within 24 hours of learning about the bypass as required in Permit Condition IX.20. of this permit. A notice shall include a description of the bypass and its cause; the period of the bypass, including exact dates and times; if the bypass has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

    d. The Department shall approve an anticipated bypass, after considering its adverse effect, if the permittee demonstrates that it will meet the three conditions listed in Permit Condition IX.22.b.(1) through (3) of this permit.

    e. A permittee may allow any bypass to occur which does not cause reclaimed water or effluent limitations to be exceeded if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Permit Condition IX.22.b. through d. of this permit.

    [62-620.610(22)]

23. Upset Provisions.

    a. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee.
       (1) An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, careless or improper operation.
       (2) An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of upset provisions of Rule 62-620.610, F.A.C., are met.

    b. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed contemporaneous operating logs, or other relevant evidence that:
       (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
       (2) The permitted facility was at the time being properly operated;
       (3) The permittee submitted notice of the upset as required in Permit Condition IX.20. of this permit; and
       (4) The permittee complied with any remedial measures required under Permit Condition IX.5. of this permit.

    c. In any enforcement proceeding, the burden of proof for establishing the occurrence of an upset rests with the permittee.

    d. Before an enforcement proceeding is instituted, no representation made during the Department review of a claim that noncompliance was caused by an upset is final agency action subject to judicial review.

    [62-620.610(23)]

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

For:
Lu Burson
Environmental Administrator
Permitting and Waste Cleanup Program

PERMIT ISSUANCE DATE: December 6, 2018

Attachment(s):
Discharge Monitoring Report
"Pathogen Monitoring" Form
Map of the General Reuse Service Area

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

When Completed submit this report to: Department of Environmental Protection, 3319 Maguire Blvd, Suite 232, Orlando, FL 32803-3767

PERMITTEE NAME:	Volusia County Water Resources and Utilities	PERMIT NUMBER:	FLA011128-014-DW1P	**DMR effective date:**	February 1, 2019
MAILING ADDRESS:	123 W Indiana Ave			**Expiration date:**	December 5, 2023
	Deland, Florida 32720-	LIMIT:	Final	REPORT FREQUENCY:	Monthly
		CLASS SIZE:	N/A	PROGRAM:	Domestic
FACILITY:	VC/Southwest Regional WWTF-1	MONITORING GROUP NUMBER:	R-001		
LOCATION:	800 Debary Plantation Blvd	MONITORING GROUP DESCRIPTION:	Public Access Reuse System, including Influent		
	Debary, FL 32713-2270	RE-SUBMITTED DMR: ☐			
		NO DISCHARGE FROM SITE: ☐			
COUNTY:	Volusia	MONITORING PERIOD From:	_____ To: _____		
OFFICE:	Central District				

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Flow (Flow to R-001)	Sample Measurement										
PARM Code 50050 Y Mon. Site No. FLW-4	Permit Requirement		1.421 (An.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow to R-001)	Sample Measurement										
PARM Code 50050 1 Mon. Site No. FLW-4	Permit Requirement		Report (Mo.Avg.)	MGD						Continuous	Flow Totalizer
Flow (From City of Sanford)	Sample Measurement										
PARM Code 50050 P Mon. Site No. FLW-7	Permit Requirement		Report (An.Avg.)	MGD						Continuous	Flow Totalizer
Flow (From City of Sanford)	Sample Measurement										
PARM Code 50050 Q Mon. Site No. FLW-7	Permit Requirement		Report (Mo.Avg.)	MGD						Continuous	Flow Totalizer
BOD, Carbonaceous 5 day, 20C	Sample Measurement										
PARM Code 80082 Y Mon. Site No. EFA-1	Permit Requirement					20.0 (An.Avg.)		mg/L		Weekly	16-hr FPC
BOD, Carbonaceous 5 day, 20C	Sample Measurement										
PARM Code 80082 A Mon. Site No. EFA-1	Permit Requirement				60.0 (Max.)	45.0 (Max.Wk.Avg.)	30.0 (Mo.Avg.)	mg/L		Weekly	16-hr FPC

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here):

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: R-001 PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Solids, Total Suspended	Sample Measurement										
PARM Code 00530 B Mon. Site No. EFB-1	Permit Requirement						5.0 (Max.)	mg/L		4 Days/Week	Grab
Coliform, Fecal	Sample Measurement										
PARM Code 74055 A Mon. Site No. EFA-1	Permit Requirement						25 (Max.)	#/100mL		4 Days/Week	Grab
Coliform, Fecal, % less than detection	Sample Measurement										
PARM Code 51005 A Mon. Site No. EFA-1	Permit Requirement				75 (Min.Mo.Total)			percent		4 Days/Week	Calculated
pH	Sample Measurement										
PARM Code 00400 A Mon. Site No. EFA-1	Permit Requirement				6.0 (Min.)		8.5 (Max.)	s.u.		Continuous	Meter
Chlorine, Total Residual (For Disinfection)	Sample Measurement										
PARM Code 50060 A Mon. Site No. EFA-1	Permit Requirement				1.0 (Min.)			mg/L		Continuous	Meter
Solids, Total Suspended	Sample Measurement										
PARM Code 00530 P Mon. Site No. EFB-1	Permit Requirement						Report (Max.)	mg/L		Continuous	Meter
Nitrogen, Total	Sample Measurement										
PARM Code 00600 Y Mon. Site No. EFA-1	Permit Requirement					Report (An.Avg.)		mg/L		Monthly	16-hr FPC
Nitrogen, Total	Sample Measurement										
PARM Code 00600 A Mon. Site No. EFA-1	Permit Requirement						Report (Mo.Avg.)	mg/L		Monthly	16-hr FPC
Phosphorus, Total (as P)	Sample Measurement										
PARM Code 00665 Y Mon. Site No. EFA-1	Permit Requirement					Report (An.Avg.)		mg/L		Monthly	16-hr FPC
Phosphorus, Total (as P)	Sample Measurement										
PARM Code 00665 A Mon. Site No. EFA-1	Permit Requirement						Report (Mo.Avg.)	mg/L		Monthly	16-hr FPC

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: R-001 PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Flow (Flow thru plant)	Sample Measurement										
PARM Code 50050 R Mon. Site No. FLW-1	Permit Requirement		2.341 (An.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow thru plant)	Sample Measurement										
PARM Code 50050 S Mon. Site No. FLW-1	Permit Requirement	Report (Mo.Avg.)	Report (3Mo.Avg.)	MGD						Continuous	Flow Totalizer
Percent Capacity, (TMADF/Permitted Capacity) x 100	Sample Measurement										
PARM Code 00180 1 Mon. Site No. FLW-1	Permit Requirement						Report (Mo.Avg.)	percent		Monthly	Calculated
BOD, Carbonaceous 5 day, 20C (Influent)	Sample Measurement										
PARM Code 80082 G Mon. Site No. INF-1	Permit Requirement						Report (Max.)	mg/L		Weekly	16-hr FPC
Solids, Total Suspended (Influent)	Sample Measurement										
PARM Code 00530 G Mon. Site No. INF-1	Permit Requirement						Report (Max.)	mg/L		Weekly	16-hr FPC

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

When Completed submit this report to: Department of Environmental Protection, 3319 Maguire Blvd, Suite 232, Orlando, FL 32803-3767

PERMITTEE NAME:	Volusia County Water Resources and Utilities	PERMIT NUMBER:	FLA011128-014-DW1P	**DMR effective date:**	February 1, 2019
MAILING ADDRESS:	123 W Indiana Ave			**Expiration date:**	December 6, 2023
	Deland, Florida 32720-	LIMIT:	Final	REPORT FREQUENCY:	Monthly
		CLASS SIZE:	N/A	PROGRAM:	Domestic
FACILITY:	VC/Southwest Regional WWTF-1	MONITORING GROUP NUMBER:	R-002		
LOCATION:	800 Debary Plantation Blvd	MONITORING GROUP DESCRIPTION:	Rapid Infiltration Basins		
	Debary, FL 32713-2270	RE-SUBMITTED DMR: ☐			
		NO DISCHARGE FROM SITE: ☐			
COUNTY:	Volusia	MONITORING PERIOD From:	_____ To: _____		
OFFICE:	Central District				

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Flow (Flow to on-site RIBs)	Sample Measurement										
PARM Code 50050 Y Mon. Site No. FLW-2	Permit Requirement		0.330 (An.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow to on-site RIBs)	Sample Measurement										
PARM Code 50050 1 Mon. Site No. FLW-2	Permit Requirement		Report (Mo.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow to Terra Alta RIBs)	Sample Measurement										
PARM Code 50050 P Mon. Site No. FLW-3	Permit Requirement		0.100 (An.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow to Terra Alta RIBs)	Sample Measurement										
PARM Code 50050 Q Mon. Site No. FLW-3	Permit Requirement		Report (Mo.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow to Four Towns RIBs)	Sample Measurement										
PARM Code 50050 R Mon. Site No. FLW-5	Permit Requirement		0.300 (An.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow to Four Towns RIBs)	Sample Measurement										
PARM Code 50050 S Mon. Site No. FLW-5	Permit Requirement		Report (Mo.Avg.)	MGD						Continuous	Flow Totalizer

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here):

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: R-002 PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Flow (Flow to Deltona North RIB)	Sample Measurement										
PARM Code 50050 T Mon. Site No. FLW-6	Permit Requirement		0.190 (An.Avg.)	MGD						Continuous	Flow Totalizer
Flow (Flow to Deltona North RIB)	Sample Measurement										
PARM Code 50050 U Mon. Site No. FLW-6	Permit Requirement		Report (Mo.Avg.)	MGD						Continuous	Flow Totalizer
BOD, Carbonaceous 5 day, 20C	Sample Measurement										
PARM Code 80082 Y Mon. Site No. EFA-1	Permit Requirement					20.0 (An.Avg.)		mg/L		Weekly	16-hr FPC
BOD, Carbonaceous 5 day, 20C	Sample Measurement										
PARM Code 80082 A Mon. Site No. EFA-1	Permit Requirement				60.0 (Max.)	45.0 (Max.Wk.Avg.)	30.0 (Mo.Avg.)	mg/L		Weekly	16-hr FPC
Solids, Total Suspended	Sample Measurement										
PARM Code 00530 Y Mon. Site No. EFA-1	Permit Requirement					20.0 (An.Avg.)		mg/L		Weekly	16-hr FPC
Solids, Total Suspended	Sample Measurement										
PARM Code 00530 A Mon. Site No. EFA-1	Permit Requirement				60.0 (Max.)	45.0 (Max.Wk.Avg.)	30.0 (Mo.Avg.)	mg/L		Weekly	16-hr FPC
Coliform, Fecal	Sample Measurement										
PARM Code 74055 Y Mon. Site No. EFA-1	Permit Requirement					200 (An.Avg.)		#/100mL		Weekly	Grab
Coliform, Fecal	Sample Measurement										
PARM Code 74055 A Mon. Site No. EFA-1	Permit Requirement					200 (Mo.Geo.Mn.)	800 (Max.)	#/100mL		Weekly	Grab
pH	Sample Measurement										
PARM Code 00400 A Mon. Site No. EFA-1	Permit Requirement				6.0 (Min.)		8.5 (Max.)	s.u.		Continuous	Meter
Chlorine, Total Residual (For Disinfection)	Sample Measurement										
PARM Code 50060 A Mon. Site No. EFA-1	Permit Requirement				0.5 (Min.)			mg/L		Continuous	Meter

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: R-002 PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Nitrogen, Nitrate, Total (as N)	Sample Measurement										
PARM Code 00620 A Mon. Site No. EFA-1	Permit Requirement						12.0 (Max.)	mg/L		Weekly	16-hr FPC
Nitrogen, Total	Sample Measurement										
PARM Code 00600 Y Mon. Site No. EFA-1	Permit Requirement					Report (An.Avg.)		mg/L		Monthly	16-hr FPC
Nitrogen, Total	Sample Measurement										
PARM Code 00600 A Mon. Site No. EFA-1	Permit Requirement						Report (Mo.Avg.)	mg/L		Monthly	16-hr FPC
Phosphorus, Total (as P)	Sample Measurement										
PARM Code 00665 Y Mon. Site No. EFA-1	Permit Requirement					Report (An.Avg.)		mg/L		Monthly	16-hr FPC
Phosphorus, Total (as P)	Sample Measurement										
PARM Code 00665 A Mon. Site No. EFA-1	Permit Requirement						Report (Mo.Avg.)	mg/L		Monthly	16-hr FPC

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

When Completed submit this report to: Department of Environmental Protection, 3319 Maguire Blvd, Suite 232, Orlando, FL 32803-3767

PERMITTEE NAME:	Volusia County Water Resources and Utilities	PERMIT NUMBER:	FLA011128-014-DW1P	**DMR effective date:**	February 1, 2019
MAILING ADDRESS:	123 W Indiana Ave			**Expiration date:**	December 5, 2023
	Deland, Florida 32720-	LIMIT:	Final	REPORT FREQUENCY:	Monthly
		CLASS SIZE:	N/A	PROGRAM:	Domestic
FACILITY:	VC/Southwest Regional WWTF-1	MONITORING GROUP NUMBER:	RMP-Q		
LOCATION:	800 Debary Plantation Blvd	MONITORING GROUP DESCRIPTION:	Biosolids Quantity		
	Debary, FL 32713-2270	RE-SUBMITTED DMR: ☐			
		NO DISCHARGE FROM SITE: ☐			
COUNTY:	Volusia	MONITORING PERIOD From:	_____ To: _____		
OFFICE:	Central District				

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Biosolids Quantity (Transferred)	Sample Measurement										
PARM Code B0007 + Mon. Site No. RMP-1	Permit Requirement		Report (Mo.Total)	dry tons						Monthly	Calculated
Biosolids Quantity (Landfilled)	Sample Measurement										
PARM Code B0008 + Mon. Site No. RMP-1	Permit Requirement		Report (Mo.Total)	dry tons						Monthly	Calculated
Biosolids Quantity (Received)	Sample Measurement										
PARM Code B0002 + Mon. Site No. RMP-1	Permit Requirement		Report (Mo.Total)	dry tons						Monthly	Calculated

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here):

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

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MAILING ADDRESS:	123 W Indiana Ave			**Expiration date:**	December 5, 2023
	Deland, Florida 32720-	LIMIT:	Final	REPORT FREQUENCY:	Annually
		CLASS SIZE:	N/A	PROGRAM:	Domestic
FACILITY:	VC/Southwest Regional WWTF-1	MONITORING GROUP NUMBER:	RWS-A		
LOCATION:	800 Debary Plantation Blvd	MONITORING GROUP DESCRIPTION:	Annual Reclaimed Water or Effluent Analysis		
	Debary, FL 32713-2270	RE-SUBMITTED DMR: ☐			
		NO DISCHARGE FROM SITE: ☐			
		MONITORING NOT REQUIRED:* ☐			
COUNTY:	Volusia	MONITORING PERIOD From:	_____ To: _____		
OFFICE:	Central District				

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Antimony, Total Recoverable (GWS = 6)**	Sample Measurement										
PARM Code 01268 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Arsenic, Total Recoverable (GWS = 10)	Sample Measurement										
PARM Code 00978 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Barium, Total Recoverable (GWS = 2,000)	Sample Measurement										
PARM Code 01009 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Beryllium, Total Recoverable (GWS = 4)	Sample Measurement										
PARM Code 00998 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Cadmium, Total Recoverable (GWS = 5)	Sample Measurement										
PARM Code 01113 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Chromium, Total Recoverable (GWS =100)	Sample Measurement										
PARM Code 01118 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC

*THE "MONITORING NOT REQUIRED" CHECKBOX SHOULD BE SELECTED WHEN A CERTIFICATION STATEMENT IN ACCORDANCE WITH SUBSECTION 62-600.680(2), F.A.C., IS SUBMITTED WITH THIS DMR. SEE CERTIFICATION STATEMENT IN COMMENTS SECTION BELOW.

**GROUND WATER STANDARD (GWS) FOR REFERENCE AND REVIEW ONLY.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here):

☐ NO NEW NON-DOMESTIC WASTEWATER DISCHARGERS HAVE BEEN ADDED TO THE COLLECTION SYSTEM SINCE THE LAST RECLAIMED WATER OR EFFLUENT ANALYSIS WAS CONDUCTED. SIGN AND DATE:

ISSUANCE/REISSUANCE DATE: December 6, 2018
DMR EFFECTIVE DATE: February 1, 2019 - Permit expiration

DEP Form 62-620.910(10), Effective Nov. 29, 1994

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Cyanide, Free (amen. to chlorination)(GWS = 200)	Sample Measurement										
PARM Code 00722 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Fluoride, Total (as F) (GWS = 4.0/2.0)	Sample Measurement										
PARM Code 00951 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Lead, Total Recoverable (GWS = 15)	Sample Measurement										
PARM Code 01114 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Mercury, Total Recoverable (GWS = 2)	Sample Measurement										
PARM Code 71901 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Nickel, Total Recoverable (GWS = 100)	Sample Measurement										
PARM Code 01074 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Nitrogen, Nitrate, Total (as N) (GWS = 10)	Sample Measurement										
PARM Code 00620 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Nitrogen, Nitrite, Total (as N) (GWS = 1)	Sample Measurement										
PARM Code 00615 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Nitrite plus Nitrate, Total 1 det. (as N)(GWS = 10)	Sample Measurement										
PARM Code 00630 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Selenium, Total Recoverable (GWS =50)	Sample Measurement										
PARM Code 00981 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Sodium, Total Recoverable (GWS = 160)	Sample Measurement										
PARM Code 00923 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Thallium, Total Recoverable (GWS = 2)	Sample Measurement										
PARM Code 00982 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
1,1-dichloroethylene (GWS = 7)	Sample Measurement										
PARM Code 34501 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,1,1-trichloroethane (GWS = 200)	Sample Measurement										
PARM Code 34506 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,1,2-trichloroethane (GWS = 5)	Sample Measurement										
PARM Code 34511 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,2-dichloroethane (GWS = 3)	Sample Measurement										
PARM Code 32103 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,2-dichloropropane (GWS = 5)	Sample Measurement										
PARM Code 34541 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,2,4-trichlorobenzene (GWS = 70)	Sample Measurement										
PARM Code 34551 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Benzene (GWS = 1)	Sample Measurement										
PARM Code 34030 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Carbon tetrachloride (GWS = 3)	Sample Measurement										
PARM Code 32102 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Cis-1,2-dichloroethene (GWS = 70)	Sample Measurement										
PARM Code 81686 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Dichloromethane (methylene chloride)(GWS = 5)	Sample Measurement										
PARM Code 03821 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Ethylbenzene (GWS = 700)	Sample Measurement										
PARM Code 34371 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Monochlorobenzene (GWS = 100)	Sample Measurement										
PARM Code 34031 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,2-dichlorobenzene (GWS = 600)	Sample Measurement										
PARM Code 34536 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,4-dichlorobenzene (GWS = 75)	Sample Measurement										
PARM Code 34571 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Styrene, Total (GWS = 100)	Sample Measurement										
PARM Code 77128 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Tetrachloroethylene (GWS = 3)	Sample Measurement										
PARM Code 34475 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Toluene (GWS = 1,000)	Sample Measurement										
PARM Code 34010 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
1,2-trans-dichloroethylene (GWS = 100)	Sample Measurement										
PARM Code 34546 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Trichloroethylene (GWS = 3)	Sample Measurement										
PARM Code 39180 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Vinyl chloride (GWS = 1)	Sample Measurement										
PARM Code 39175 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Xylenes (GWS = 10,000)	Sample Measurement										
PARM Code 81551 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
2,3,7,8-tetrachlorodibenzo-p-dioxin(GWS = 3x10^-5)	Sample Measurement										
PARM Code 34675 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
2,4-dichlorophenoxyacetic acid (GWS = 70)	Sample Measurement										
PARM Code 39730 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Silvex (GWS = 50)	Sample Measurement										
PARM Code 39760 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Alachlor (GWS = 2)	Sample Measurement										
PARM Code 39161 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Atrazine (GWS = 3)	Sample Measurement										
PARM Code 39033 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Benzo(a)pyrene (GWS = 0.2)	Sample Measurement										
PARM Code 34247 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Carbofuran (GWS = 40)	Sample Measurement										
PARM Code 81405 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Chlordane (tech mix. and metabolites)(GWS = 2)	Sample Measurement										
PARM Code 39350 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Dalapon (GWS = 200)	Sample Measurement										
PARM Code 38432 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Bis(2-ethylhexyl)adipate (GWS = 400)	Sample Measurement										
PARM Code 77903 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Bis (2-ethylhexyl) phthalate (GWS = 6)	Sample Measurement										
PARM Code 39100 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Dibromochloropropane (DBCP) (GWS = 0.2)	Sample Measurement										
PARM Code 82625 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Dinoseb (GWS = 7)	Sample Measurement										
PARM Code 30191 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Diquat (GWS = 20)	Sample Measurement										
PARM Code 04443 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Endothall (GWS = 100)	Sample Measurement										
PARM Code 38926 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Endrin (GWS = 2)	Sample Measurement										
PARM Code 39390 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Ethylene dibromide (1,2-dibromoethane)(GWS = 0.02)	Sample Measurement										
PARM Code 77651 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	Grab
Glyphosate (GWS = 0.7)	Sample Measurement										
PARM Code 79743 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Heptachlor (GWS = 0.4)	Sample Measurement										
PARM Code 39410 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Heptachlor epoxide (GWS = 0.2)	Sample Measurement										
PARM Code 39420 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Hexachlorobenzene (GWS = 1)	Sample Measurement										
PARM Code 39700 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Hexachlorocyclopentadiene (GWS = 50)	Sample Measurement										
PARM Code 34386 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Gamma BHC (Lindane) (GWS = 0.2)	Sample Measurement										
PARM Code 39782 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Methoxychlor (GWS = 40)	Sample Measurement										
PARM Code 39480 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Oxamyl (vydate) (GWS = 200)	Sample Measurement										
PARM Code 38865 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Pentachlorophenol (GWS = 1)	Sample Measurement										
PARM Code 39032 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Picloram (GWS = 500)	Sample Measurement										
PARM Code 39720 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Polychlorinated Biphenyls (PCBs)(GWS = 0.5)	Sample Measurement										
PARM Code 39516 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Simazine (GWS = 4)	Sample Measurement										
PARM Code 39055 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Toxaphene (GWS = 3)	Sample Measurement										
PARM Code 39400 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Trihalomethane, Total by summation(GWS = 0.080)	Sample Measurement										
PARM Code 82080 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	Grab
Radium 226 + Radium 228, Total (GWS = 5)	Sample Measurement										
PARM Code 11503 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	pCi/L		Annually	24-hr FPC
Alpha, Gross Particle Activity (GWS = 15)	Sample Measurement										
PARM Code 80045 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	pCi/L		Annually	24-hr FPC
Aluminum, Total Recoverable (GWS = 0.2)	Sample Measurement										
PARM Code 01104 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Chloride (as Cl) (GWS = 250)	Sample Measurement										
PARM Code 00940 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Iron, Total Recoverable (GWS = 0.3)	Sample Measurement										
PARM Code 00980 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Copper, Total Recoverable (GWS = 1,000)	Sample Measurement										
PARM Code 01119 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Manganese, Total Recoverable (GWS = 50)	Sample Measurement										
PARM Code 11123 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: VC/Southwest Regional WWTF-1 MONITORING GROUP NUMBER: RWS-A PERMIT NUMBER: FLA011128-014-DW1P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Silver, Total Recoverable (GWS = 100)	Sample Measurement										
PARM Code 01079 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
Sulfate, Total (GWS = 250)	Sample Measurement										
PARM Code 00945 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Zinc, Total Recoverable (GWS = 5,000)	Sample Measurement										
PARM Code 01094 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	ug/L		Annually	24-hr FPC
pH (GWS = 6.5-8.5)	Sample Measurement										
PARM Code 00400 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	s.u.		Annually	Grab
Solids, Total Dissolved (TDS) (GWS = 500)	Sample Measurement										
PARM Code 70295 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC
Foaming Agents (GWS = 0.5)	Sample Measurement										
PARM Code 01288 P Mon. Site No. RWS-A	Permit Requirement						Report (Max.)	mg/L		Annually	24-hr FPC

DAILY SAMPLE RESULTS - PART B

Permit Number: FLA011128-014-DW1P Facility: VC/Southwest Regional WWTF-1
Monitoring Period From: _____ To: _____

	BOD, Carbonaceous 5 day, 20C mg/L	Chlorine, Total Residual (For Disinfection) mg/L	Coliform, Fecal #/100mL	Nitrogen, Nitrate, Total (as N) mg/L	Nitrogen, Total mg/L	Phosphorus, Total (as P) mg/L	Solids, Total Suspended mg/L	pH s.u. Minimum	pH s.u. maximum	Solids, Total Suspended mg/L Grab
Code	80082	50060	74055	00620	00600	00665	00530	00400	00400	00530
Mon. Site	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFB-1
1										
2										
3										
4										
5										
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22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
Total										
Mo. Avg.										

PLANT STAFFING:

Day Shift Operator Class: _____ Certificate No: _____ Name: _____

Evening Shift Operator Class: _____ Certificate No: _____ Name: _____

Night Shift Operator Class: _____ Certificate No: _____ Name: _____

Lead Operator Class: _____ Certificate No: _____ Name: _____

DAILY SAMPLE RESULTS - PART B

Permit Number: FLA011128-014-DW1P Facility: VC/Southwest Regional WWTF-1
Monitoring Period From: _____ To: _____

	Solids, Total Suspended mg/L Meter	Flow (Flow thru plant) MGD	Flow (Flow to on-site RIBs) MGD	Flow (Flow to Terra Alta RIBs) MGD	Flow (Flow to R-001) MGD	Flow (Flow to Four Towns RIBs) MGD	Flow (Flow to Deltona North RIB) MGD	Flow (From City of Sanford) MGD	BOD, Carbonaceous 5 day, 20C (Influent) mg/L	Solids, Total Suspended (Influent) mg/L
Code	00530	50050	50050	50050	50050	50050	50050	50050	80082	00530
Mon. Site	EFB-1	FLW-1	FLW-2	FLW-3	FLW-4	FLW-5	FLW-6	FLW-7	INF-1	INF-1
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
Total										
Mo. Avg.										

PLANT STAFFING:

Day Shift Operator Class: _____ Certificate No: _____ Name: _____

Evening Shift Operator Class: _____ Certificate No: _____ Name: _____

Night Shift Operator Class: _____ Certificate No: _____ Name: _____

Lead Operator Class: _____ Certificate No: _____ Name: _____

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWB-1 GC
Well Type: Background
Description: DEBARY PLANTATION G.C./BW-1 BACKGROUND

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		Report	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		Report	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		Report	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		Report	#/100mL	Grab	Quarterly				
pH	00400		Report	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		Report	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-1 GC
Well Type: Compliance
Description: DEBARY PLANTATION G.C./MW-1 COMPLIANCE

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-2 GC
Well Type: Compliance
Description: DEBARY PLANTATION G.C./MW-2 COMPLIANCE

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-3 GC
Well Type: Compliance
Description: DEBARY PLANTATION G.C./MW-3 COMPLIANCE

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-5 GC
Well Type: Compliance
Description: DEBARY PLANTATION G.C./MW-5 COMPLIANCE

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-6 GC
Well Type: Compliance
Description: DEBARY PLANTATION G.C./MW-6 COMPLIANCE

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-7 GC
Well Type: Compliance
Description: DEBARY PLANTATION G.C./MW-7 Compliance

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWB-1
Well Type: Background
Description: Background well transferred from Four Towns/A-1

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		Report	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		Report	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		Report	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		Report	#/100mL	Grab	Quarterly				
pH	00400		Report	s.u.	Grab	Quarterly				
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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWB-1 TA
Well Type: Background
Description: TERRA ALTA/MW-1 BACKGROUND MONITOR WELL

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		Report	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		Report	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		Report	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		Report	#/100mL	Grab	Quarterly				
pH	00400		Report	s.u.	Grab	Quarterly				
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Sodium, Total Recoverable	00923		Report	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWB-4 TA
Well Type: Background
Description: TERRA ALTA/MW-4 BACKGROUND MONITOR WELL

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		Report	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		Report	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		Report	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		Report	#/100mL	Grab	Quarterly				
pH	00400		Report	s.u.	Grab	Quarterly				
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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia
Office: Central District

Monitoring Well ID: MWC-1 POND
Well Type: Compliance
Description: Plant Site Perc Pond MW-1 Compliance
Re-submitted DMR: ☐

Report Frequency: Quarterly
Program: Domestic

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-2
Well Type: Compliance
Description: Compliance well transferred from Four Towns/A-2

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia
Office: Central District

Monitoring Well ID: MWC-2 POND
Well Type: Compliance
Description: Plant Site Perc Pond MW-2 Compliance
Report Frequency: Quarterly
Program: Domestic
Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____
Date Sample Obtained: _____
Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-2 TA
Well Type: Compliance
Description: TERRA ALTA/2 COMPLIANCE MONITOR WELL

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-3
Well Type: Compliance
Description: Compliance well transferred from Four Towns/A-3

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia
Office: Central District

Monitoring Well ID: MWC-3 POND
Well Type: Compliance
Description: Plant Site Perc Pond MW-3 Compliance
Report Frequency: Quarterly
Program: Domestic
Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWC-3 TA
Well Type: Compliance
Description: TERRA ALTA/3 COMPLIANCE MONITOR WELL

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia
Office: Central District

Monitoring Well ID: MWC-4 POND
Well Type: Compliance
Description: Plant Site Perc Pond MW-4 Compliance
Report Frequency: Quarterly
Program: Domestic
Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD	82545		Report	ft	In Situ	Quarterly				
Nitrogen, Nitrate, Total (as N)	00620		10	mg/L	Grab	Quarterly				
Solids, Total Dissolved (TDS)	70295		500	mg/L	Grab	Quarterly				
Chloride (as Cl)	00940		250	mg/L	Grab	Quarterly				
Coliform, Fecal	74055		4	#/100mL	Grab	Quarterly				
pH	00400		6.5-8.5	s.u.	Grab	Quarterly				
Turbidity	00070		Report	NTU	Grab	Quarterly				
Sodium, Total Recoverable	00923		160	mg/L	Grab	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Office: Central District

Monitoring Well ID: MWP-1 POND
Well Type: Piezometer
Description: Plant Site North Perc Pond MWP-1 Piezometer

Report Frequency: Quarterly
Program: Domestic

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD[1]	82545		Report	ft	In Situ	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

[1] QU

GROUNDWATER MONITORING REPORT - PART D

Facility Name: VC/Southwest Regional WWTF-1
Permit Number: FLA011128-014-DW1P
County: Volusia

Monitoring Well ID: MWP-2 POND
Well Type: Piezometer
Description: Plant Site North Perc Pond MWP-2 Piezometer

Report Frequency: Quarterly
Program: Domestic

Office: Central District

Re-submitted DMR: ☐

Monitoring Period From: _____ To: _____

Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD[2]	82545		Report	ft	In Situ	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

[2] QU

GROUNDWATER MONITORING REPORT - PART D

Facility Name:	VC/Southwest Regional WWTF-1	Monitoring Well ID:	MWP-3 POND		
Permit Number:	FLA011128-014-DW1P	Well Type:	Piezometer	Report Frequency:	Quarterly
County:	Volusia	Description:	Plant Site North Perc Pond MWP-3 Piezometer	Program:	Domestic
Office:	Central District	Re-submitted DMR:	☐		

Monitoring Period From: _____ To: _____ Date Sample Obtained: _____

Time Sample Obtained: _____

Was the well purged before sampling? ___Yes ___ No

Parameter	PARM Code	Sample Measurement	Permit Requirement	Units	Sample Type	Frequency of Analysis	Detection Limits	Analysis Method	Sampling Equipment Used	Samples Filtered (L/F/N)
Water Level Relative to NGVD[3]	82545		Report	ft	In Situ	Quarterly				

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COMMENTS AND EXPLANATION (Reference all attachments here):

[3] QU

INSTRUCTIONS FOR COMPLETING THE WASTEWATER DISCHARGE MONITORING REPORT

Read these instructions before completing the DMR. Hard copies and/or electronic copies of the required parts of the DMR were provided with the permit. All required information shall be completed in full and typed or printed in ink. A signed, original DMR shall be mailed to the address printed on the DMR by the 28th of the month following the monitoring period. Facilities who submit their DMR(s) electronically through eDMR do not need to submit a hardcopy DMR. The DMR shall not be submitted before the end of the monitoring period.

The DMR consists of three parts--A, B, and D--all of which may or may not be applicable to every facility. Facilities may have one or more Part A's for reporting effluent or reclaimed water data. All domestic wastewater facilities will have a Part B for reporting daily sample results. Part D is used for reporting ground water monitoring well data.

When results are not available, the following codes should be used on parts A and D of the DMR and an explanation provided where appropriate. Note: Codes used on Part B for raw data are different.

CODE	DESCRIPTION/INSTRUCTIONS
ANC	Analysis not conducted.
DRY	Dry Well
FLD	Flood disaster.
IFS	Insufficient flow for sampling.
LS	Lost sample.
MNR	Monitoring not required this period.

CODE	DESCRIPTION/INSTRUCTIONS
NOD	No discharge from/to site.
OPS	Operations were shutdown so no sample could be taken.
OTH	Other. Please enter an explanation of why monitoring data were not available.
SEF	Sampling equipment failure.

When reporting analytical results that fall below a laboratory's reported method detection limits or practical quantification limits, the following instructions should be used, unless indicated otherwise in the permit or on the DMR:

1. Results greater than or equal to the PQL shall be reported as the measured quantity.
2. Results less than the PQL and greater than or equal to the MDL shall be reported as the laboratory's MDL value. These values shall be deemed equal to the MDL when necessary to calculate an average for that parameter and when determining compliance with permit limits.
3. Results less than the MDL shall be reported by entering a less than sign ("<") followed by the laboratory's MDL value, e.g. < 0.001. A value of one-half the MDL or one-half the effluent limit, whichever is lower, shall be used for that sample when necessary to calculate an average for that parameter. Values less than the MDL are considered to demonstrate compliance with an effluent limitation.

PART A -DISCHARGE MONITORING REPORT (DMR)

Part A of the DMR is comprised of one or more sections, each having its own header information. Facility information is preprinted in the header as well as the monitoring group number, whether the limits and monitoring requirements are interim or final, and the required submittal frequency (e.g. monthly, annually, quarterly, etc.). Submit Part A based on the required reporting frequency in the header and the instructions shown in the permit. The following should be completed by the permittee or authorized representative:

Resubmitted DMR: Check this box if this DMR is being re-submitted because there was information missing from or information that needed correction on a previously submitted DMR. The information that is being revised should be clearly noted on the re-submitted DMR (e.g. highlight, circle, etc.)
No Discharge From Site: Check this box if no discharge occurs and, as a result, there are no data or codes to be entered for all of the parameters on the DMR for the entire monitoring group number; however, if the monitoring group includes other monitoring locations (e.g., influent sampling), the "NOD" code should be used to individually denote those parameters for which there was no discharge.
Monitoring Period: Enter the month, day, and year for the first and last day of the monitoring period (i.e. the month, the quarter, the year, etc.) during which the data on this report were collected and analyzed.
Sample Measurement: Before filling in sample measurements in the table, check to see that the data collected correspond to the limit indicated on the DMR (i.e. interim or final) and that the data correspond to the monitoring group number in the header. Enter the data or calculated results for each parameter on this row in the non-shaded area above the limit. Be sure the result being entered corresponds to the appropriate statistical base code (e.g. annual average, monthly average, single sample maximum, etc.) and units. Data qualifier codes are not to be reported on Part A.
No. Ex.: Enter the number of sample measurements during the monitoring period that exceeded the permit limit for each parameter in the non-shaded area. If none, enter zero.
Frequency of Analysis: The shaded areas in this column contain the minimum number of times the measurement is required to be made according to the permit. Enter the actual number of times the measurement was made in the space above the shaded area.
Sample Type: The shaded areas in this column contain the type of sample (e.g. grab, composite, continuous) required by the permit. Enter the actual sample type that was taken in the space above the shaded area.
Signature: This report must be signed in accordance with Rule 62-620.305, F.A.C. Type or print the name and title of the signing official. Include the telephone number where the official may be reached in the event there are questions concerning this report. Enter the date when the report is signed.
Comment and Explanation of Any Violations: Use this area to explain any exceedances, any upset or by-pass events, or other items which require explanation. If more space is needed, reference all attachments in this area.

PART B - DAILY SAMPLE RESULTS

Monitoring Period: Enter the month, day, and year for the first and last day of the monitoring period (i.e. the month, the quarter, the year, etc.) during which the data on this report were collected and analyzed.
Daily Monitoring Results: Transfer all analytical data from your facility's laboratory or a contract laboratory's data sheets for all day(s) that samples were collected. Record the data in the units indicated. Table 1 in Chapter 62-160, F.A.C., contains a complete list of all the data qualifier codes that your laboratory may use when reporting analytical results. However, when transferring numerical results onto Part B of the DMR, only the following data qualifier codes should be used and an explanation provided where appropriate.

CODE	DESCRIPTION/INSTRUCTIONS
<	The compound was analyzed for but not detected.
A	Value reported is the mean (average) of two or more determinations.
J	Estimated value, value not accurate.
Q	Sample held beyond the actual holding time.
Y	Laboratory analysis was from an unpreserved or improperly preserved sample.

To calculate the monthly average, add each reported value to get a total. For flow, divide this total by the number of days in the month. For all other parameters, divide the total by the number of observations.
Plant Staffing: List the name, certificate number, and class of all state certified operators operating the facility during the monitoring period. Use additional sheets as necessary.

PART D - GROUND WATER MONITORING REPORT

Monitoring Period: Enter the month, day, and year for the first and last day of the monitoring period (i.e. the month, the quarter, the year, etc.) during which the data on this report were collected and analyzed.
Date Sample Obtained: Enter the date the sample was taken. Also, check whether or not the well was purged before sampling.
Time Sample Obtained: Enter the time the sample was taken.
Sample Measurement: Record the results of the analysis. If the result was below the minimum detection limit, indicate that. Data qualifier codes are not to be reported on Part D.
Detection Limits: Record the detection limits of the analytical methods used.
Analysis Method: Indicate the analytical method used. Record the method number from Chapter 62-160 or Chapter 62-601, F.A.C., or from other sources.
Sampling Equipment Used: Indicate the procedure used to collect the sample (e.g. airlift, bucket/bailer, centrifugal pump, etc.)
Samples Filtered: Indicate whether the sample obtained was filtered by laboratory (L), filtered in field (F), or unfiltered (N).
Signature: This report must be signed in accordance with Rule 62-620.305, F.A.C. Type or print the name and title of the signing official. Include the telephone number where the official may be reached in the event there are questions concerning this report. Enter the date when the report is signed.
Comments and Explanation: Use this space to make any comments on or explanations of results that are unexpected. If more space is needed, reference all attachments in this area.

SPECIAL INSTRUCTIONS FOR LIMITED WET WEATHER DISCHARGES

Flow (Limited Wet Weather Discharge): Enter the measured average flow rate during the period of discharge or divide gallons discharged by duration of discharge (converted into days). Record in million gallons per day (MGD).
Flow (Upstream): Enter the average flow rate in the receiving stream upstream from the point of discharge for the period of discharge. The average flow rate can be calculated based on two measurements; one made at the start and one made at the end of the discharge period. Measurements are to be made at the upstream gauging station described in the permit.
Actual Stream Dilution Ratio: To calculate the Actual Stream Dilution Ratio, divide the average upstream flow rate by the average discharge flow rate. Enter the Actual Stream Dilution Ratio accurate to the nearest 0.1.
No. of Days the SDF > Stream Dilution Ratio: For each day of discharge, compare the minimum Stream Dilution Factor (SDF) from the permit to the calculated Stream Dilution Ratio. On Part B of the DMR, enter an asterisk (*) if the SDF is greater than the Stream Dilution Ratio on any day of discharge. On Part A of the DMR, add up the days with an "*" and record the total number of days the Stream Dilution Factor was greater than the Stream Dilution Ratio.
$CBOD_5$: Enter the average $CBOD_5$ of the reclaimed water discharged during the period shown in duration of discharge.
TKN: Enter the average TKN of the reclaimed water discharged during the period shown in duration of discharge.
Actual Rainfall: Enter the actual rainfall for each day on Part B. Enter the actual cumulative rainfall to date for this calendar year and the actual total monthly rainfall on Part A. The cumulative rainfall to date for this calendar year is the total amount of rain, in inches, that has been recorded since January 1 of the current year through the month for which this DMR contains data.
Rainfall During Average Rainfall Year: On Part A, enter the total monthly rainfall during the average rainfall year and the cumulative rainfall for the average rainfall year. The cumulative rainfall for the average rainfall year is the amount of rain, in inches, which fell during the average rainfall year from January through the month for which this DMR contains data.
No. of Days LWWD Activated During Calendar Year: Enter the cumulative number of days that the limited wet weather discharge was activated since January 1 of the current year.
Reason for Discharge: Attach to the DMR a brief explanation of the factors contributing to the need to activate the limited wet weather discharge.

STATEMENT OF BASIS
FOR
STATE OF FLORIDA DOMESTIC WASTEWATER FACILITY PERMIT

PERMIT NUMBER: FLA011128-014

FACILITY NAME: VCUD/Southwest Regional

FACILITY LOCATION: 800 Debary Plantation Blvd, Debary, FL 32713-2270
Volusia County

NAME OF PERMITTEE: Volusia County Water Resources and Utilities

PERMIT WRITER: Wilmott Brown

1. SUMMARY OF APPLICATION

a. Chronology of Application

Application Number: FLA011128-014-DW1P

Application Submittal Date: March 13, 2018

b. Type of Facility

Domestic Wastewater Treatment Plant

Ownership Type: County

SIC Code: 4952

c. Facility Capacity

Existing Permitted Capacity:	1.7 mgd Annual Average Daily Flow
Proposed Increase in Permitted Capacity:	0.641 mgd Annual Average Daily Flow
Proposed Total Permitted Capacity:	2.341 mgd Annual Average Daily Flow

d. Description of Wastewater Treatment

An existing 2.341 million gallon per day (mgd) annual average daily flow (AADF) permitted capacity domestic wastewater treatment plant (2.70 mgd design capacity) consisting of influent screening, aeration, secondary clarification, chemical feed facilities, filtration, chlorination and aerobic digestion of biosolids. The treatment facility includes an Upflow Sludge Blanket Filtration (USBF) treatment process (treatment train #3) and Orbal Treatment Train (treatment trains # 1 and 2), using the 5 stage Bardenpho process. The USBF structure was built to house three parallel 0.5 MGD AADF treatment basins, however only one of the basins is equipped at this time (0.7 MGD AADF). Facilities also include electronic sensors and automatic diversion valves, on-site 4.5 million gallon (total) (MG) reclaimed water/wet weather ground storage tanks (2 tanks) and high service pump station, and a standby diesel-powered generator. After the proposed Biological Nutrient Removal (BNR) improvements were made (2018), the design capacity of the facility is 2.7 mgd AADF (1.0 mgd treatment train no. 1, 1.0 mgd treatment train no. 2, and 0.7 mgd treatment train no. 3), with the permitted capacity limited to 2.341 mgd, the capacity of the reuse system.

e. Description of Effluent Disposal and Land Application Sites

Land Application R-001: An existing 1.421 MGD annual average daily flow permitted capacity slow-rate public access system. R-001 is a reuse system which consists of an existing 2.0 MG wet weather storage pond at the DeBary Golf Course, 1.0 MG wet weather storage at the Deltona North Ground Storage tank, 2.0 MG of reject storage in the existing on-site rapid infiltration basins, with return capability to the plant oxidation ditch for proper treatment, and irrigation within the Reuse Service Area.

Land Application R-002: An existing 0.920 MGD annual average daily flow permitted capacity rapid infiltration basin system. R-002 is a reuse system which consists of Four Towns RIBs with a total wetted area of 7.3 acres having a capacity of 0.3 MGD, Deltona North RIB #3 with a total wetted area of 2.54 acres having a capacity of 0.19 MGD, On-site RIBs with a total wetted area of 4.2 acres having a capacity of 0.33 MGD, and Terra-Alta RIBs with a total wetted area of 3.75 acres having a capacity of 0.1 MGD.

2. SUMMARY OF SURFACE WATER DISCHARGE

This facility does not discharge to surface waters.

3. BASIS FOR PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

This facility is authorized to direct reclaimed water to Reuse System R-001, a slow-rate public access system, based on the following:

Parameter	Units	Max/ Min	Limit	Statistical Basis	Rationale
Flow (Flow to R-001)	MGD	Max	1.421	Annual Average	62-600.700(2)(b) & 62-610.810(5) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) & 62-610.810(5) FAC
Flow (From City of Sanford)	MGD	Max	Report	Annual Average	62-600.400(3)(b) and 62-610.810(5) FAC
		Max	Report	Monthly Average	62-600.400(3)(b) and 62-610.810(5) FAC
BOD, Carbonaceous 5 day, 20C	mg/L	Max	20.0	Annual Average	62-610.460 & 62-600.420(3)(a)1. FAC
		Max	30.0	Monthly Average	62-610.460 & 62-600.420(3)(a)2. FAC
		Max	45.0	Weekly Average	62-610.460 & 62-600.420(3)(a)3. FAC
		Max	60.0	Single Sample	62-610.460 & 62-600.420(3)(a)4. FAC
Solids, Total Suspended	mg/L	Max	5.0	Single Sample	62-610.460(1) & 62-600.440(6)(a)3. FAC
Coliform, Fecal	#/100mL	Max	25	Single Sample	62-610.460 & 62-600.440(6)(a)2. FAC
Coliform, Fecal, % less than detection	percent	Min	75	Monthly Total	62-610.460 & 62-600.440(6)(a)1. FAC
pH	s.u.	Min	6.0	Single Sample	62-600.445 FAC
		Max	8.5	Single Sample	62-600.445 FAC
Chlorine, Total Residual (For Disinfection)	mg/L	Min	1.0	Single Sample	62-600.440(6)(b), 62-610.460(2), & 62-610.463(2) FAC
Solids, Total Suspended	mg/L	Max	Report	Single Sample	62-610.463(2) FAC
Giardia	cysts/100L	Max	Report	Single Sample	62-610.463(4) FAC
Cryptosporidium	oocysts/100L	Max	Report	Single Sample	62-610.463(4) FAC
Nitrogen, Total	mg/L	Max	Report	Annual Average	62-600.650(3) FAC

Parameter	Units	Max/ Min	Limit	Statistical Basis	Rationale
		Max	Report	Monthly Average	62-600.650(3) FAC
Phosphorus, Total (as P)	mg/L	Max	Report	Annual Average	62-600.650(3) FAC
		Max	Report	Monthly Average	62-600.650(3) FAC

This facility is authorized to direct reclaimed water to Reuse System R-002, a rapid infiltration basin system, based on the following:

Parameter	Units	Max/ Min	Limit	Statistical Basis	Rationale
Flow (Flow to on-site RIBs)	MGD	Max	0.330	Annual Average	62-600.700(2)(b) & 62-610.810(5) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) & 62-610.810(5) FAC
Flow (Flow to Terra Alta RIBs)	MGD	Max	0.100	Annual Average	62-600.700(2)(b) & 62-610.810(5) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) & 62-610.810(5) FAC
Flow (Flow to Four Towns RIBs)	MGD	Max	0.300	Annual Average	62-600.700(2)(b) & 62-610.810(5) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) & 62-610.810(5) FAC
Flow (Flow to Deltona North RIB)	MGD	Max	0.190	Annual Average	62-600.700(2)(b) & 62-610.810(5) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) & 62-610.810(5) FAC
BOD, Carbonaceous 5 day, 20C	mg/L	Max	20.0	Annual Average	62-610.510 & 62-600.420(3)(a)1. FAC
		Max	30.0	Monthly Average	62-610.510 & 62-600.420(3)(a)2. FAC
		Max	45.0	Weekly Average	62-610.510 & 62-600.420(3)(a)3. FAC
		Max	60.0	Single Sample	62-610.510 & 62-600.420(3)(a)4. FAC
Solids, Total Suspended	mg/L	Max	20.0	Annual Average	62-610.510 & 62-600.420(3)(b)1. FAC
		Max	30.0	Monthly Average	62-610.510 & 62-600.420(3)(b)2. FAC
		Max	45.0	Weekly Average	62-610.510 & 62-600.420(3)(b)3. FAC
		Max	60.0	Single Sample	62-610.510 & 62-600.420(3)(b)4. FAC
Coliform, Fecal	#/100mL	Max	200	Monthly Geometric Mean	62-610.510 & 62-600.440(5)(a)2. FAC
		Max	200	Annual Average	62-610.510 & 62-600.440(5)(a)1. FAC
		Max	800	Single Sample	62-610.510 & 62-600.440(5)(a)4. FAC
pH	s.u.	Min	6.0	Single Sample	62-600.445 FAC
		Max	8.5	Single Sample	62-600.445 FAC
Chlorine, Total Residual (For Disinfection)	mg/L	Min	0.5	Single Sample	62-610.510 & 62-600.440(5)(c) FAC
Nitrogen, Nitrate, Total (as N)	mg/L	Max	12.0	Single Sample	62-610.510(1) FAC
Nitrogen, Total	mg/L	Max	Report	Annual Average	62-600.650(3) FAC
		Max	Report	Monthly Average	62-600.650(3) FAC
Phosphorus, Total (as P)	mg/L	Max	Report	Annual Average	62-600.650(3) FAC
		Max	Report	Monthly Average	62-600.650(3) FAC

Other Limitations and Monitoring Requirements:

Parameter	Units	Max/ Min	Limit	Statistical Basis	Rationale
	MGD	Max	2.341	Annual Average	62-600.700(2)(b) FAC

Parameter	Units	Max/ Min	Limit	Statistical Basis	Rationale
Flow (Flow thru plant)		Max	Report	Monthly Average	62-600.700(2)(b) FAC
		Max	Report	3-Month Rolling Average	62-600.700(2)(b) FAC
Percent Capacity, (TMADF/Permitted Capacity) x 100	percent	Max	Report	Monthly Average	62-600.405(4) FAC
BOD, Carbonaceous 5 day, 20C (Influent)	mg/L	Max	Report	Single Sample	62-600.660(1) FAC
Solids, Total Suspended (Influent)	mg/L	Max	Report	Single Sample	62-600.660(1) FAC
Monitoring Frequencies and Sample Types	-	-	-	All Parameters	62-600 FAC & 62-699 FAC and/or BPJ of permit writer
Sampling Locations	-	-	-	All Parameters	62-600, 62-610.412, 62-610.463(1), 62-610.568, 62-610.613 FAC and/or BPJ of permit writer

Operator staffing requirements have been reduced to 6 hours/day for 7 days/week, in accordance with Rule 62-610.462(3)(b), F.A.C.

4. DISCUSSION OF CHANGES TO PERMIT LIMITATIONS

The current wastewater permit for this facility FLA011128-014-DW1P is effective on December 6, 2018, and expires on December 5, 2023.

This facility is located in the Primary Focus Area within the Volusia Blue Spring's Basin Management Action Plan (BMAP). The Department may adopt a Basin Management Action Plan (BMAP) for the Volusia Blue Spring's springshed during the life of this permit. Upon adoption, this permit may be revised to incorporate any applicable requirements for wastewater facilities. The facility would have to meet an annual average Total Nitrogen limit of 3.0 mg/L per ***Table 12. WWTF Effluent Standards***, ***Blue Spring Action Plan (BMAP), June 2018.*** [62-620.610(12)]

5. BIOSOLIDS MANAGEMENT REQUIREMENTS

Biosolids generated by this facility may be transferred to Shelly's Environmental Systems or disposed of in a Class I solid waste landfill.

See the table below for the rationale for the biosolids quantities monitoring requirements.

Parameter	Units	Max/ Min	Limit	Statistical Basis	Rationale
Biosolids Quantity (Transferred)	dry tons	Max	Report	Monthly Total	62-640.650(5)(a)1. FAC
Biosolids Quantity (Landfilled)	dry tons	Max	Report	Monthly Total	62-640.650(5)(a)1. FAC
Biosolids Quantity (Received)	dry tons	Max	Report	Monthly Total	62-640.650(5)(a)1. FAC
Monitoring Frequency		All Parameters			62-640.650(5)(a) FAC

6. GROUND WATER MONITORING REQUIREMENTS

Ground water monitoring requirements have been established in accordance with Chapters 62-520, 532, 601, 610, and 620, F.A.C.

Monitoring well MWC-4GC has been removed from the Groundwater Monitoring Plan (GWMP) as it has been dry the last 5 years.

The Four Towns WWTF RIBs shall receive flow from this facility. The monitoring wells for the Four Towns RIBs (MWB-1, MWC-2, and MWC-3) have been included with this permit.

Parameters Arsenic, Cadmium, Chromium, and Lead are currently not included in the GWMP because they are not believed to be present in the effluent. However, if the Department has any reasons in the future to believe that these metals are present in the effluent, they will be added to the Ground Water Monitoring Plan sampling list.

The permittee shall sample the following monitoring well(s): MWC-7GC for the primary and secondary drinking water parameters included in Rules 62-550.310 and 62-550.320, F.A.C., (except for asbestos and all parameters in Table 5 of Chapter 62-550, F.A.C., other than Di(2-ethylhexyl) adipate and Di(2-ethylhexyl) phthalate). Results of this sampling shall be submitted to the Department's Central District Office with the application for permit renewal. Sampling shall occur no sooner than 180 days before submittal of the renewal application. [62-520.600(5)(b)]

Sulfate, Bis (2-ethylhexyl) phthalate (BEHP), and Total Trihalomethane (TTHMs) have been removed from the GWMP. There were no exceedances of these parameters in the groundwater sampled from the monitoring wells, nor in the reclaimed water analysis, during the last permit cycle.

Nitrates are detected in certain monitoring wells near the golf course and most likely due to fertilization of golf course. No nitrate exceedances were detected in the reclaimed water analysis.

7. PERMIT SCHEDULES

There isn’t a schedule in the permit.

8. INDUSTRIAL PRETREATMENT REQUIREMENTS

At this time, the facility is not required to develop an approved industrial pretreatment program. However, the Department reserves the right to require an approved program if future conditions warrant.

9. ADMINISTRATIVE ORDERS (AO) AND CONSENT ORDERS (CO)

This permit is not accompanied by an AO, and the permittee has not entered into a CO with the Department that affects this permit.

10. REQUESTED VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS

No variances were requested for this facility.

11. THE ADMINISTRATIVE RECORD

The administrative record including application, draft permit, fact sheet, public notice (after release), comments received and additional information is available for public inspection during normal business hours at the location specified in item 13. Copies will be provided at a minimal charge per page.

12. PROPOSED SCHEDULE FOR PERMIT ISSUANCE

Notice of Permit Issuance December 6, 2018

13. DEP CONTACT

Additional information concerning the permit and proposed schedule for permit issuance may be obtained during normal business hours from:

Wilmott Brown
Professional Engineer I
wilmott.brown@dep.state.fl.us

Central District Office

3319 Maguire Blvd
Suite 232
Orlando, FL 32803-3767

Telephone No.: (407) 897-4100

Florida Department of Environmental Protection
Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

PATHOGEN MONITORING

Part I - Instructions

1. Completion of this report is required by Rules 62-610.463(4), 62-610.472(3)(d), 62-610.525(13), 62-610.568(11), 62-610.568(12), and 62-610.652(6)(c), F.A.C., for all domestic wastewater facilities that provide reclaimed water to certain types of reuse activities. The schedule for sampling and reporting shall be in accordance with the permit for the facility. If a schedule for sampling or re-sampling is not included in the permit, the following schedule shall apply:

   a. Routine Sampling:

      If sampling is required once every two years, this report shall be submitted on or before November 28 of each even numbered year (2006, 2008, 2010, etc.).

      If sampling is required once every five years, this report shall be submitted with the application for permit renewal.

      If sampling is required quarterly, this report shall be submitted on or before February 28, May 28, August 28, and November 28 of each year.

   b. Subsequent Re-Sampling:

      If subsequent re-sampling is required by Item 9 in Part I of this form, this form shall be submitted for the subsequent re-sampling(s) in accordance with the schedule established in Item 9 in Part I of this form.

2. Submit one copy of this form and a copy of the laboratory's final report for the analysis of *Giardia* and *Cryptosporidium* to each of the following two addresses:

   a. The appropriate DEP district office (attention Domestic Wastewater Program). Addresses for the DEP district offices are available at www.dep.state.fl.us/secretary/dist/default.htm.

   b. DEP Water Reuse Coordinator
      Mail Station 3540
      2600 Blair Stone Road
      Tallahassee, Florida 32399-2400

3. Please type or print legibly.

4. In Part II, Items 7 through 12 need to be completed only if this is the first submittal of this report, if the information in Items 7 through 12 has changed since the last submittal, or if the information in any of these questions has not been previously provided.

5. Part III is to be used when sampling for *Giardia* and *Cryptosporidium* at the treatment plant. Part III is also to be used when sampling for *Giardia* and *Cryptosporidium* in a supplemental water supply (see Rule 62-610.472, F.A.C.).

6. For each sample, record the sample volume obtained in liters.

7. For *Giardia*, record the concentrations in cysts per 100 liters. For *Cryptosporidium*, record the concentrations in oocysts per 100 liters. Sufficient sample volumes shall be collected and processed such that the detection limit is no greater than 5 cysts or oocysts per 100 liters. Detection levels on the order of 1 cyst or oocyst per 100 liters are recommended. If an observation is less than the detection limit, make an entry in the form "<2" (where 2 per 100 liters is the detection limit in this example). The actual detection limit will be dictated by the volumes of sample obtained, filtered, and processed. Do NOT record nondetectable values as zero.

8. EPA Method 1623 or other approved methods for reclaimed water or nonpotable waters, adjusted appropriately to accommodate the detection limit requirements, shall be used. Methods previously allowed for EPA's Information Collection Rule (ICR) shall not be used. The full requirements of the approved method, including quality assurance and quality control, are to be met. Quality assurance and sampling requirements in Chapter 62-160, F.A.C., shall apply.

   Two concentrations of *Giardia* and *Cryptosporidium* shall be recorded on Part III of this form:

   a. Total cysts and oocysts shall be enumerated using EPA Method 1623 or other approved methods.

   b. Potentially viable cysts and oocysts shall be enumerated using the DAPI staining technique contained in EPA Method 1623 or similar enumeration techniques included in other approved methods. Cysts and oocysts that are stained DAPI positive or show internal structure by D.I.C. shall be considered as being potentially viable. If the laboratory reports separate values for DAPI positive and for cysts or oocysts having internal structure, the larger of the two concentrations will be reported as being potentially viable.

9. If the number of potentially viable cysts of *Giardia* reported exceeds 5 per 100 liters, a subsequent sample shall be taken and analyzed using EPA Method 1623 or other approved methods and reported using this form. If the number of potentially viable oocysts of *Cryptosporidium* reported exceeds 22 per 100 liters, a subsequent sample shall be taken and analyzed using EPA Method 1623 or other approved methods and reported using this form. This subsequent sample shall be collected within 90 days of the date the initial sample was taken, analyzed for both *Giardia* and *Cryptosporidium*, and the results of the subsequent analysis shall be submitted to DEP using this form within 60 days of sample collection.

10. Rule 62-160.300, F.A.C., requires that all laboratories generating environmental data for submission to the DEP shall hold certification from the Department of Health's (DOH) Environmental Laboratory Certification Program (ELCP). Certification by the ELCP for analysis of *Giardia* and *Cryptosporidium* using EPA Method 1623 for non-potable waters is required. If other approved methods are used, certification by the ELCP is required for the specific method and for the test matrix. Lists of certified laboratories can be found at www.dep.state.fl.us/labs/cgi-bin/aams/index.asp

11. Samples shall be collected during peak flow periods (normally between the hours of 8:00 a.m. and 6:00 p.m.).

12. Recognizing that concentrations of these pathogens generally increase during the late summer through fall period, it is recommended that utilities sample during the August through October time period.

13. If the wastewater treatment facility uses chlorination for disinfection, samples obtained for analysis of *Giardia* and *Cryptosporidium* shall be dechlorinated.

14. When sampling at the treatment facility, obtain a grab sample for total suspended solids (TSS) that is representative of the water leaving the filters at the treatment facility during the period when pathogen

samples are being obtained. In addition, record the highest turbidity and the lowest total chlorine residual observed during the period when pathogen samples are being obtained.

15. When sampling a supplemental water supply, obtain a grab sample for total suspended solids (TSS) that is representative of the surface water or treated stormwater as it is added to the reclaimed water system. This TSS sample shall be taken during the period when pathogen samples are being obtained. In addition, record the lowest total chlorine residual observed during the period when pathogen samples are being obtained.

Part II - General Information

1. DEP wastewater facility identification number: **FLA011128**

   Wastewater facility name: VC/Southwest Regional WWTF-1

   Permittee name: Volusia County Water Resources and Utilities

2. Person completing this form:

   Name: _____

   Telephone: (_____)_____

   Email address: _____

3. Sampling and analysis:

   Date samples were taken: _____

   Organization collecting the samples: _____

   Was the sample dechlorinated in the field? ☐ Yes ☐ No

   Was the sample refrigerated or kept on ice during shipment to the laboratory? ☐ Yes ☐ No

   Date samples delivered to laboratory: _____

   Date analytical work was done: _____

   Laboratory doing the analysis: _____

   Laboratory's DOH Identification Number: _____

   Approved method used:

   ☐ EPA Method 1623

   ☐ Other approved method: _____

   Contact person at the laboratory: _____

   Email address of the lab contact person: _____

4. Is this the first time that this form has been submitted for the facility?

   ☐ Yes [Please complete Questions 7 through 16.]

   ☐ No [Proceed to Question 5.]

5. Is this a report of "subsequent re-sampling" required by Item 9 in Part I of this form based on concentrations of potentially viable cysts or oocysts in a previous sampling?

☐ No [Proceed to Question 6.]

☐ Yes [Attach a description of any facility or operational changes made to the treatment facilities since the time of the previous sampling and proceed to Question 6.]

6. Has the information requested in Questions 7 through 12 (below) changed since the last submittal of this form?

☐ Yes [Please complete Questions 7 through 16.]

☐ No [Proceed to Questions 13 through 16 of Part II of this form. You do not need to complete Questions 7 through 12.]

7. Type of secondary treatment system:

☐ Conventional activated sludge ☐ Extended aeration

☐ Contact stabilization ☐ Biological nutrient removal (such as Bardenpho)

☐ Other: _____

8. Does this treatment facility nitrify (convert ammonia nitrogen to nitrate)? ☐ Yes ☐ No

9. Filter type:

☐ Deep bed, single media ☐ Deep bed, multiple media

☐ Shallow bed, automatic backwash ☐ Upflow (including Dynasand)

☐ Slow rate sand filter ☐ Diatomaceous earth filter

☐ Fabric filter ☐ Cartridge filter

☐ Membranes (microfiltration, ultrafiltration, membrane bioreactor, reverse osmosis)

☐ Other: _____

10. Filter Media (complete for each type of media provided):

Top layer of media: Media type: _____

Effective size: _____ mm

Uniformity coefficient: _____

Bed depth: _____ inches

Middle layer of media: Media type: _____

Effective size: _____ mm

Uniformity coefficient: _____

Bed depth: _____ inches

Bottom layer of media: Media type: _____

Effective size: _____ mm

Uniformity coefficient: _____

Bed depth: _____ inches

11. Filter backwash water:

☐ Backwash water is returned to the headworks of the treatment plant.

☐ Backwash water is returned to the aeration basin.

☐ Other. Please describe: _____

12. Disinfection system:

☐ Chlorination, gas ☐ Hypochlorite

☐ Chlorine dioxide ☐ Chlorination, other _____

☐ Ultraviolet ☐ Ozone

☐ Other: _____

13. Is chlorine added before the filters? ☐ No ☐ Yes Dose: _____ mg/L

14. During the period that samples were taken, did you add a coagulant, coagulant aid, polyelectrolyte, or other chemical to enhance filtration?

☐ No

☐ Yes. Please list the chemicals being added and their dose.

Chemical 1 - Name: _____ Dose: _____ mg/L

Chemical 2 - Name: _____ Dose: _____ mg/L

Chemical 3 - Name: _____ Dose: _____ mg/L

15. Wastewater treatment plant permitted capacity: _____ MGD

16. Wastewater flow being treated at the time samples were collected: _____ MGD

PART III - PATHOGEN MONITORING REPORT

FACILITY ID: FLA011128
FACILITY NAME: VC/Southwest Regional WWTF-1
FACILITY ADDRESS: 800 Debary Plantation Blvd, Debary, FL 32713-2270
PERMITTEE NAME: Volusia County Water Resources and Utilities
MAILING ADDRESS: 123 W Indiana Ave, Deland, Florida 32720
DATE OF SAMPLING: _____

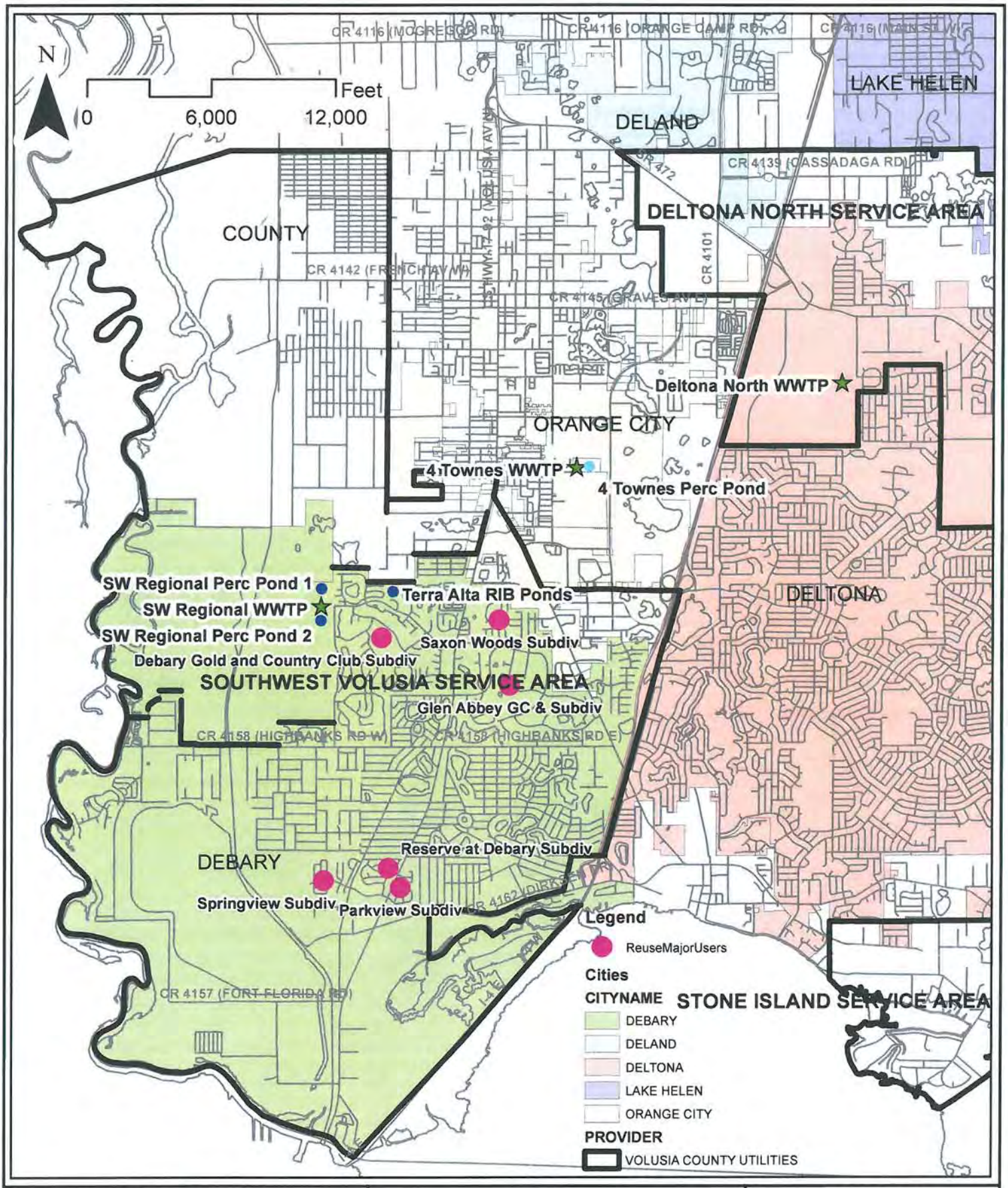
Parameter	Quantity or Loading		Quality or Concentration	
	Sample Measurement	Units	Sample Measurement	Units
Treatment Plant: After Filter Monitoring Site No.				
Turbidity PARM Code 00070				NTU
TSS PARM Code 00530				mg/L
Treatment Plant: After Disinfection Monitoring Site No.				
Total Chlorine Residual PARM Code 50060				mg/L
Volume Collected PARM Code 71994		Liters		
Giardia, total count * PARM Code GIARD				total cysts/100 L
Giardia, potentially viable cysts * PARM Code VGIAR				potentially viable cysts/100 L
Cryptosporidium, total count * PARM Code CRYPT				total oocysts/100 L
Cryptosporidium, potentially viable oocysts * PARM Code VCRYP				potentially viable oocysts/100 L
Supplemental Water Supply (surface water or stormwater): After Treatment & Disinfection Monitoring Site No.				
TSS PARM Code 00530				mg/L
Total Chlorine Residual PARM Code 50060				mg/L
Volume Collected PARM Code 71994		Liters		
Giardia (total count) * PARM Code GIARD				total cysts/100 L
Giardia, potentially viable cysts * PARM Code VGIAR				potentially viable cysts/100 L
Cryptosporidium, total count * PARM Code CRYPT				total oocysts/100 L
Cryptosporidium, potentially viable oocysts * PARM Code VCRYP				potentially viable oocysts/100 L

* Data entries must be made for both total and potentially viable cysts and oocysts.

PART IV - CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based upon my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Name/Title of Principle Executive Officer or Authorized Agent (Type or Print)	Signature of Principle Executive Officer or Authorized Agent	Telephone No.	Date (YY/MM/DD)
	Email Address		



QUENTIN L. HAMPTON ASSOCIATES, INC.
CONSULTING ENGINEERS
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER: 626
FAX: 386.761.3977
P.O. DRAWER 290247 PORT ORANGE, FL 32129-0247
PHONE: 386.761.6810

VOLUSIA COUNTY UTILITIES
SOUTHWEST REGIONAL WRF
OPERATING PERMIT RENEWAL

FIGURE 1-1

WASTEWATER COLLECTION AND RECLAIMED WATER SERVICE AREA MAP

Path: S:\VC\VC107 Wastewater Treatment Plant Operating Permit Renewal FY13\Pub\GIS\VC107 SWR WRF Fig 1-1 Svc Area.mxd

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FDEP UPDATED CAPACITY ANALYSIS REPORT - **DRAFT**
VOLUSIA COUNTY SOUTHWEST #2 WWTF
Facility ID: FLA011121

Exp. June 24, 2027

APRIL 2022

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1. Capacity Analysis Certifications

Permittee's Certification:
We are fully aware and intend to comply with the recommendations and schedules included in this report.

_____

Michael Ulrich
Director Water Resources & Utilities
Volusia County Water Resources and Utilities
123 West Indiana Avenue
DeLand, FL 32720
(386) 943-7027

Lead Operator's Certification:
We are fully aware and intend to comply with the recommendations and schedules included in this report.

_____

Robert D. Beedle
Plant Operations Manager
Volusia County Water Resources and Utilities
3151 East New York Avenue
DeLand, FL 32724
(386) 943-7027
Certification No. 0009628

Engineer's Certification:
The information contained in this report is true and correct to the best of my knowledge. The report was prepared in accordance with sound engineering principles, and the recommendations and schedules were discussed with the permittee or the permittee's delegated representative.

_____

Tonya Sonier, P.E.
Project Manager
Mead & Hunt
4401 Eastport Park Way
Port Orange, FL 32127
Telephone: (321) 750-3128
Florida Registration #84222

2. Facility Background

21 Introduction

This report presents the findings of the evaluation of the Volusia County Southwest #2 Wastewater Treatment Facility (WWTF) as it pertains to capacity analysis. The evaluation was conducted to comply with the requirements of Chapter 62-600.405, Domestic Wastewater Facilities, of the Florida Administrative Code (FAC). The previous capacity analysis report was submitted as part of the most recent operating permit renewal prepared by Quentin Hampton Associates (QLH) in February 2017. The report will evaluate the existing methods utilized at the Southwest #2 WWTF for treatment, management and disposal of wastewater and the sludge generated at this facility. The report details and summarizes the results of the capacity analysis investigation, draws conclusions as to the capability of the individual wastewater treatment components in their ability to meet the required effluent criteria.

22 Site location and Permitting History

The Southwest #2 WWTF is located at 290 Wolf Pack Run Deltona, FL 32725. Located south of DeLand and southwest of New Smyrna Beach, shown in Figure 2-1 below. The facility is a modified activated sludge domestic WWTF permitted to treat 0.60 million gallons per day (MGD) annual average daily flow (AADF). An upgrade to 1.2 MGD was designed but construction was postponed until further development of the I-4 and SR 472 interchange area and demand projections require the plant capacity expansion. The existing permitted plant capacity of 0.60 MGD AADF categorizes the plant as a Type I Facility as defined in Chapter 62-600.200 of the Florida Administrative Code (FAC).

Under the jurisdiction of the Florida Department of Environmental Protection (FDEP), the County currently operates the facility under FDEP Operating Permit No. FLA011121, which was issued June 26, 2017. The operating permit will expire June 24, 2027.

FIGURE 2-1: LOCATION MAP

23 Treatment Process

2.3.1 Pretreatment

The wastewater enters the Southwest #2 WWTF and flows through the pretreatment structure. The pretreatment structure consists of a one (1) manual bar screen prior to discharging into the oxidation ditches.

2.3.2 Oxidation Ditches

The plant has two (2) concentric oxidation ditches. The dimensions and loading rates for each are listed below.

TABLE 2-1: OXIDATION DITCH PARAMETERS

Parameter	Value	Unit
Volume	586,000	Gallons
Design Loading Rate	14	lb BOD/1000 ft^3
Aeration Capacity	2,200	lb O_2 / day
Capacity Utilization	42%	percent

Notes:
(1) Percent utilization is based on flow data provided by the City through November 2021.

The design hydraulic retention time (HRT) for the aerobic facilities at Southwest #2 WWTF is approximately 24 hours, current HRT is approximately 56 hours.

2.3.3 Secondary Clarifiers

The Southwest #2 WWTF treatment plant has two (2) secondary clarifiers. Each is fed independently from the oxidation ditch and delivers clarified effluent to the deep bed sand filters. There are two (2) return activated sludge (RAS) pumps that deliver solids to the oxidation ditch. Typically, one (1) clarifier is operated at a time.

TABLE 2-2: SECONDARY CLARIFIER #1 AND #2 PARAMETERS

Parameter	Value	Unit
Diameter	38	feet
Side Water Depth	14	feet
Surface Area	1,134	square feet
Design Loading Rate	350	gpd/ft^2
Capacity Utilization	31% Each	percent
Return Sludge Pumping Capacity	2 @ 50-300	gpm (each)

Notes:
(1) Percent utilization is based on flow data provided by the City through November 2021.

2.3.4 Chlorine Contact Chamber

The Southwest #2 WWTF has sufficient detention time to adequately reduce fecal coliform in the treatment plant effluent in accordance with high-level disinfection standards. Chlorine injection is accomplished by bulk storage and injection of liquid hypochlorite injection.

TABLE 2-3: CHLORINE CONTACT CHAMBER PARAMETERS

Parameter	Value	Unit
Length	22	feet
Width	42	feet
Depth	5	feet
Volume	4,620 / 34,558	ft^3 / gallons
Detention	30	minutes
Capacity Utilization	30%	percent

Notes:
(1) Percent utilization is based on flow data provided by the City through November 2021.

2.3.5 Effluent Disposal

The plant operating staff selects the effluent disposal system to be utilized. Flow may be diverted to the rapid infiltration basin (RIB) or public access reuse (PAR) water customers.

TABLE 2-4: RIB'S PARAMETERS

Parameter	Value	Unit
Area	7.54	ac
Design Loading Rate	30	inches/week
Effluent Disposal Capacity	0.77	MGD
Capacity Utilization	18%	percent

Notes:
(1) Percent utilization is based on flow data provided by the City through November 2021.
(2) Values are provided the summed totals of all four (4) RIBs

TABLE 2-5: PUBLIC ACCESS REUSE (PAR) PARAMETERS

Parameter	Value	Unit
Area	87	acres
Application Rate	0.8 – 1.0	inches/week
Effluent Disposal Capacity	0.6	MGD
Capacity Utilization	23%	Percent

Notes:
(1) Percent utilization is based on flow data provided by the City through November 2021.
(2) Actual application rates vary
(3) West Volusia Interconnection allows transfer of reclaimed water to and from other utilities in Southwest Volusia County.

2.3.6 Residuals Disposal

All residuals are held in one (1) aerobic digester. Liquid sludge is hauled to the Southwest Regional WWTF for subsequent dewatering and disposal.

TABLE 2-6: AEROBIC DIGESTER PARAMETERS

Parameter	Value	Unit
Diameter	30	ft
Side water Depth	14	ft
Volume	9,896 / 74,000	ft^3 / gallons
Capacity Utilization	47% @ Current Haul Schedule	percent

Notes:
(1) Percent utilization is based on flow data provided by the City through November 2021.

3. Existing Conditions

To characterize present conditions at the Southwest #2 WWTF, the following characteristics of a wastewater treatment plant operation were evaluated:

- Permitted Capacities
- Current and Historical Flow
- Updated Flow and Loading Data

3.1 Permitted Capacities

Under the existing FDEP wastewater operating permit, the Southwest #2 WWTF is authorized to treat a maximum of 0.60 MGD AADF, with effluent flow and concentration limitations presented in **Table 3-1** and **Table 3-2** for both the land application at the four (4) rapid infiltration basins (R-001) and the slow-rate public access system (PAR) (R-002).

TABLE 3-1: RIBS (R-001) EFFLUENT FLOW CONCENTRATION LIMITS

Parameter	Min	Max	Unit	Basis
Flow		0.77	MGD	Annual Average
$CBOD_5$		30.0	mg/L	Monthly Average
TSS		30.0	mg/L	Monthly Average
pH	6.0	8.5	s.u.	Single Sample
Chlorine, Total Residual		0.5	mg/L	Single Sample

Notes:
(1) RIBs permitted flow was increased from 0.58 MGD to 0.77 MGD by FDEP on 2/10/2019 (File No. FLA011121-011-DW1R/MR)

TABLE 3-2: SLOW-RATE PAR (R-002) EFFLUENT FLOW CONCENTRATION LIMITS

Parameter	Min	Max	Unit	Basis
Flow		0.60	MGD	Annual Average
$CBOD_5$		30.0	mg/L	Monthly Average
TSS		5	mg/L	Single Sample
pH	6.0	8.5	s.u.	Single Sample
Chlorine, Total Residual		1.0	mg/L	Single Sample

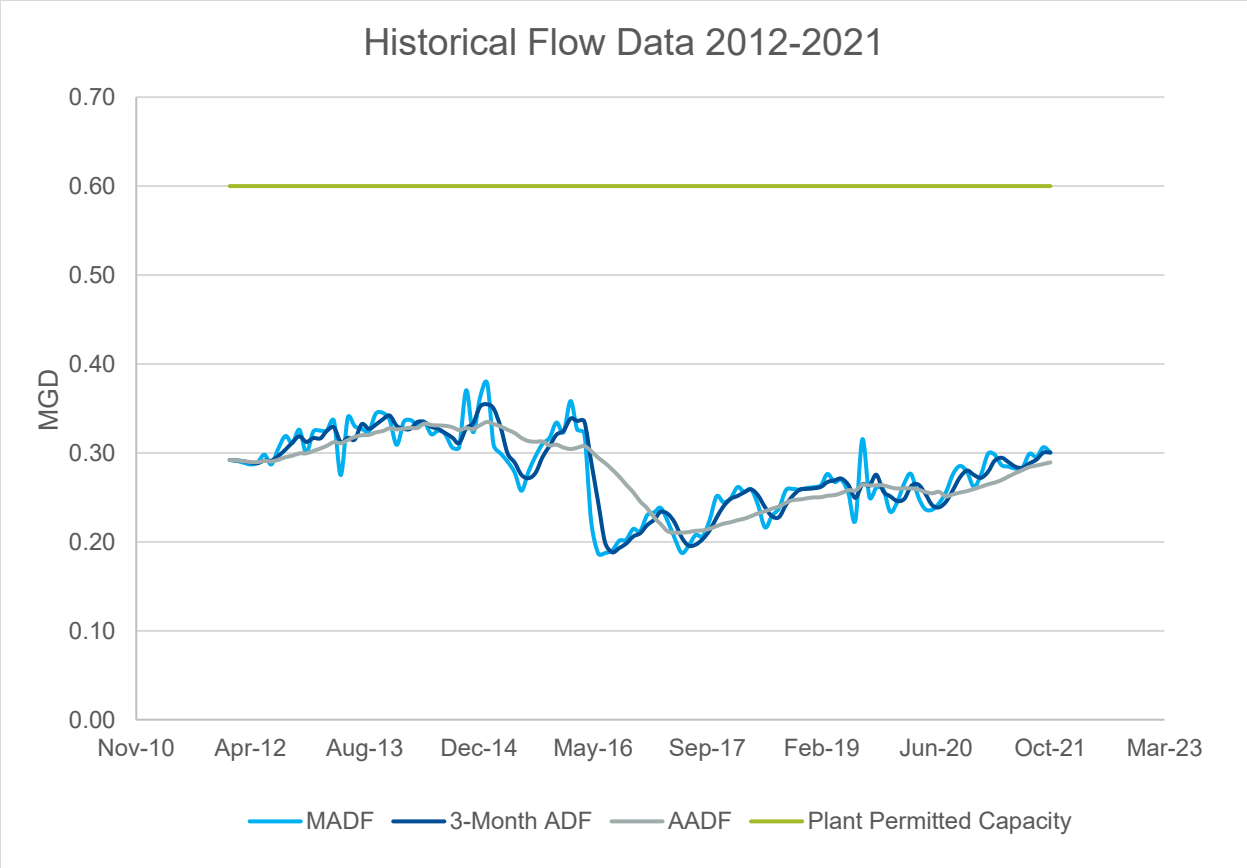
The Southwest #2 WWTF currently has an effluent disposal capacity of 0.77 MGD to the RIBs and of 0.6 MGD for slow-rate PAR, with a cumulative effluent disposal capacity total of 1.37 MGD.

3.2 Current and Historical Flows

In order to analyze recent historical flow patterns, and to satisfy criteria for the Capacity Analysis Report, Type I facilities are required to graphically display historical flow data for the past 10 years. Flow data from January 2012 through November 2021 are compiled and compared to the permitted capacity to review percent of the current capacity being utilized and to assist in projecting flows for the permit duration. Monthly average daily flows and three-month rolling average daily flows were calculated from the Discharge Monitoring Reports (DMRs) and are summarized in the historical flow data table in **Attachment #1**.

Table 3-1 depicts graphically the monthly average daily flows, three-month average daily flows, and average annual daily flow (AADF) for the time of January 2012 through November 2021. The AADF over this ten (10) year period is 0.28 MGD, 47% of the permitted capacity. The maximum 3-month ADF of 0.35 MGD was seen in February 2015 through March 2015. The 3-month ADF has remained well below the permitted limit.

FIGURE 3-1: 2016-2021 HISTORICAL FLOW DATA



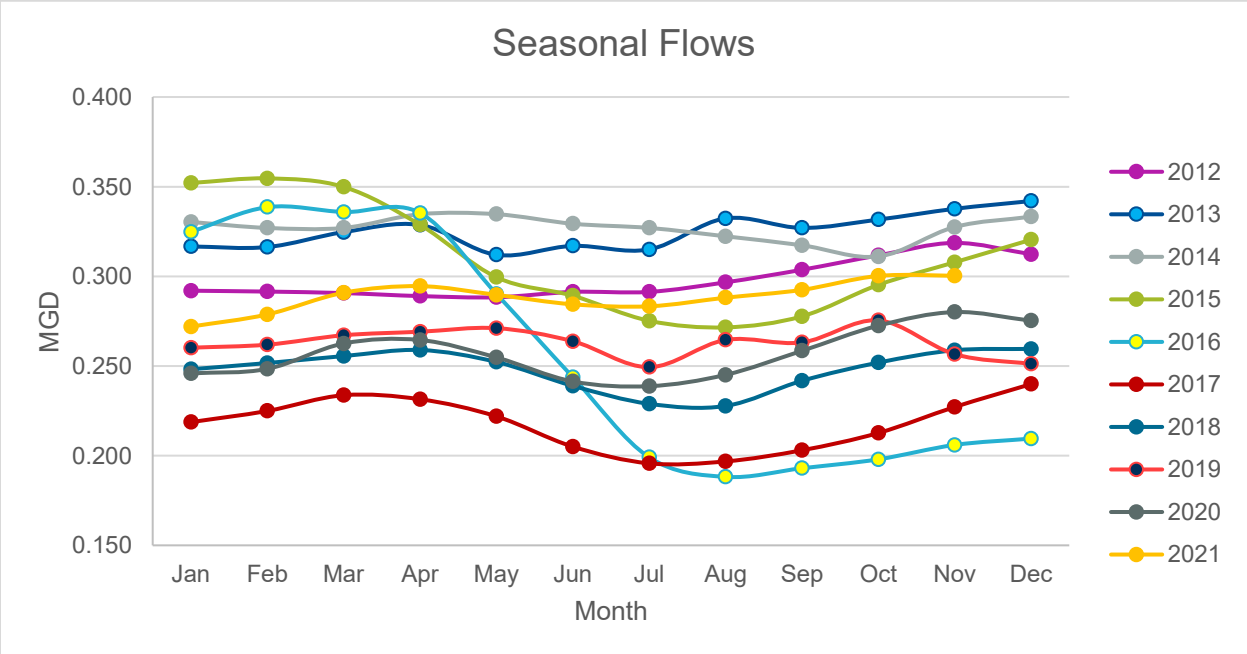
3.3 Seasonal Flow Variations

Table 3-3 and **Figure 3-2** presents three-month rolling averages for the past ten (10) years. The data demonstrates that seasonal low flows typically occur in July & August, while seasonal high is typically seen during the winter months.

TABLE 3-3 SEASONAL FLOWS THROUGH PLANT

	3-Month Rolling Average (MGD)									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
MAX	0.319	0.342	0.335	0.355	0.339	0.240	0.260	0.275	0.280	0.300
MIN	0.288	0.312	0.311	0.272	0.188	0.196	0.228	0.249	0.239	0.272
Jan	0.292	0.317	0.330	0.352	0.325	0.219	0.248	0.260	0.246	0.272
Feb	0.292	0.316	0.327	0.355	0.339	0.225	0.252	0.262	0.248	0.279
Mar	0.291	0.325	0.327	0.350	0.336	0.234	0.256	0.267	0.263	0.291
Apr	0.289	0.329	0.335	0.329	0.335	0.231	0.259	0.269	0.265	0.295
May	0.288	0.312	0.335	0.300	0.290	0.222	0.252	0.271	0.255	0.290
Jun	0.291	0.317	0.329	0.289	0.244	0.205	0.239	0.264	0.241	0.284
Jul	0.291	0.315	0.327	0.275	0.199	0.196	0.229	0.249	0.239	0.283
Aug	0.297	0.332	0.322	0.272	0.188	0.197	0.228	0.265	0.245	0.288
Sep	0.304	0.327	0.317	0.278	0.193	0.203	0.242	0.263	0.258	0.292
Oct	0.312	0.332	0.311	0.295	0.198	0.213	0.252	0.275	0.272	0.300
Nov	0.319	0.338	0.328	0.308	0.206	0.227	0.259	0.257	0.280	0.300
Dec	0.312	0.342	0.333	0.320	0.210	0.240	0.260	0.251	0.275	-

FIGURE 3-2: SEASONAL FLOWS THOUGH PLANT



3.4 Updated Flow & Influent Loading Information

Influent loadings for the past five (5) years were reviewed to evaluate current permit requirements and design values. Influent loading data is based on data reported in the treatment plant's DMRs for January 2016 through October 2021. **Table 3-4** summarizes the flow, $CBOD_5$ and TSS data. All parameter averages and monthly data are within acceptable design values.

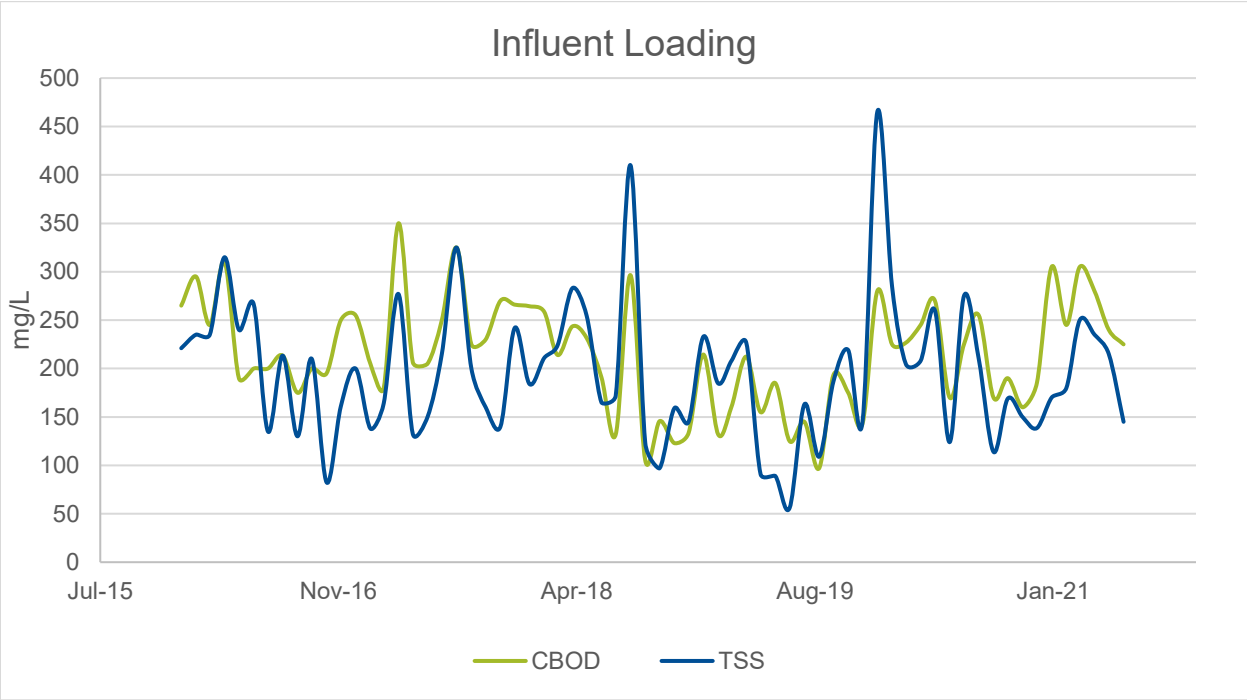
TABLE 3-4: INFLUENT LOADING 2016-2021

MONTH	MONTHLY ADF (MGD)	AVERAGE INFLUENT BOD, CARBONACEOUS 5 DAY, 20C (mg/L)	AVERAGE INFLUENT SOLIDS, TOTAL SUSPENDED (mg/L)
AVERAGE	0.25	215	197
MAX	0.36	350	465
MIN	0.19	97	56
JAN-16	0.32	265	221
FEB-16	0.36	295	235
MAR-16	0.33	245	235
APR-16	0.32	310	315
MAY-16	0.22	190	240
JUN-16	0.19	200	267
JUL-16	0.19	200	135
AUG-16	0.19	213	213
SEP-16	0.20	175	130
OCT-16	0.20	200	210
NOV-16	0.21	195	83
DEC-16	0.21	250	161
JAN-17	0.23	255	200
FEB-17	0.23	205	138
MAR-17	0.24	180	164
APR-17	0.22	350	277
MAY-17	0.20	207	133
JUN-17	0.19	205	150

MONTH	MONTHLY ADF (MGD)	AVERAGE INFLUENT BOD, CARBONACEOUS 5 DAY, 20C (mg/L)	AVERAGE INFLUENT SOLIDS, TOTAL SUSPENDED (mg/L)
JUL-17	0.20	250	215
AUG-17	0.21	325	325
SEP-17	0.21	225	200
OCT-17	0.22	230	160
NOV-17	0.25	270	140
DEC-17	0.24	266	242
JAN-18	0.25	264	184
FEB-18	0.26	259	211
MAR-18	0.26	214	224
APR-18	0.26	244	283
MAY-18	0.24	232	255
JUN-18	0.22	191	165
JUL-18	0.23	132	172
AUG-18	0.24	297	410
SEP-18	0.26	105	123
OCT-18	0.26	146	97
NOV-18	0.26	123	159
DEC-18	0.26	134	145
JAN-19	0.26	215	233
FEB-19	0.26	132	185
MAR-19	0.28	161	208
APR-19	0.27	212	227
MAY-19	0.27	155	91
JUN-19	0.25	185	89
JUL-19	0.22	125	56
AUG-19	0.32	145	163
SEP-19	0.25	97	109

MONTH	MONTHLY ADF (MGD)	AVERAGE INFLUENT BOD, CARBONACEOUS 5 DAY, 20C (mg/L)	AVERAGE INFLUENT SOLIDS, TOTAL SUSPENDED (mg/L)
OCT-19	0.26	193	187
NOV-19	0.26	175	219
DEC-19	0.23	143	145
JAN-20	0.25	280	465
FEB-20	0.27	225	285
MAR-20	0.28	227	205
APR-20	0.25	245	208
MAY-20	0.24	270	260
JUN-20	0.24	170	124
JUL-20	0.24	225	275
AUG-20	0.26	255	210
SEP-20	0.28	170	114
OCT-20	0.29	190	169
NOV-20	0.28	160	150
DEC-20	0.26	185	139
JAN-21	0.28	305	170
FEB-21	0.30	245	180
MAR-21	0.30	305	250
APR-21	0.29	280	235
MAY-21	0.28	240	215
JUN-21	0.28	225	145
JUL-21	0.28	245	187
AUG-21	0.30	110	80
SEP-21	0.30	410	595
OCT-21	0.31	190.5	173
NOV-21	0.30	338	333

FIGURE 3-3: INFLUENT LOADING 2016-2021



4. Population and Flow Projections

4.1 Wastewater Flow Projections

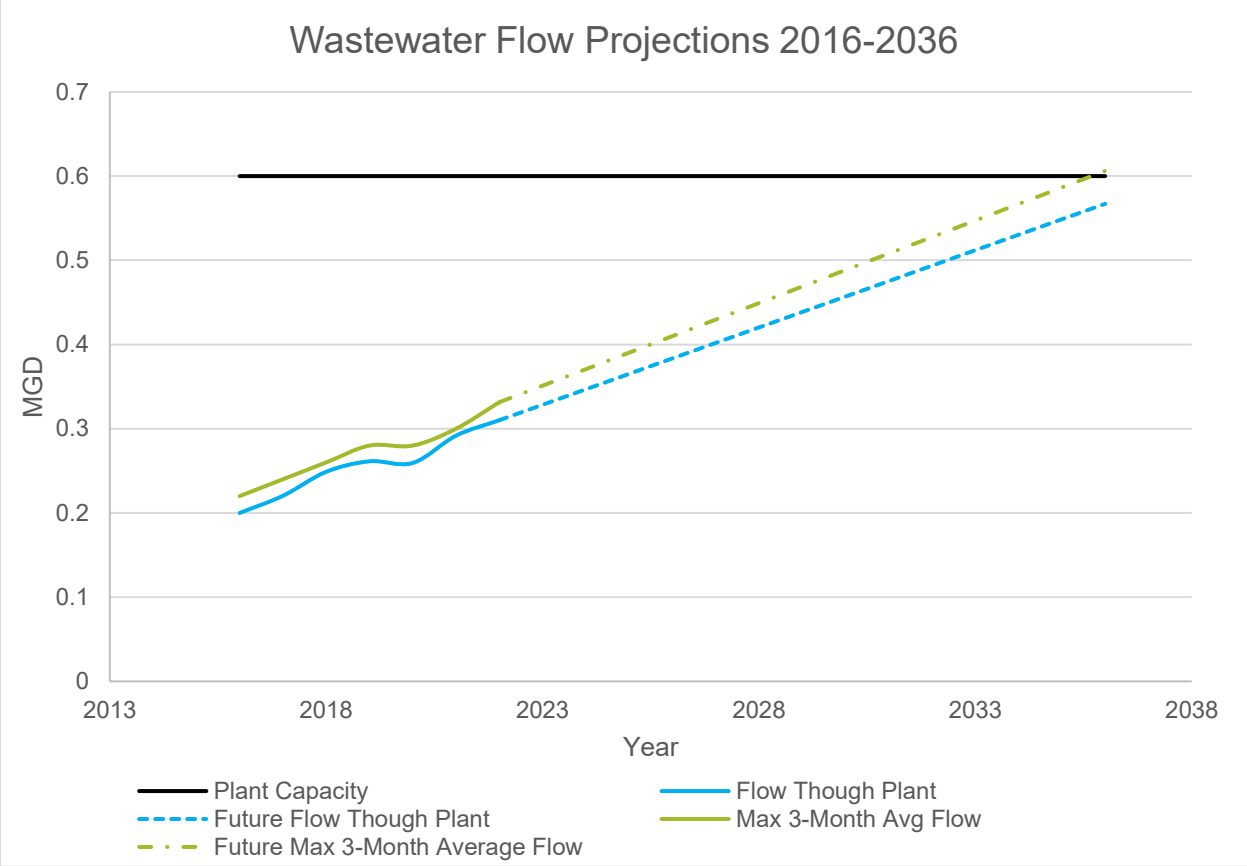
Flow data was obtained from the Southwest #2 WWTF's DMRs for the last 20 years from 2002 through 2021. These DMRs were compiled and compared to the permitted capacity to review percent of the current capacity being utilized and to assist in projecting flows. As seen in the Historical Flow **Table 3-1**, the City of Deltona's new wastewater treatment plant was brought online in May 2016 and diverted approximately 0.13 MGD flow away from Volusia County's Southwest #2 WWTF. Due to this diversion, data from May 2016 through 2021 were utilized to project future wastewater flows.

The average change per year in AADF and the average peak month peak factor (max 3-month average flow:AADF) were calculated to project the wastewater flows. The AADF and max 3-month average were projected from 2022 through 2036, as shown in **Table 4-1** and **Figure 4-1.** Based off these projections, the plant is projected to reach 72% of the permitted capacity by 2027, 88% by 2032 and exceed 100% in 2036 (based on max 3-month average flow). The existing WWTF is anticipated to have adequate capacity to meet projected flows throughout the next permit period.

TABLE 4-1: WASTEWATER FLOW PROJECTIONS

Year	Total Flow Through Plant AADF (MGD)	Change Per Year (MGD)	Max 3 Month Average Flow (MGD)	Peak Month Peak Factor	Percent Plant Capacity
2016	0.200	N/A	0.22	1.10	37%
2017	0.220	0.020	0.24	1.09	40%
2018	0.249	0.028	0.26	1.04	43%
2019	0.261	0.012	0.28	1.07	47%
2020	0.259	-0.002	0.28	1.08	47%
2021	0.292	0.032	0.30	1.03	50%
Historical Averages		0.018	0.26	1.07	44%
2022	0.31	0.018	0.33	1.07	55%
2023	0.33	0.018	0.35	1.07	59%
2024	0.35	0.018	0.37	1.07	62%
2025	0.37	0.018	0.39	1.07	65%
2026	0.38	0.018	0.41	1.07	68%
2027	0.40	0.018	0.43	1.07	72%
2028	0.42	0.018	0.45	1.07	75%
2029	0.44	0.018	0.47	1.07	78%
2030	0.46	0.018	0.49	1.07	81%
2031	0.48	0.018	0.51	1.07	85%
2032	0.49	0.018	0.53	1.07	88%
2033	0.51	0.018	0.55	1.07	91%
2034	0.53	0.018	0.57	1.07	94%
2035	0.55	0.018	0.59	1.07	98%
2036	0.57	0.018	0.61	1.07	101%

FIGURE 4-1: WASTEWATER FLOW PROJECTIONS 2016-2036



4.2 Population Growth

Reviewing current population trends assists a municipality in projecting further growth of the area. The data may be used for planning purposes including projecting future wastewater flows.

To project the population served by the Southwest #2 WWTF, the wastewater flow projections were used from Section 4.1 of this report. An assumption of 200 GPM per equivalent residential unit (ERU) was assumed with an assumption of 2.9 citizens per ERU. Population growth within the Southwest #2 WWTF service area is estimated to increase over the next decade, primarily because of the proposed development near Interstate 4 (I-4). **Table 4-2** presents the projected population for the planning period based on the Southwest #2 service area and population projections.

TABLE 4-2: 10-YEAR POPULATION PROJECTIONS

Year	Population
2019	3,789
2020	3,761
2021	4,231

Year	Population
2022	4,497
2023	4,763
2024	5,029
2025	5,295
2026	5,561
2027	5,827
2028	6,094
2029	6,360
2030	6,626
2031	6,892
2032	7,158

5. Summary and Recommendations

The Southwest #2 WWTF has a rated and permitted capacity of 0.6 MGD. Currently, the plant is operating at an AADF of 0.25 MGD and maximum 3-month average of 0.34 MGD, respectively 42-percent and 57-percent of the permitted plant capacity.

Current process facilities are expected to be sufficient beyond the 5-year operating permit duration. Based upon the information discussed in Section 4 of the report, the maximum 3-month flow is currently estimated to surpass 100-percent of the permitted capacity in the year 2036. There are no recommendations for expansion at this time, however the County should continue to monitor and evaluate their flows and population growth for the following permit renewal in 2027.

ATTACHMENT 1
HISTORICAL FLOW DATA

Month	Monthly ADF (MGD) (FLW-3)	ADF % of Permit Cap.	3-Month ADF (MGD)	Average Annual Daily Flow
Average	0.28	46%	0.28	0.28
Max	0.38	63%	0.35	0.33
Min	0.19	31%	0.19	0.21
Jan-12	0.29	49%	0.29	0.29
Feb-12	0.29	49%	0.29	0.29
Mar-12	0.29	48%	0.29	0.29
Apr-12	0.29	48%	0.29	0.29
May-12	0.29	48%	0.29	0.29
Jun-12	0.30	50%	0.29	0.29
Jul-12	0.29	48%	0.29	0.29
Aug-12	0.31	51%	0.30	0.29
Sep-12	0.32	53%	0.30	0.30
Oct-12	0.31	52%	0.31	0.30
Nov-12	0.33	54%	0.32	0.30
Dec-12	0.30	50%	0.31	0.30
Jan-13	0.32	54%	0.32	0.30
Feb-13	0.33	54%	0.32	0.31
Mar-13	0.33	54%	0.32	0.31
Apr-13	0.34	56%	0.33	0.31
May-13	0.28	46%	0.31	0.31
Jun-13	0.34	57%	0.32	0.31
Jul-13	0.33	55%	0.32	0.32
Aug-13	0.33	55%	0.33	0.32
Sep-13	0.32	54%	0.33	0.32
Oct-13	0.34	57%	0.33	0.32
Nov-13	0.35	58%	0.34	0.32
Dec-13	0.34	56%	0.34	0.33
Jan-14	0.31	52%	0.33	0.33
Feb-14	0.34	56%	0.33	0.33
Mar-14	0.34	56%	0.33	0.33
Apr-14	0.33	55%	0.33	0.33
May-14	0.34	56%	0.33	0.33
Jun-14	0.32	54%	0.33	0.33
Jul-14	0.33	54%	0.33	0.33
Aug-14	0.32	54%	0.32	0.33
Sep-14	0.31	51%	0.32	0.33
Oct-14	0.31	51%	0.31	0.33

Month	Monthly ADF (MGD) (FLW-3)	ADF % of Permit Cap.	3-Month ADF (MGD)	Average Annual Daily Flow
Nov-14	0.37	62%	0.33	0.33
Dec-14	0.32	54%	0.33	0.33
Jan-15	0.36	60%	0.35	0.33
Feb-15	0.38	63%	0.35	0.33
Mar-15	0.31	52%	0.35	0.33
Apr-15	0.30	50%	0.33	0.33
May-15	0.29	48%	0.30	0.33
Jun-15	0.28	46%	0.29	0.32
Jul-15	0.26	43%	0.28	0.32
Aug-15	0.28	47%	0.27	0.31
Sep-15	0.30	49%	0.28	0.31
Oct-15	0.31	52%	0.30	0.31
Nov-15	0.32	53%	0.31	0.31
Dec-15	0.33	56%	0.32	0.31
Jan-16	0.32	54%	0.32	0.31
Feb-16	0.36	60%	0.34	0.30
Mar-16	0.33	54%	0.34	0.31
Apr-16	0.32	54%	0.34	0.31
May-16	0.22	37%	0.29	0.30
Jun-16	0.19	31%	0.24	0.29
Jul-16	0.19	31%	0.20	0.29
Aug-16	0.19	32%	0.19	0.28
Sep-16	0.20	34%	0.19	0.27
Oct-16	0.20	34%	0.20	0.26
Nov-16	0.21	36%	0.21	0.26
Dec-16	0.21	35%	0.21	0.25
Jan-17	0.23	38%	0.22	0.24
Feb-17	0.23	39%	0.22	0.23
Mar-17	0.24	40%	0.23	0.22
Apr-17	0.22	37%	0.23	0.21
May-17	0.20	34%	0.22	0.21
Jun-17	0.19	31%	0.21	0.21
Jul-17	0.20	33%	0.20	0.21
Aug-17	0.21	35%	0.20	0.21
Sep-17	0.21	34%	0.20	0.21
Oct-17	0.22	37%	0.21	0.21
Nov-17	0.25	42%	0.23	0.22
Dec-17	0.24	41%	0.24	0.22
Jan-18	0.25	41%	0.25	0.22

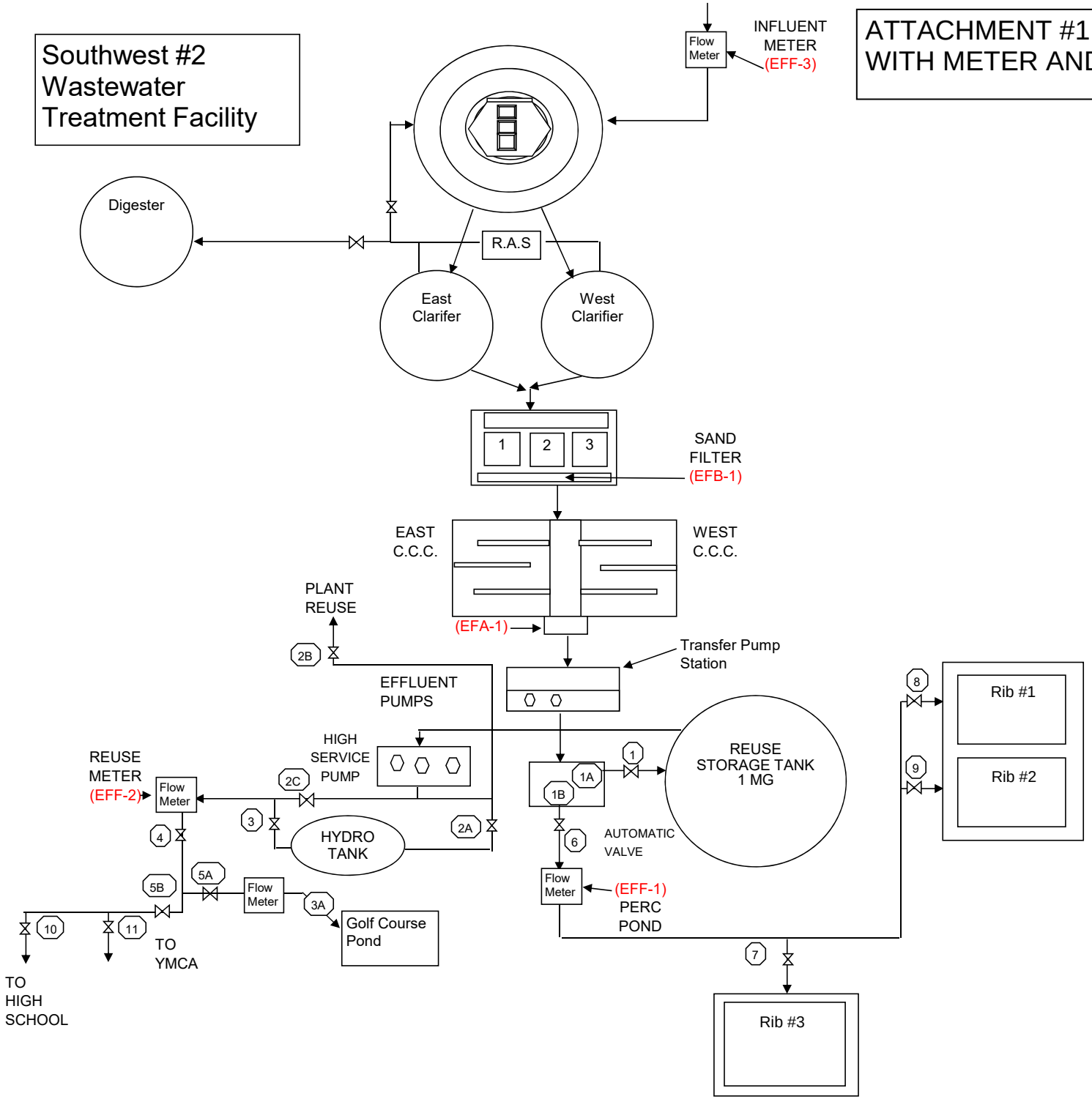
Month	Monthly ADF (MGD) (FLW-3)	ADF % of Permit Cap.	3-Month ADF (MGD)	Average Annual Daily Flow
Feb-18	0.26	44%	0.25	0.22
Mar-18	0.26	43%	0.26	0.23
Apr-18	0.26	43%	0.26	0.23
May-18	0.24	40%	0.25	0.23
Jun-18	0.22	36%	0.24	0.23
Jul-18	0.23	38%	0.23	0.24
Aug-18	0.24	40%	0.23	0.24
Sep-18	0.26	43%	0.24	0.24
Oct-18	0.26	43%	0.25	0.25
Nov-18	0.26	43%	0.26	0.25
Dec-18	0.26	43%	0.26	0.25
Jan-19	0.26	44%	0.26	0.25
Feb-19	0.26	44%	0.26	0.25
Mar-19	0.28	46%	0.27	0.25
Apr-19	0.27	45%	0.27	0.25
May-19	0.27	45%	0.27	0.25
Jun-19	0.25	42%	0.26	0.26
Jul-19	0.22	37%	0.25	0.26
Aug-19	0.32	53%	0.26	0.26
Sep-19	0.25	42%	0.26	0.26
Oct-19	0.26	43%	0.28	0.26
Nov-19	0.26	43%	0.26	0.26
Dec-19	0.23	39%	0.25	0.26
Jan-20	0.25	41%	0.25	0.26
Feb-20	0.27	44%	0.25	0.26
Mar-20	0.28	46%	0.26	0.26
Apr-20	0.25	42%	0.26	0.26
May-20	0.24	40%	0.25	0.26
Jun-20	0.24	39%	0.24	0.25
Jul-20	0.24	41%	0.24	0.26
Aug-20	0.26	43%	0.25	0.25
Sep-20	0.28	46%	0.26	0.25
Oct-20	0.29	48%	0.27	0.26
Nov-20	0.28	46%	0.28	0.26
Dec-20	0.26	44%	0.28	0.26
Jan-21	0.28	46%	0.27	0.26
Feb-21	0.30	50%	0.28	0.26
Mar-21	0.30	50%	0.29	0.27
Apr-21	0.29	48%	0.29	0.27

Month	Monthly ADF (MGD) (FLW-3)	ADF % of Permit Cap.	3-Month ADF (MGD)	Average Annual Daily Flow
May-21	0.28	47%	0.29	0.27
Jun-21	0.28	47%	0.28	0.28
Jul-21	0.28	47%	0.28	0.28
Aug-21	0.30	50%	0.29	0.28
Sep-21	0.30	49%	0.29	0.29
Oct-21	0.31	51%	0.30	0.29
Nov-21	0.30	50%	0.30	0.29

ATTACHMENT 2
PLANT SCHEMATIC AND SITE PLAN

ATTACHMENT #1 PLANT SCHEMATIC WITH METER AND SAMPLING LOCATIONS

Southwest #2 Wastewater Treatment Facility



STP-2 PLANT DIAGRAM.xls

ATTACHMENT 3
PLANT SCHEMATIC AND SITE PLAN

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Attachment #2 Rib Location

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PRELIMINARY DRAFT

Southeast Regional Water Reclamation Facility Capacity Analysis Report

February 2023

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1. Introduction

FDEP Domestic Wastewater Facility Permit – FLA017413

Issuance Date	8/20/2013
Expiration Date	8/19/18
Facility ID	FLA017413
Permittee	Volusia County Utilities Department Michael Ulrich
Address	325 Beacon Light Rd. Oak Hill, FL. 32759
Latitude	28°51' 41.98" N
Longitude	80°52' 13.69" W

Volusia County's Southeast Regional Water Reclamation Facility (WRF) utilizes a biological nutrient removal process. The Orbal process is a plug flow activated sludge process which utilizes aerobic and anaerobic treatment zones to achieve nitrogen and carbonaceous BOD reduction. Filters are provided for the reduction of total suspended solids.

Residuals handling processes include aerobic digestion and dewatering followed by hauling by Shelley's Environmental Systems. A process flow schematic and site plan are provided as Figure 1-1 and Figure 1-2 in this report.

Plant effluent meets public access irrigation standards. All plant effluent is reused as irrigation of the adjacent County-owned citrus grove (all off-spec effluent is sent to a lined reject pond for future re-processing). A total of 94 acres are outfitted with irrigation and can accept up to 2 inches per week.

The County had previously submitted plans and permit applications for expansion of the WRF from 0.6 MGD to 1.2 MGD. This expansion was placed on hold due to a lack of growth in the service area.

Plans to expand the SERWRF from 0.6 MGD to 1.2 MGD have since picked up again, with completed construction estimated to be in 2025.

PROCESS FLOW DIAGRAM

EXHIBIT 2

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VOLUSIA COUNTY
S.E. REGIONAL W.R.F.
OPERATING PERMIT RENEWAL

CLIENT PROJECT #
2769600-172127.01
DELAND, FLORIDA 32720

Volusia County
FLORIDA

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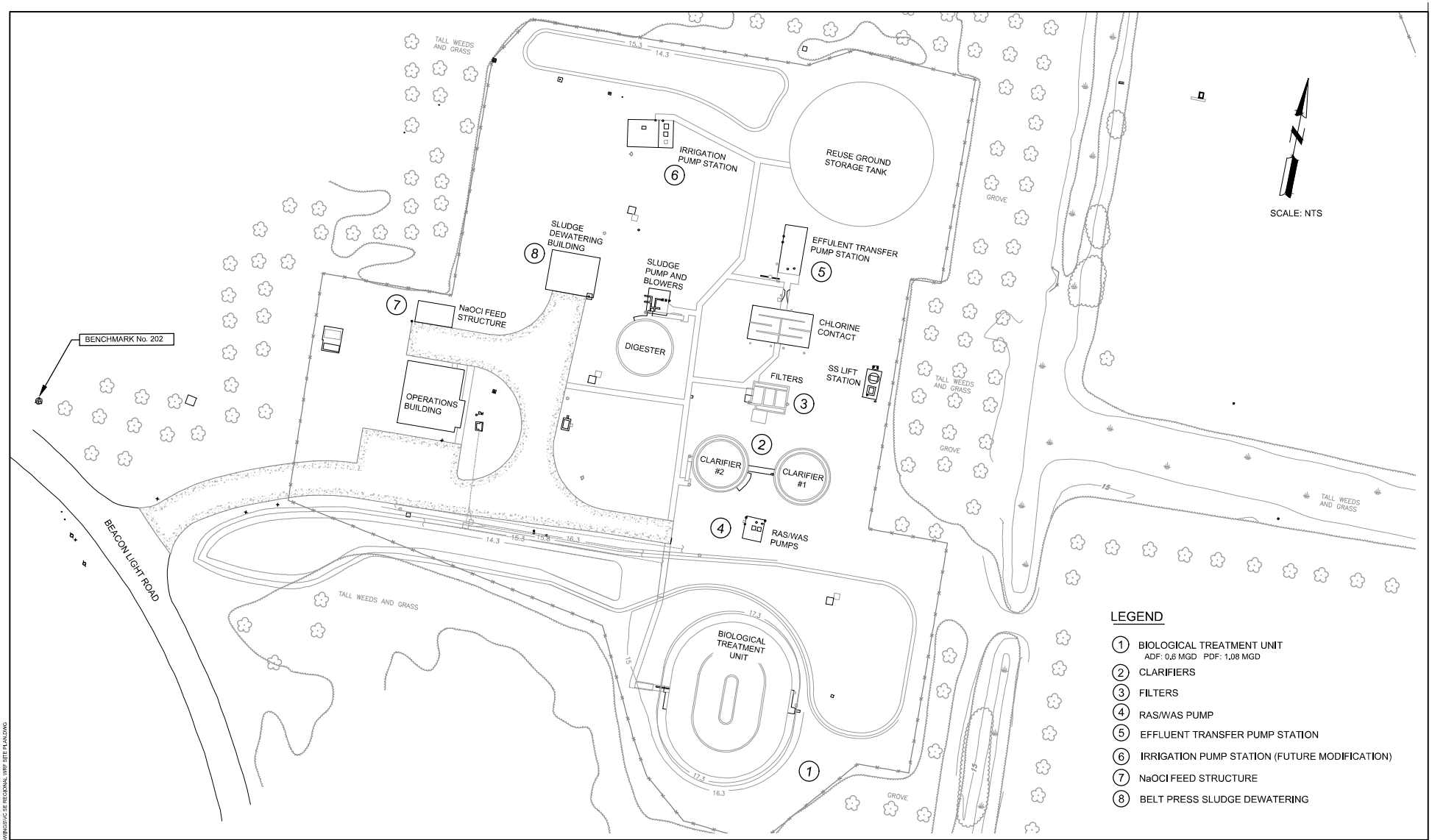

VOLUSIA COUNTY
S.E. REGIONAL W.R.F.
OPERATING PERMIT RENEWAL

CLIENT PROJECT #
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W.R.F SITE PLAN

EXHIBIT 1

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2. Existing Conditions

21 Historical Flow Conditions

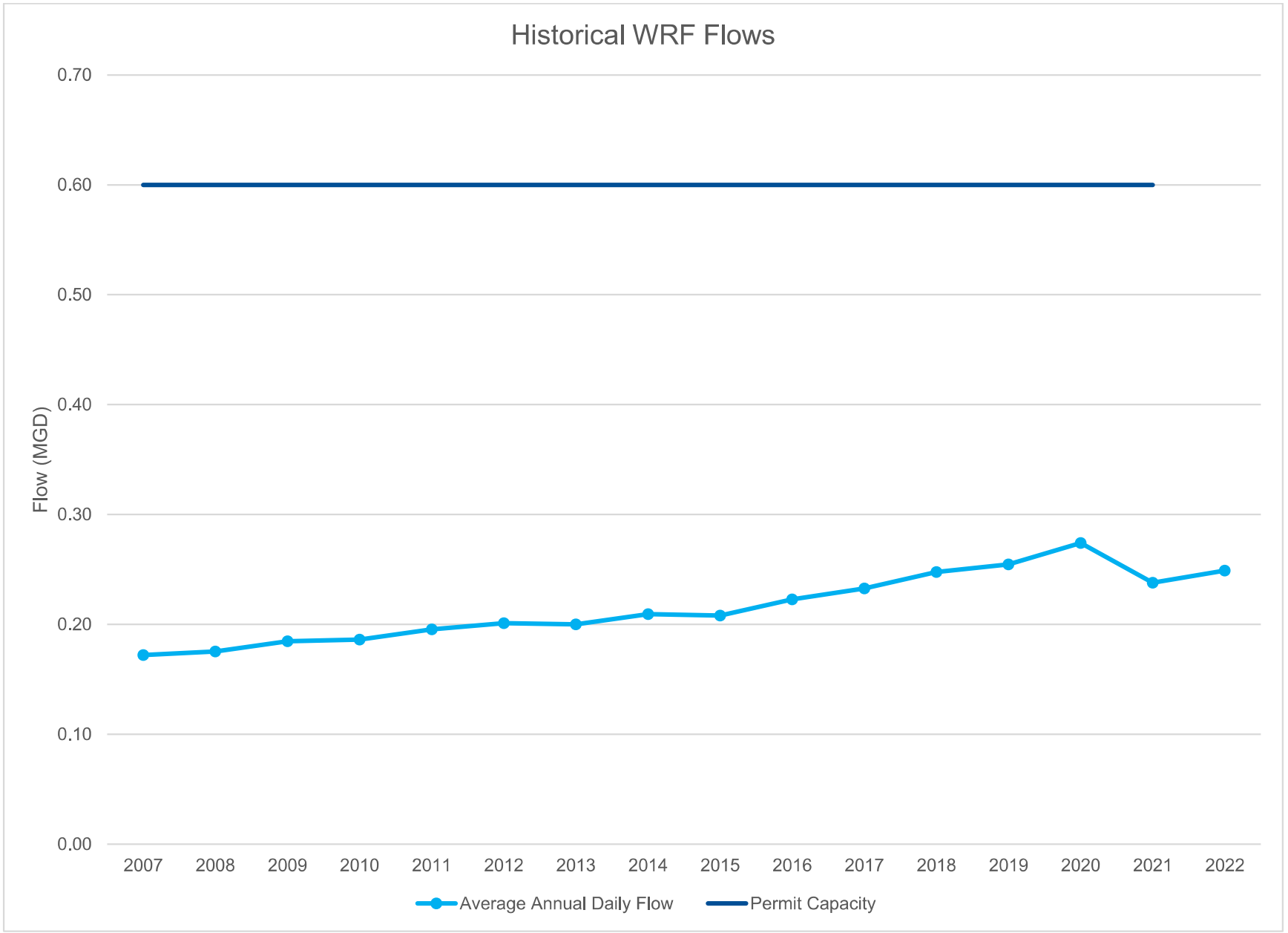
The current rated capacity of Volusia County's Southeast Regional WRF is 0.6 MGD, based on average annual daily flow conditions.

Historical flow through the WRF for 2007-2022 are provided in **Table 2-1** and the following graph.

Existing conditions indicate that average daily flow values remain below 80% of the plant's rated capacity of 0.6 MGD.

TABLE 2-1: VOLUSIA COUNTY SOUTHEAST REGIONAL WRF ANNUAL AVERAGE FLOW VALUES 2007-2023

Year	Total Flow Through Plant AADF (MGD)
2007	0.17
2008	0.18
2009	0.18
2010	0.19
2011	0.20
2012	0.20
2013	0.20
2014	0.21
2015	0.21
2016	0.22
2017	0.23
2018	0.25
2019	0.25
2020	0.27
2021	0.24
2022	0.25


Historical WRF Flows
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Flow (MGD)
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Average Annual Daily Flow
Permit Capacity

2.2 Description of Unit Processes

This section of the report details plant components and demonstrates the applicability of the permitted capacity.

2.2.1 Influent Structure

Raw sewage is pumped from the Ariel Road lift station into the Orbal basin feed trough. One manual bar screen currently removes rags and plastics from the influent stream. **FUTURE:** As part of the plant expansion a new headworks will be constructed including rotary drum screens and bypass channel.

2.2.2 Biological Treatment Unit (BTU)

Screened wastewater enters the Orbal aeration basin. The BTU consists of two concentric channels which can be hydraulically isolated from each other. The tank is a plug flow reactor designed to reduce short circuiting. The disc aerators provide both mixing and aeration. The basin is currently permitted for 0.6 MGD. **FUTURE:** A new 4-Stage Bardenpho treatment process, rated for 1.2 MGD, will be constructed as part of the plant expansion.

Existing Design:	
Basin Volume	586,000 gallons
Aeration Time	23.4 hours
Sludge Age	25 days

2.2.3 Secondary Clarifiers

Solids separation for the activated sludge process is currently provided via sedimentation in two (2), 38 ft diameter circular clarifiers. Each of the existing clarifiers has a rated capacity of 0.45 MGD (AADF). The existing clarifiers are both 38 feet diameter circular structures with a 14-foot side water depth (SWD). The surface loading rates for the two existing clarifiers are approximately 400 gpd/sf. Typical design overflow rates are between 400-500 gpd/sf. **FUTURE:** The expansion will include two (2) new 1.8 MGD clarifiers.

Return sludge and waste sludge pumping for the two original clarifiers is accomplished from a common pump station. These clarifiers are served by two (2) RAS pumps capable of pumping 425 gpm and each of these pumps can be throttled down to 75 gpm when used for WAS pumping. **FUTURE:** The two (2) new clarifiers will be served by a new pump station including four (4) new RAS pumps and two (2) new WAS pumps.

Total return sludge pumping capacity with one of the largest units out of service is 425 gpm. This capacity represents 100% return sludge rate at the permitted 0.6 MGD average daily flow conditions.

2.2.4 Upflow Sand Filters

Filtration is being provided for TSS control to meet the requirements of FDEP. Chapter 62-610 for Public Access Spray Irrigation. The basis of design is the Dynasand Upflow Type Filter. The filters meet Class I Reliability which requires a capacity of 75% of the design flow with the largest unit out of service. The filter includes 200 square feet of filter area divided into two rows of two 50 square foot modules. Design criteria for the filters are as follows:

TABLE 2-2: UPFLOW SAND FILTERS DESIGN PARAMETERS

Existing	Flow	Loading Rate		Influent TSS	Effluent TSS
	MGD	gpm	gpm/sf	mg/L	mg/L
ADF	0.6	417	2.08	30	5
MDF	1.08	750	3.75	30	5
PHF	1.5	1042	5.21	30	5

FUTURE: Two (2) new disc filters rated for 1.2 MGD each will be installed as part of the plant expansion.

2.2.5 Chlorine Contact Facilities

The chlorine contact chamber volume is 32,474 gallons, hydraulic detention time is greater than 20 minutes under peak hour flow conditions (2.5 P.F.). The basin was designed for the build out capacity of 1.2 MGD.

Q, Average (MGD)	=	1.2
Q, Peak Hour (gpm)	=	2,083
Required Chlorination Volume	=	(15 min)(2,083 gpm)
	=	31,245 gallons

2.2.6 Sludge Handling Facilities

Volusia County operates one (1) aerobic holding tank at this facility. The basin has a capacity of 120,000 gallons. A standby basin is not required. The digester has a coarse bubble diffused aeration system and two centrifugal blowers. The system is designed to deliver 30 scfm/1000 cf in accordance with the Ten State Standards. One blower serves as a standby unit to meet Class I Reliability

Sludge is stored in the aerobic digester where it is thickened to approximately 6% solids content. The digested sludge is then pumped to the on-site belt press sludge dewatering process. The dewatered sludge is then hauled to a disposal site by Shelley's Environmental Systems.

3. Future Conditions

Volusia County Utility Department (VCUD) provides wastewater services to residents in Southeast Volusia County. The Southeast WRF serves these residents. This facility currently treats approximately 250,000 gpd. Permitted capacity for the existing plant is 600,000 gpd. Additional treatment capacity is NOT required to meet projected flow throughout the duration of the requested permit.

The County of Volusia established the Southeast WRF as a regional treatment facility. This regional treatment facility has the ability to increase treatment capacity as its service area grows in population and size. The ability to increase treatment capacity allows the County to operate one large wastewater facility instead of constructing and operating several small treatment plants. The Southeast WRF site has adequate space for the future expansion.

3.1 Flow Projections

The Cities of Edgewater, Oak Hill, and the surrounding areas have not experienced the previously projected rapid population growth anticipated during previous permit renewals (which included plans to expand the treatment facility from 0.6 MGD to 1.2 MGD).

3.1.1 Residential Planned Unit Developments

There are planned developments within Oak Hill and Edgewater that will be utilizing sanitary sewer and contributing flow to the SERWRF. These developments include the Oak Hill Reserve RPUD, Garden Street RPUD, the Oakbridge Colony RPUD, Crestwood PUD, Washington Park, Hacienda Del Rio Expansion, Riverfront Estates, Tamarack Mobile Home Park, and Lighthouse Cove.

3.1.2 Indian Harbor Estates Septic Conversion

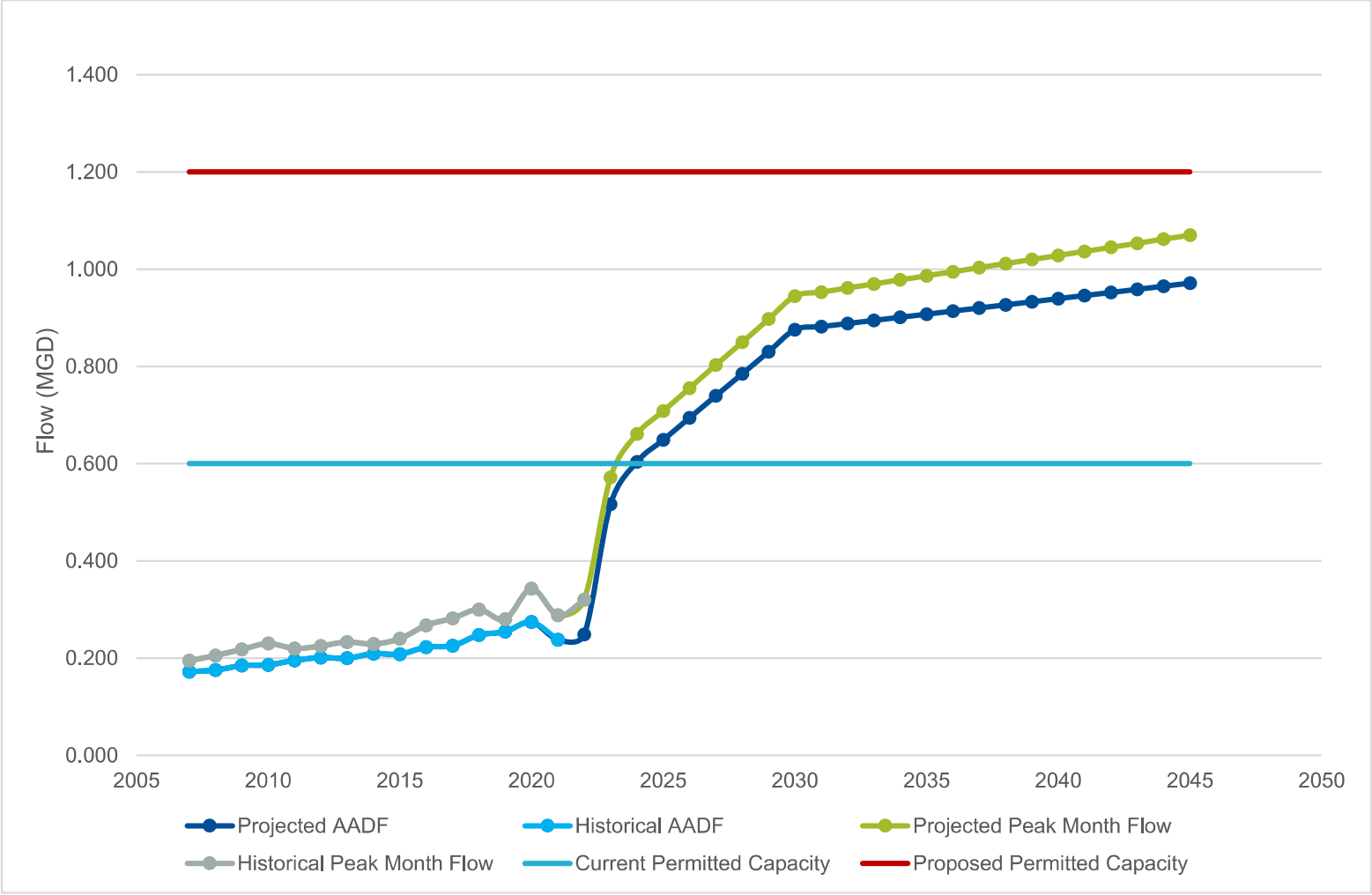
Indian Harbor Estates is a community consisting of approximately 280 single family homes. This area is currently under a septic to sewer conversion. This conversion will contribute approximately 84,000 gallons per day to the SERWRF.

Flow projections for the purpose of this Capacity Analysis Report use a historical trendline of past flow from 2007-2022 with the addition of planned developments previously mentioned. All planned developments were assumed complete by 2030, with the exception of Indian harbor Estates which will be online by the end of 2023. Flow projections have been prepared through the year 2040 with results presented in **Table 3-1** and **Figure 3-1**. The projection indicates average flows of 0.631 MGD and peak month flows of 0.720 MGD in 2040.

TABLE 3-1: INFLUENT FLOW PROJECTIONS 2007-2040

Year	Total Flow Through Plant AADF (MGD)	Yearly Change (%)	Peak Month Flow (mgd)	Peak Month Peak Factor
2007	0.172	N/A	0.195	1.13
2008	0.175	1.87%	0.205	1.17
2009	0.185	5.33%	0.218	1.18
2010	0.186	0.81%	0.230	1.24
2011	0.195	4.97%	0.220	1.13
2012	0.201	2.90%	0.225	1.12
2013	0.200	-0.58%	0.233	1.17
2014	0.209	4.67%	0.229	1.09
2015	0.208	-0.61%	0.240	1.15
2016	0.223	7.09%	0.267	1.20
2017	0.226	1.27%	0.282	1.25
2018	0.248	9.77%	0.300	1.21
2019	0.255	2.83%	0.280	1.10
2020	0.274	7.66%	0.343	1.25
2021	0.238	-13.20%	0.288	1.21
2022	0.249	4.66%	0.320	1.29
Historical Averages	**0.215**	**2.48%**	**0.250**	**1.17**
2023	0.517	51.80%	0.572	1.11
2024	0.604	16.90%	0.661	1.09
2025	0.649	7.50%	0.708	1.09
2026	0.694	6.98%	0.756	1.09
2027	0.740	6.52%	0.803	1.09
2028	0.785	6.12%	0.850	1.08
2029	0.830	5.77%	0.897	1.08
2030	0.876	5.45%	0.945	1.08
2031	0.882	0.73%	0.953	1.08
2032	0.888	0.72%	0.961	1.08
2033	0.895	0.72%	0.970	1.08
2034	0.901	0.71%	0.978	1.09
2035	0.908	0.71%	0.986	1.09
2036	0.914	0.70%	0.995	1.09
2037	0.920	0.70%	1.003	1.09
2038	0.927	0.69%	1.012	1.09
2039	0.933	0.69%	1.020	1.09
2040	0.939	0.69%	1.028	1.09

FIGURE 3-1: INFLUENT FLOW PROJECTIONS 2007-2040



4. Summary and Conclusions

Projected flow increases in the Southeast service area necessitate expansion of the Southeast regional WRF. The SERWRF is projected to reach 80% of its permitted capacity by 2025 which is within the expiration date of the requested permit.

In addition to new developments in the County's southeast service area, the SERWRF is moving towards Advanced Wastewater Treatment (AWT) standards. In order to achieve AWT, a new plant must be constructed. It is recommended that the new plant be expanded to 1.2 MGD to satisfy the projected demands while maintaining AWT standards.

5. Certifications

ENGINEER'S CERTIFICATION:

The information contained in this report is true and correct to the best of my knowledge. The report was prepared in accordance with sound engineering principles, and I discussed the recommendations and schedules with the permittee.

_____

Brad T. Blais, P.E.
QLH, A Mead & Hunt Company
4401 Eastport Parkway
Port Orange, FL 32127
Telephone: (386) 761-6810
FL Registration No. 47130

PERMITTEE'S CERTIFICATION:

We are fully aware and intend to comply with the recommendations and schedules included in this report.

_____

Michael Ulrich
Director
Volusia County Water Resources and Utilities
123 West Indiana Ave.
DeLand, FL 32720
(386) 943-7027

LEAD OPERATOR CERTIFICATION:

I am fully aware and intend to comply with the recommendations and schedules included in this report.

_____

Robert Beedle, Lead Operator
Volusia County
325 Beacon Light Rd.
Oak Hill, FL 32759
Telephone: (386) 566-9164
Certification #A-0009628

Appendix A – Basis of Design for Volusia County 0.6 MGD Advanced Wastewater Reclamation Facility

DESIGN SUMMARY

1.	Influent Flows and Loadings	
	Average Daily Flow	0.6 MGD
	Maximum Flow	1.5 MGD
	BOD_5	225 mg/l (1126 lbs/day)
	Suspended Solids	225 mg/l (1126 lbs/day)
2.	Effluent Loadings	
	BOD_5	5 mg/l (25 lbs/day)
	Suspended Solids	5 mg/l (25 lbs/day)
3.	Screening	
	Manual Bar Screen	1
	Maximum Flow	>1.5 mgd
4.	Biological Treatment Units (Orbal Process)	
	Flow @ ADF	0.6 mgd
	Volume	586,000 gallons
	Aeration Time, hours	22.4 hours
	Lbs. of Solids Produced per lbs of BOD applied	0.66 lbs
	Solid Produced per Day (D.S.)	737 lbs
	Lbs. of Oxygen Required per lb. BOD	1.29 lbs
	Lbs. of Oxygen Required per lb. Ammonia	4.6 lbs
	Lbs. of Oxygen Required per design BOD	1452 lbs
	Lbs. of Oxygen Required per design Ammonia	690 lbs
	Denitrification Credit, lbs oxygen	145 lbs
	Total Oxygen Required, lbs/day	1908 lbs
5.	Clarifiers	
	Number of Units	2
	Type	Circular Basin
	Dimensions	38' dia. x 14' SWD
	Surface Overflow Rate @ ADF	400 GPD/sf
	Weir Loading rate @ ADF	5042 GPD/lf
6.	Polishing Sand Filters	
	Number of Units	4
	Type	Dynasand Upflow Automatic Backwash

Filter Area, each unit	50 sf
Loading Rate @ ADF	2.08 gpm/ft^2
Loading Rate @ Peak Flow	5.21 gpm/ft^2

7. Chlorination Basin

Number of Units	2
Volume per Unit	16,237 gals each
Detention Time @ Peak	31 minutes

8. Effluent Storage

Number of Basins	1
Volume	2,000,000 gallons

9. Aerobic Sludge Digestion

Number of Units	1
Volume	120,000 gallons
Detention Time @ 2% Solids	25 days
Type Aeration	Coarse Bubble Diffused
Air Supplied	30 scfm/1000 ft^3

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PRELIMINARY DRAFT

Southeast Regional Water Reclamation Facility Operation and Maintenance Performance Report

February 2023

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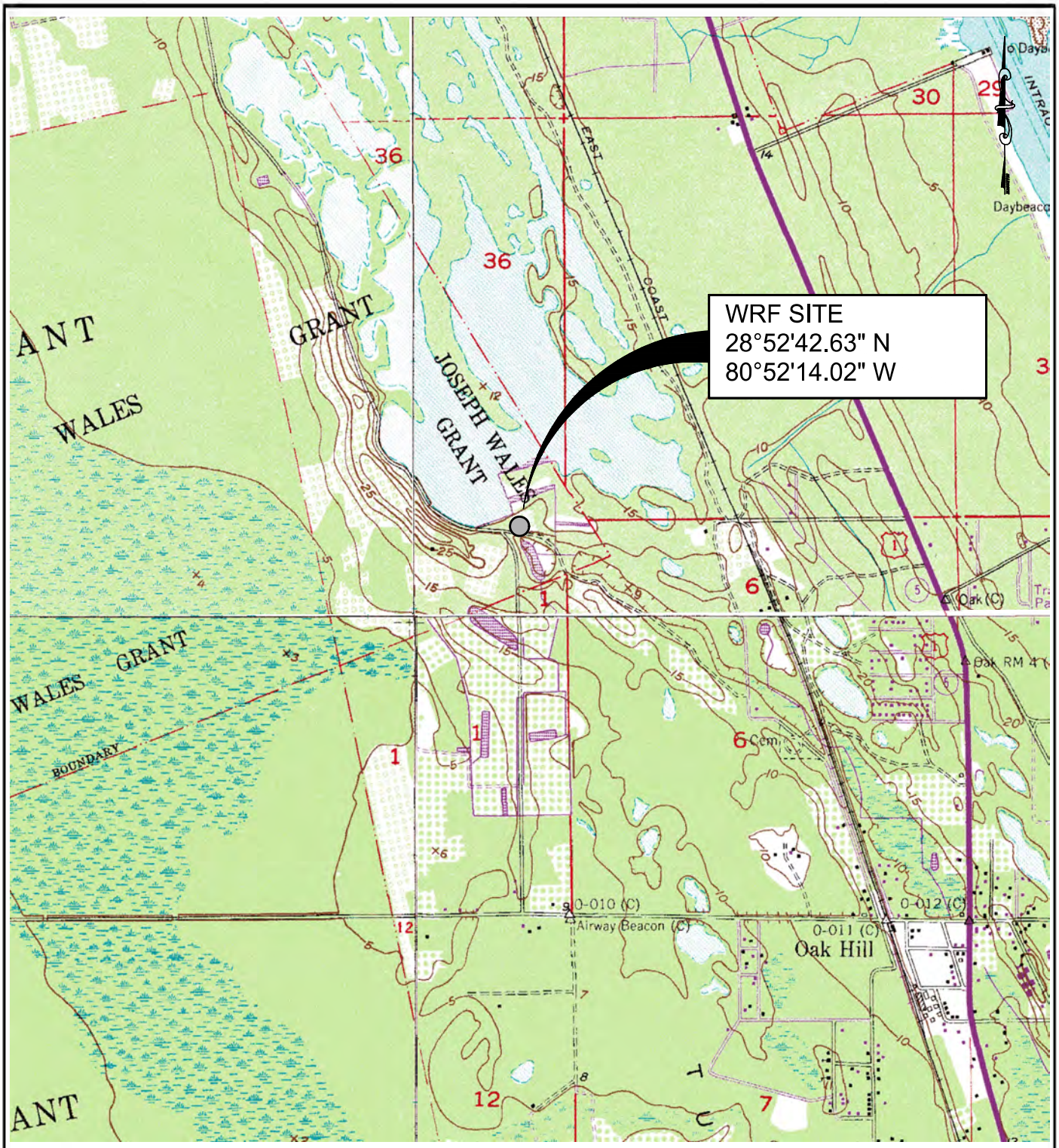
1. Facility Descriptions

The Volusia County Southeast Regional Water Reclamation Facility (SERWRF), located at 325 Beacon Light Road in Oak Hill, serves residential, commercial and light industrial areas. This facility is classified as a "secondary treatment plus filtration" facility using the activated sludge process and meets all Class I Reliability criteria. The activated sludge process is the extended aeration/oxidation ditch (Orbal Process). A location map, site plan, and process flow schematic of the Water Reclamation Facility are presented with this report.

The unit operations and processes employed at the facility are divided into the following categories:

- Preliminary Treatment – screening with a fixed bar screen located in the influent trough.
- Secondary Treatment – including aeration of the mixed liquor utilizing the extended aeration process (Orbal Oxidation Ditch Process) and final clarification.
- Tertiary Treatment – including Alum addition (as needed), Tertiary filtration and high level disinfection.
- Effluent Disposal – Irrigation of an unrestricted access citrus grove.
- Sludge Treatment – Sludge is stored and processed in the aerobic digester, then pumped to a belt press for dewatering. Sludge cake is then hauled by Shelley's Environmental Systems for disposal.

The SERWRF is currently under design to be expanded from 0.6 MGD to 1.2 MGD. Construction is scheduled to be complete by 2025.



GRAPHIC SCALE:

LOCATION MAP

SECTION 36
TOWNSHIP 19S
RANGE 34E

FROM EDGEWATER, FLA.
U S C & G QUADRANGLE

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Volusia County
SE Regional WRF
Operation Permit
Renewal

Figure 1-1 - Location Map

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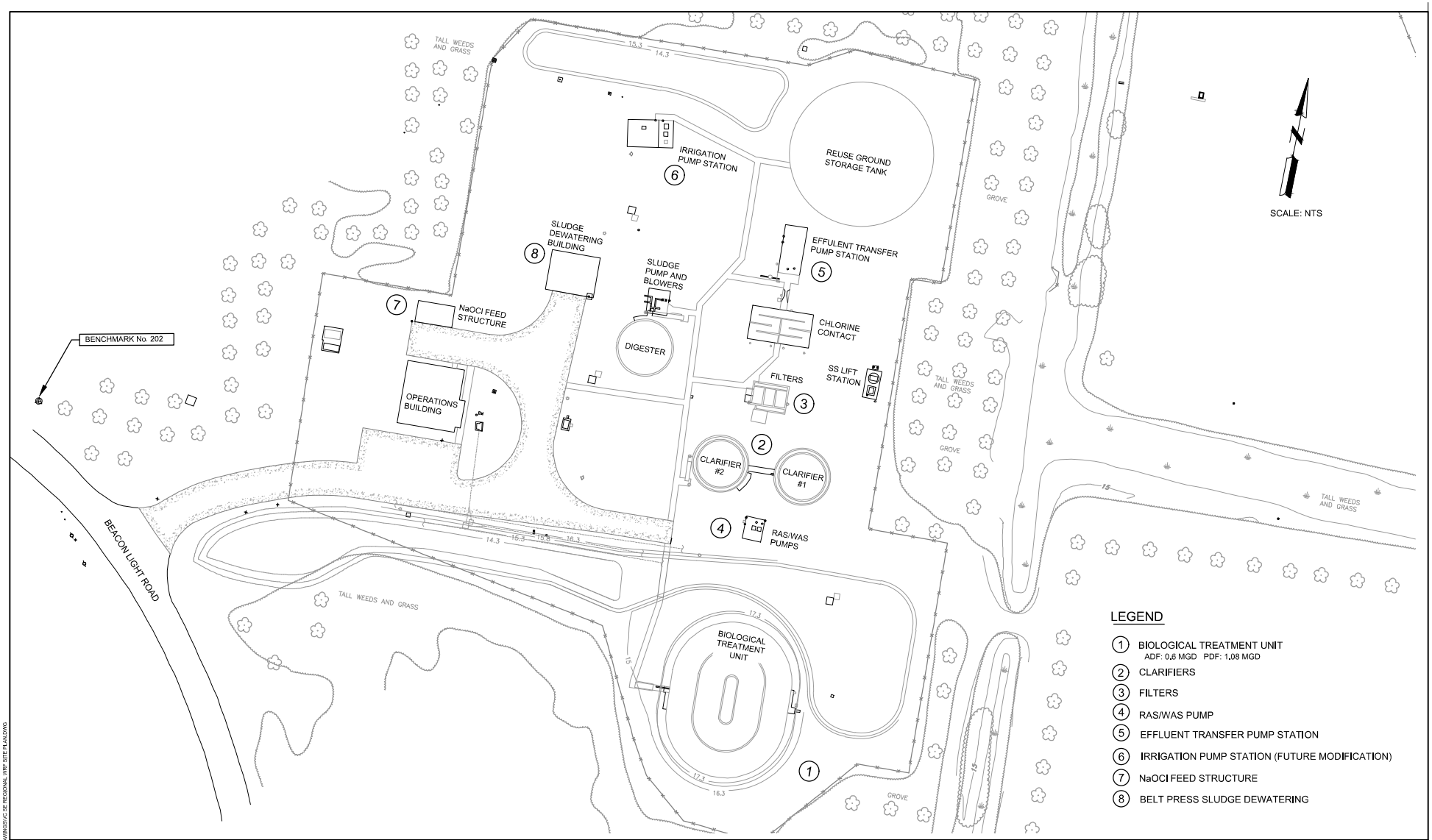

VOLUSIA COUNTY
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W.R.F SITE PLAN

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PROCESS FLOW DIAGRAM

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EXHIBIT 2

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2. Unit Processes and Technical Design Data

2.1 Hydraulic Profile, Loadings and Treatment Efficiencies

The loadings and flows utilized in establishing the hydraulic profile and the design of the unit processes were as follows:

Existing	Flow (MGD)[2]	BOD (mg/L)	TSS (mg/L)
Average Daily[3]	0.6	225	225
Maximum Daily	1.08	(1)	(1)
Peak Hourly	1.5	(1)	(1)

FUTURE	Flow (MGD)[2]	BOD (mg/L)	TSS (mg/L)
Average Daily[3]	1.2	225	225
Maximum Daily	2.16	(1)	(1)
Peak Hourly	3.0	(1)	(1)

(1) BOD and TSS loadings are not anticipated to change significantly with variations in flow.

(2) These flows include 100% recycle and future expansion to a 1.2 MGD facility. Peaking factors utilized are 1.8 for MDF and 2.5 for PHF.

(3) Average Daily Flow should approximately be equal to monthly average flows.

The design treatment efficiencies are as follows:

TABLE 2-1: EXISTING TREATMENT EFFICIENCIES

Parameter	Influent	Effluent		Design Removal Capacity	Percent Removal
	(ppm)	(mg/L)	(lbs/day)	(lbs/day)	(%)
BOD	225	5-20	25	1126	98.2-92.6
TSS	225	5	25	1126	98.2

TABLE 2-2: FUTURE TREATMENT EFFICIENCIES

Parameter	Influent	Effluent		Design Removal Capacity	Percent Removal
	(ppm)	(mg/L)	(lbs/day)	(lbs/day)	(%)
BOD	225	5-20	50	2252	98.2-92.6
TSS	225	5	50	2252	98.2

22 Biological Treatment System

The design basis of the Biological Treatment Unit (BTU) is a multiple channel oxidation ditch utilizing disc aerators. The exiting BTU consists of the two concentric channels. **FUTURE:** A new 4-Stage Bardenpho treatment process rated for 1.2 MGD will be constructed as part of the plant expansion.

The disc aerators can provide variable amounts of oxygen delivery with variation of RPM, disc immersion, or direction of disc rotation. Oxygen requirements for the system are as follows:

TABLE 2-3: EXISTING SYSTEM DESCRIPTION (CALCS @ 0.6 MGD)

EXISTING SYSTEM DESCRIPITON (Calcs @ 0.6 MGD)	
Aeration Time (hours)	22.4
lbs. Solids Production/lb. BOD applied	0.66
Solids produced per day (lbs.)	737
Sludge age (days)	25
Additional days of aerobic digestion required at design sludge age	15
lbs. Oxygen required/lbs. BOD	1.29
lbs. Oxygen required/lbs. Ammonia	4.6
Percent denitrification credit	80
lbs. Oxygen required to satisfy BOD	1452
lbs. Oxygen required to satisfy Ammonia	690
Denitrification credit (lbs.)	145
Total Oxygen required (lbs./day)	1908
Total Actual Oxygen required (lbs./hour)	74

The above figures are for 21" immersion. Following are correction factors for alternate immersion levels:

in.	20	19	18	17	16	15	14	13	12	11	10	0
C.F.	0.95	0.91	0.87	0.83	0.79	0.75	0.71	0.67	0.63	0.59	0.55	0.51

At design conditions of 17" immersion base forward and 43 RPM, the aeration discs will deliver 104.9 lbs. O_2/hr, which exceeds the required delivery rate of 74 lbs. O_2/hr by approximately 40%. With one aerator out of service, the remaining aerator can deliver 95 lbs. O_2/hr which exceeds the required delivery rate and exceeds the requirements of Class I Reliability. **FUTURE:** The future aeration capacity will be 172 lbs. O_2/hr, which exceeds the proposed delivery rate of 155 lbs. O_2/hr by approximately 10%.

For energy efficiency, aerator discs can be removed or installed as required to match the oxygen demand.

The existing outer channel is operated at an average dissolved oxygen level of 1.0 mg/L and the inner channel 2.0 mg/L.

Each channel can be individually dewatered and the system will continue to operate which provides separate aeration basins. The oxygen delivery can be significantly increased in any channels remaining in operation by the addition of discs and increasing disc speed.

The volume of the inner channel is approximately 205,000 gallons. The volume of the existing outer channel is approximately 381,000 gallons.

23 Clarifiers

The plant has two clarifiers with a capacity of 0.45 MGD each. **FUTURE:** Two (2) new clarifiers with a capacity of 1.8 MGD each will be included in the plant expansion.

TABLE 2-4: CLARIFIER DESIGN CRITERIA

	Overflow Rate gpd/sf	Solids Loading lb/day/sf	Side Water Depth ft.	Hydraulic Retention Time, hrs.	Weir Loading gpd/lf
EPA Recommended Design Criteria	400-500	30	12-14	2.5-4	10,000
Actual Design	400	17	14	6.3	5,042

Clarifier diameter is approximately 38 feet. A scraper-type clarifier is utilized. As required by the E.P.A. "Design Criteria for Mechanical, Electrical, and Fluid System Component Reliability" Class I Reliability, each clarifier has a capacity of 75% of the design flow with the largest unit out of service.

At the peak hourly flow rate of 1.5 MGD the overflow rate is 661 gpd/sf and the solids loading rate is 1.2 lb/day/sf. Each item is within the design capacity for Class 1 Reliability.

24 Filtration

Filtration is being provided for TSS control to meet the requirements of F.D.E.P. Chapter 62-610 for Public Access Spray Irrigation. The basis of design is the Dynasand Upflow Type Filter. The filters meet Class I Reliability which requires a capacity of 75% of the design flow with the largest unit out of service. The filter includes 200 square feet of filter area divided into two rows of two 50 square foot modules. Design criteria for the filters are as follows:

TABLE 2-5: EXISTING FILTER DESIGN CRITERIA

Existing	Flow	Loading Rate		Influent TSS	Effluent TSS
	MGD	gpm	gpm/sf	mg/L	mg/L
ADF	0.6	417	2.08	30	5
MDF	1.08	750	3.75	30	5
PHF	1.5	1042	5.21	30	5

FUTURE: Two (2) new disc filters rated for 1.2 MGD each.

In accordance with FDEP Chapter 62-610 chemical feed facilities have been provided and chemical addition will be made if required to meet TSS limits. A 150-gallon fiberglass tank for mixing and storage of aluminum sulfate solution or polymer is provided. The system has two diaphragm metering pumps with one serving as backup. The system is manually controlled. Under normal operating conditions, no chemical feed is needed. Feed equipment can deliver 0.60 mg/L with the normal anticipated dosage being 1 mg/L when required. An application point is in the influent line located prior to the filters.

25 Chlorination

Effluent disposal by public access irrigation requires high level disinfection. Based on FDEP Chapter 62-600, high level disinfection requires a minimum chlorine residual of at least 1 mg/L at all times and a minimum contact time of 15 minutes at peak hourly flow.

In addition, Class I Reliability requires that with the largest flow capacity unit out of service the remaining units will have a design flow of at least 50% of the total design flow to that unit operation.

In order to meet these requirements, a concrete baffled chlorine contact chamber (CCC) is provided. The CCC is divided into two equal basins to meet Class I Reliability. The CCC is sized for the future design capacity of 1.2 MGD. The volume of the entire basin is approximately 32,474 gallons. The chlorine system is a liquid hypochlorite disinfection system.

26 Waste Activated Sludge and Return Activated Sludge

The design return sludge rate is 100% of the average daily flow rate. The return sludge pumps also serve as the waste activated sludge pumps. Based on a 0.6 MGD ADF or 417 gpm, the installation includes two (2) 425 gpm pumps. One pump serves as standby to meet Class I Reliability. The pumps are variable speed centrifugal screw pumps with a capacity range of 75-425 gpm to allow variations in wasting and return rates. The return sludge flow is stopped during sludge wasting. **FUTURE:** The plant expansion will include a new RAS/WAS pump station to go with the two (2) new clarifiers. With an AADF of 1.2 MGD, the RAS pumps will be sized to provide Class I Reliability of 100% of the AADF.

27 Aerobic Sludge Thickening

The biological treatment process results in long sludge retention times. The design sludge age is 25 days in the biological process. The design volume of the digester is 120,000 gallons. A standby basin is not required. The digester has a coarse bubble diffused aeration system and two centrifugal blowers. The system is designed to deliver 30 scfm/1000cf in accordance with Ten State Standards. One blower serves as a standby unit to meet Class I Reliability.

28 Sludge Thickening and Handling

Sludge is stored in the aerobic digester and then pumped to the belt press which discharges dewatered cake which is then hauled by Shelley's Environmental Systems. In emergency situations, sludge can be hauled to the County's Southwest Regional WRF (in Debary, FL) for dewatering.

29 Flow Metering, Monitoring and Control

The following meters are provided:

Location	Type	Flow Range
Influent	Magnetic meter	0-1500 gpm
Effluent	Ultrasonic	0-750 gpm
Return Sludge	Magnetic meter	0-450 gpm

Monitoring points are easily accessible at the influent and effluent to the plant. Walkways are provided at the Chlorine Contact Chamber and the Biological Treatment Unit. In addition to flow metering, continuous

on-line monitoring for turbidity and total chlorine residual is provided. Chlorine is monitored at the discharge of the Chlorine Contact Chamber. Turbidity is monitored prior to application of the disinfectant at the filter discharge.

2.10 Transfer Pumps

The transfer pump station includes two pumps. Each pump has a capacity of 750gpm. The combined capacity of the pumps is 1500 gpm or 2.16 MGD. At current treatment capacity, the design maximum daily flow is 1.08 MGD. The pumps are capable of delivering the maximum daily flow with one pump out of service. **FUTURE:** An additional 750 gpm pump would be added allowing for 2250 gpm or 3.24 MGD so that the maximum daily flow could still be pumped with one pump out of service.

Acceptable quality reclaimed water is pumped to a 2.0 million gallon ground storage tank. Electrically operated butterfly valves automatically divert unacceptable quality reclaimed water (i.e. Turbidity >2 NTU or Chlorine Residual <1 mg/L) to the lined reject pond where it is temporarily held and sent back to the head of the plant for retreatment.

2.11 Effluent Pumps

Effluent disposal/reuse is accomplished by application to the adjacent orange groves. The effluent pump station includes two pumps. Each pump has a capacity of 810 gpm. The combined capacity of the pumps is 1620 gpm or 2.33 MGD. The design average daily flow is 0.6 MGD and the hydraulic capacity of the distribution system is in excess of 0.9 MGD. The pumps are capable of delivering the average daily flow with one pump out of service. **FUTURE:** The expansion would include adding a third disposal pump, bringing the proposed total effluent pumping capacity to 2430 gpm or 3.5 MGD.

3. Facility Evaluation

The following section is an evaluation and analysis of each treatment component of the Southeast Regional Water Reclamation Facility, based on a facility inspection performed on January 25, 2023, by the Professional Engineer and Plant Operator.

3.1 Influent Flow Meter

An influent magnetic flow meter located before the BTU monitors the plant influent flow. The flow meter measures the instantaneous flow rate and the total flow. The flow meter is calibrated yearly and is in **good** condition. There is no influent pump station as all inflow is from a pressurized collection system with multiple lift stations.

3.2 Manual Bar Screen

A bar screen with one inch openings, located in the influent trough of the biological treatment unit, screens the influent flow. The bar screen must be cleaned manually, typically twice per day. The influent trough has a bypass weir if the screen gets excessively clogged. The bar screen functions **satisfactorily** and is in **good** condition.

3.3 Biological Treatment Unit

The Biological Treatment Unit (BTU) consists of a two-channel cast in place concrete oxidation ditch with disc aerators. The dissolved oxygen can be varied and maintained at different levels in each ditch, which allows the operators flexibility in achieving the desired treatment levels. Dissolved oxygen meters and probes have been installed since the last permit cycle. The south gearbox has been recently replaced with the north gearbox scheduled for replacement. The BTU is in **good** working condition, with all mechanical equipment and disc aerators functioning as designed.

3.4 Secondary Clarifiers

Two (2) 38 ft diameter cast in place concrete clarifiers are used to continuously remove settleable solids from the wastewater effluent. At current flow rates, only one clarifier is operating at a time, which allows regular cleaning of each clarifier when not in use. The clarifiers are rotated every 6 months. The clarifiers are in **proper working condition**, are **functioning** as designed, and are providing **reliable** uninterrupted service. One (1) clarifier drive motor was recently replaced and is in **good** condition while the other clarifier drive is in **fair** condition.

3.5 Alum Feed System

An alum feed system is provided to aid in coagulation and flocculation of colloids prior to filtration. The facilities consist of chemical metering pumps and an alum storage drum. Alum addition **has not been needed** on a regular basis. However, the alum feed system is activated on a regular basis to ensure that it is functioning properly. The alum feed system is in **good** working order.

3.6 Tertiary Filtration System

Dynasand Upflow Filters are used for removal of fine suspended materials from the secondary effluent. The filters function as gravity type rapid filters with continuous cleaning of the filter bed. The filtration tanks are constructed of cast in place concrete. The tertiary filtration system is in **good** working condition and is functioning as designed. The twin engine blower(s) for the upflow filter is in **excellent** condition as it was just rebuilt. The turbidity meter on the filter discharge (EFB-1) is in **good** condition.

3.7 Disinfection

The disinfection system consists of a liquid hypochlorite delivery system and a dual compartment, internally baffled, cast in place concrete chlorine contact chamber (CCC). High level disinfection of the tertiary effluent is achieved by providing a minimum of 1.0 mg/L chlorine residuals at the effluent weirs of the CCC. One CCC is required to supply contact time for disinfection, while the second chamber is rotated in on a 10-day basis. Two hypochlorite tanks with secondary containment are housed under shelter on-site. The east hypochlorite tank was out of service at the time of the site visit and is currently in the process of being replaced. The chlorine solution is added in the CCC, with a secondary disinfection point between the weir and baffle in the clarifiers. The chlorine system and CCC are in **good** working condition. A chlorine residual meter continuously monitors the chlorine residual of the plant flow downstream of the chlorine contact chamber. An alarm is activated and the plant effluent is diverted to the lined reject storage pond if the chlorine residual drops below 1 mg/L. The chlorine residual meter is **adequately** maintained and is routinely checked for accuracy.

3.8 Transfer Pumps

Highly disinfected effluent from the Chlorine Contact Chamber is conveyed to the transfer pump station. The transfer pump station pumps reclaimed water meeting "Public Access Criteria" to the reclaimed water storage tank for future transmission to the reclaimed water distribution system.

If reclaimed water does not meet the public access criteria (chlorine residual and turbidity limitations), or if a high level float indicates the reclaimed water storage tank is full, the reclaimed water is pumped to the reject pond where it is stored until returned to the head of the plant. The transfer pump station consists of a concrete structure with two existing vertical turbine pumps and space for installation of a third vertical turbine pump. The existing concrete structure, pumps and controls are in **good** condition and **functioning properly**. The control panel is in **fair** condition.

3.9 Reclaimed Water Storage Tank

The storage tank is constructed of prestressed concrete, has **no active leaks**, and appears to be in **acceptable** condition. There are some minor cracks, including an area where there was once a minor, but visible leak which sealed itself from additives in the concrete mix.

3.10 Reclaimed Water Distribution Pumping Station

The reclaimed water distribution pump station consists of two vertical turbine steel can pumps. The "canned" vertical turbine pumps and equipment appear to be in **good** condition and are providing uninterrupted, reliable service.

3.11 Reclaimed Water Distribution/Irrigation System

The reclaimed water is wholly used for irrigation of an adjacent citrus grove which is owned by the County. The total irrigable area is 94 acres. This area can be irrigated at a rate of up to 2.00 inches per week, for a disposal capacity in excess of 0.60 MGD.

The distribution system supplies reclaimed water to individual mist heads located at the base of each tree, interconnected by polyethylene tubing. To help prevent clogging of the mist heads, a cartridge filter is installed just downstream of the distribution pump station. The irrigation system and control equipment are **functioning well**.

3.12 Solid Handling Facilities

The solids handling facilities consists of two return activated sludge (RAS) pumps, an aerobic digester with air blowers, a sludge transfer pump and scum pumps, and a belt press for sludge dewatering.

The RAS/WAS pumps can either return solids from the clarifiers to the BTU or waste the solids to the aerobic digester. The RAS/WAS pumps are variable speed centrifugal solids handling pumps.

The aerobic digester is a 30 ft diameter, cast in place concrete tank, with up to 13' 6" of side water depth. Two Roots type blowers are located adjacent to the digester to provide aeration. Only one blower is needed at any time to provide adequate aeration, with the second blower provided for back up. A telescoping valve permits the operator to decant digester supernatant to the plant drainage pump station, which pumps it back to the head of the plant.

A centrifugal sludge transfer pump conveys digester sludge to a belt press for dewatering. The belt press is in **poor** condition (shown below) and is recommended for replacement. Dewatered sludge is collected in a roll-away container and hauled by Shelley's Environmental Systems. In emergency situations, sludge can go to the Southwest Regional WRF.

Both RAS/WAS pumps are in **good** condition. The digester tank, blowers, air diffusers, telescoping valve and related equipment are all in **good** working condition. The sludge transfer pump and belt press dewatering process are in **good** working order. The belt press was obtained used from another County facility.

3.13 Plant Drainage Pump Station

A plant drainage pump station conveys plant sanitary waste, tertiary filter backwash, digester supernatant and tank drainage back to the biological treatment unit. The plant drainage pump discharge enters the biological treatment unit downstream of the influent flow meter and the influent composite sampling point. The pump station equipment is in **good** condition and working properly.

3.14 Safety Features

A portable air blower, explosion and oxygen meters are not maintained at the plant. However, the County does keep these safety items at another facility for countywide use. They can be transported to the Southeast plant, or any other plant, when needed. Life preservers and throw lines are stored on-site, however this equipment is not currently provided on or adjacent to all basins and openings.

3.15 Sampling, Analysis and Reporting

Wastewater flow, chlorine residual, effluent BOD, TSS, pH, and effluent fecal coliform are monitored in accordance with the existing operating permit and are reported on the Discharge Monitoring Reports (DMR's) submitted to FDEP. Recent DMR data is presented in **Table 4-1**, later in this report.

3.16 Overall Condition

Operationally, all components at the facility are functioning according to design, with the exception of the belt press, and are expected to continue operating properly throughout the permit period with the maintenance regime in place. In addition, the water reclamation facility's unit operations and processes largely have reasonable safety features and appear to be operated safely in accordance with standard practices and/or manufacturers' recommendations.

The water reclamation facility unit operations/processes and electrical systems have been designed in accordance with E.P.A. Class I Reliability criteria and will remain operationally efficient during power outages and during periods when the largest unit, pump or piece of equipment is out of service

3.17 Operation and Maintenance Manual and Log

An up-to-date operation and maintenance log is maintained at the plant that includes all of the information required by Chapter 61E12-41, FAC. An Operation and Maintenance Manual is kept at the facility in accordance with FDEP regulations.

4. Performance Trends

Figures 4-1 through 4-6 present graphically the performance trends exhibited by all data on the monthly Discharge Monitoring Reports (DMR) from January 2020 through December 2022. The numerical data for these charts is presented in Table 4-1 of this report.

- Figure 4-1 – Flow Data
- Figure 4-2 – BOD, Chlorine, and Fecal at EFA-1
- Figure 4-3 – Nutrients at EFA-1
- Figure 4-4 – pH
- Figure 4-5 – TSS at EFB-1
- Figure 4-6 – Influent BOD and TSS

- Table 4-1 – Historical DMR Data 2020-2022

FIGURE 4-1: FLOW DATA

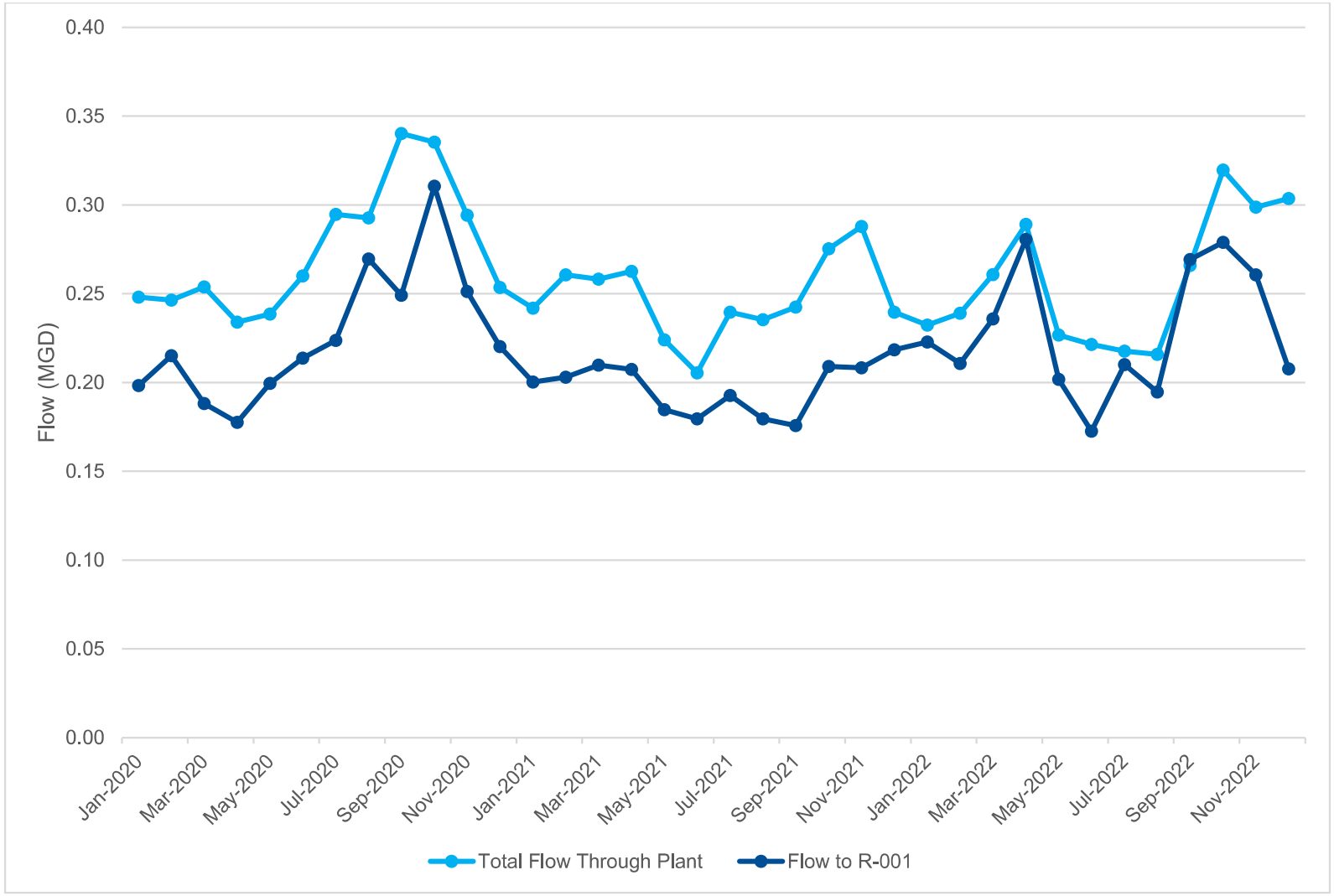

FIGURE 4-2: BOD, CHLORINE, AND FECAL AT EFA-1

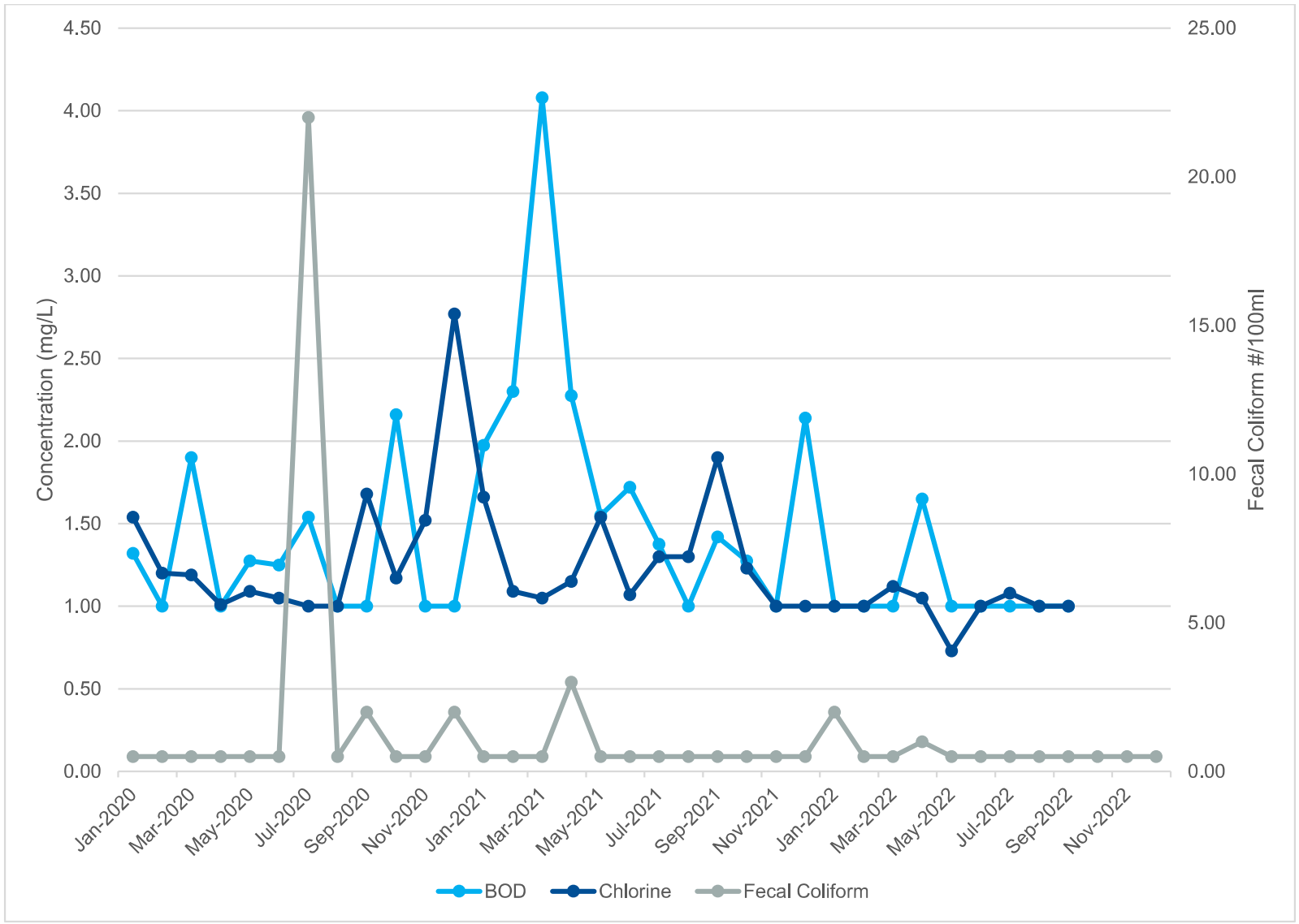

FIGURE 4-3: NUTRIENTS EFA-1

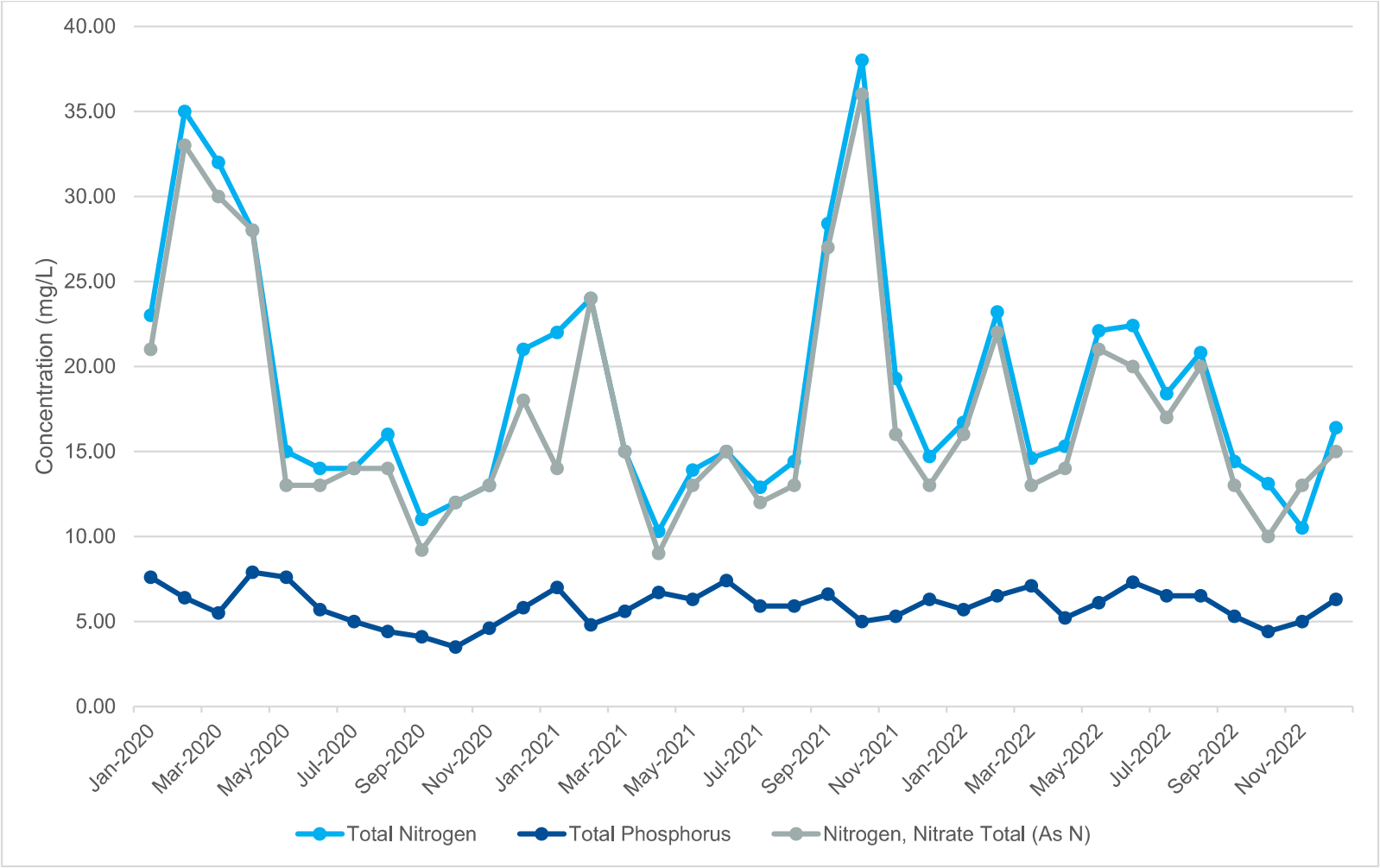

FIGURE 4-4: PH AT EFA-1

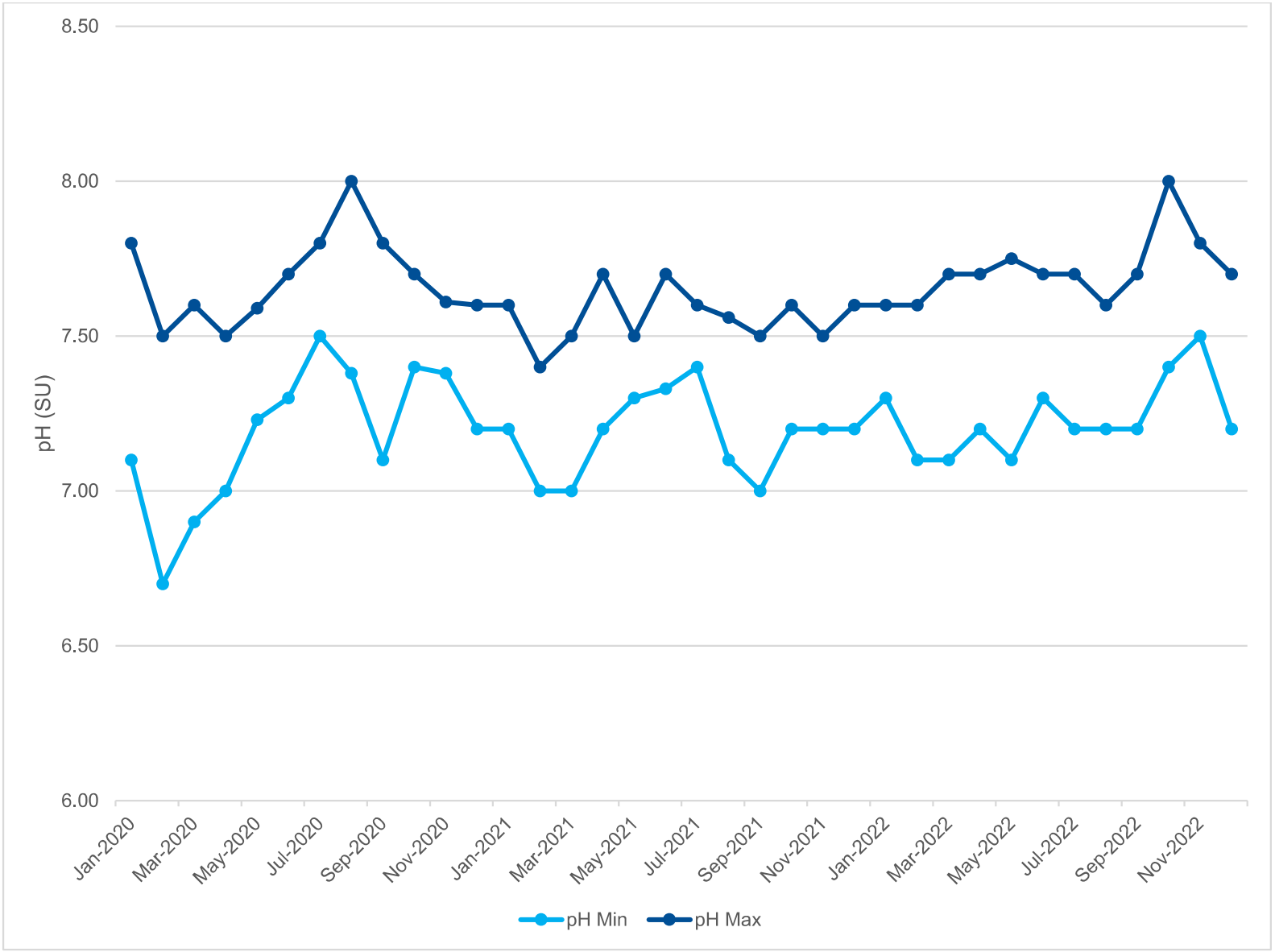

FIGURE 4-5: TSS AND TURBIDITY

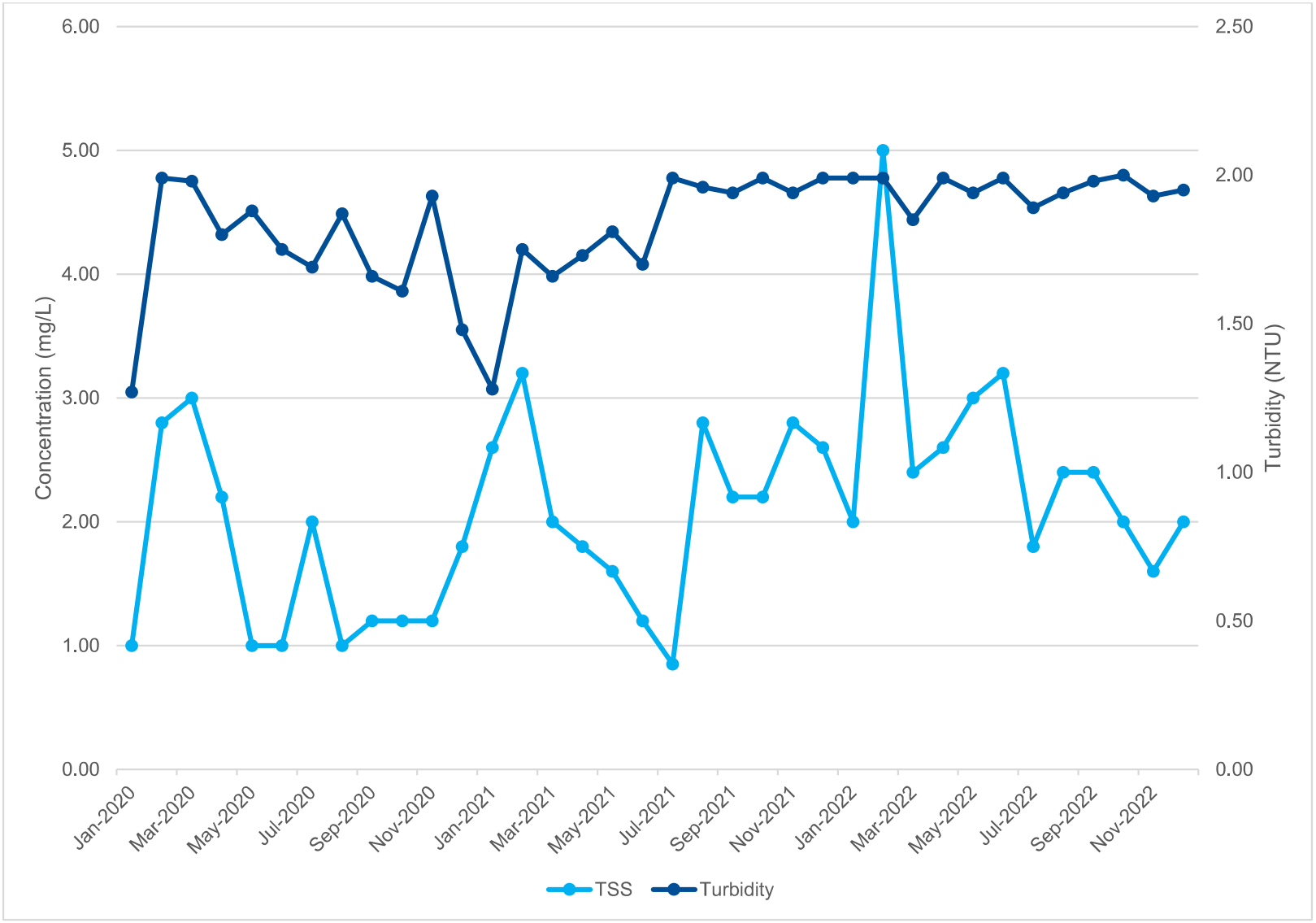

FIGURE 4-6: INFLUENT BOD AND TSS

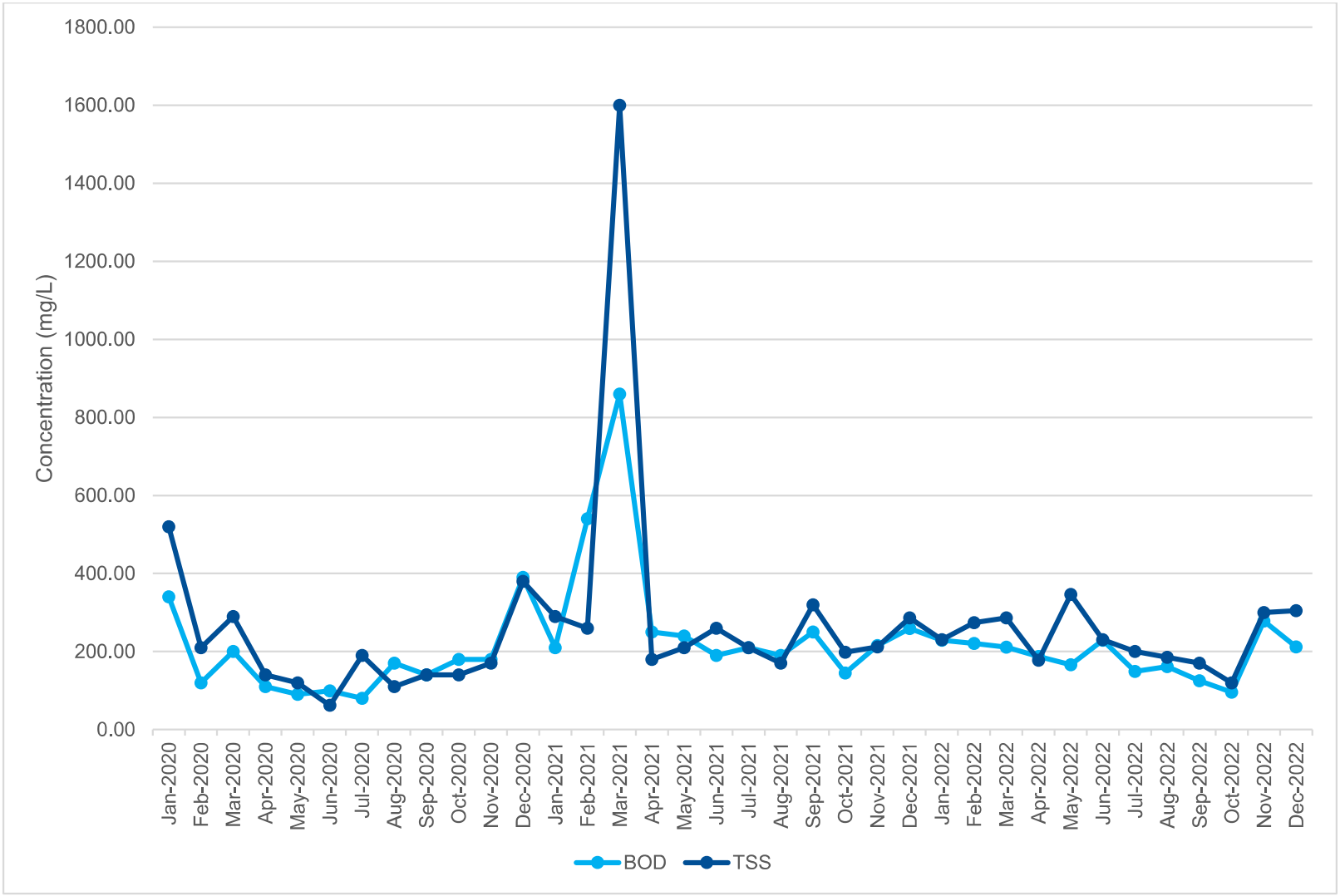

TABLE 4-1: HISTORICAL DMR DATA 2020-2022

	BOD Carbonaceous 5 day, 20C mg/L	Chlorine, Total Residual (For Disinfection) mg/L	Coliform, Fecal, % less than detection	Coliform, Fecal #/100mL	Nitrogen, Nitrate, Total (As N) mg/L	Nitrogen, Total mg/L	Phosphorous, Total (as P) mg/L	pH (Min.) s.u.	pH (Max.) s.u.	Solids, Total Suspended mg/L	Turbidity NTU	Flow (Flow thru plant) MGD	Flow (Flow to R-001) MGD	BOD Carbonaceous 5 day, 20C mg/L	Solids, Total Suspended mg/L	Percent Capacity, (TMADF/Permitted Capacity) x 100
	80082	50060	51005	74055	620	600	665	400	400	530	70	50050	50050	400	530	180
	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFB-1	EFB-1	FLW-1	FLW-2	INF-1	INF-1	FLW-1
Limits	20/30/60	≥1	75	25	Report	Report	Report	6	8.5	5	Report	0.6	0.6	Report	Report	Report
Type	16-hr FPC	Meter	Calculated	Grab	16-hr FPC	16-hr FPC	16-hr FPC	Meter	Meter	Grab	Meter	Totalizer	Totalizer	16-hr. FPC	16-hr FPC	Calculated
Frequency	Weekly	Continous	4 days/week	4 days/week	Weekly	Monthly	Monthly	5 days/week	5 days/week	4 days/week	Continuous	5 days/week	5 days/week	Weekly	Weekly	Monthly
	Monthly Average (≤30)	Single Sample Min (≥1)	Single Sample Min. (≥75)	Single Sample Max(≤25)	Single Sample Max. (≤12)	Single Sample Max.	Single Sample Max.	Single Sample (≥6)	Single Sample (≤8.5)	Single Sample Max (≤5)	Single Sample Max.	Monthly Average	Monthly Average	Single Sample Max.	Single Sample Max.	Monthly Average
Jan-2020	1.32	1.54	88.00	0.50	21.00	23.00	7.60	7.10	7.80	1.00	1.27	0.25	0.20	340.00	520.00	41.36%
Feb-2020	1.00	1.20	100.00	0.50	33.00	35.00	6.40	6.70	7.50	2.80	1.99	0.25	0.22	120.00	210.00	41.08%
Mar-2020	1.90	1.19	100.00	0.50	30.00	32.00	5.50	6.90	7.60	3.00	1.98	0.25	0.19	200.00	290.00	42.29%
Apr-2020	1.00	1.01	100.00	0.50	28.00	28.00	7.90	7.00	7.50	2.20	1.80	0.23	0.18	110.00	140.00	38.99%
May-2020	1.28	1.09	100.00	0.50	13.00	15.00	7.60	7.23	7.59	1.00	1.88	0.24	0.20	90.00	120.00	39.75%
Jun-2020	1.25	1.05	100.00	0.50	13.00	14.00	5.70	7.30	7.70	1.00	1.75	0.26	0.21	99.00	62.00	43.35%
Jul-2020	1.54	1.00	100.00	22.00	14.00	14.00	5.00	7.50	7.80	2.00	1.69	0.29	0.22	80.00	190.00	49.12%
Aug-2020	1.00	1.00	94.00	0.50	14.00	16.00	4.40	7.38	8.00	1.00	1.87	0.29	0.27	170.00	110.00	48.77%
Sep-2020	1.00	1.68	100.00	2.00	9.20	11.00	4.10	7.10	7.80	1.20	1.66	0.34	0.25	140.00	140.00	56.70%
Oct-2020	2.16	1.17	100.00	0.50	12.00	12.00	3.50	7.40	7.70	1.20	1.61	0.34	0.31	180.00	140.00	55.89%
Nov-2020	1.00	1.52	100.00	0.50	13.00	13.00	4.60	7.38	7.61	1.20	1.93	0.29	0.25	180.00	170.00	49.04%
Dec-2020	1.00	2.77	100.00	2.00	18.00	21.00	5.80	7.20	7.60	1.80	1.48	0.25	0.22	390.00	380.00	42.25%
Jan-2021	1.98	1.66	100.00	0.50	14.00	22.00	7.00	7.20	7.60	2.60	1.28	0.24	0.20	210.00	290.00	40.32%
Feb-2021	2.30	1.09	94.00	0.50	24.00	24.00	4.80	7.00	7.40	3.20	1.75	0.26	0.20	540.00	260.00	43.45%
Mar-2021	4.08	1.05	95.00	0.50	15.00	15.00	5.60	7.00	7.50	2.00	1.66	0.26	0.21	860.00	1600.00	43.02%
Apr-2021	2.28	1.15	100.00	3.00	9.00	10.30	6.70	7.20	7.70	1.80	1.73	0.26	0.21	250.00	180.00	43.76%
May-2021	1.55	1.54	100.00	0.50	13.00	13.90	6.30	7.30	7.50	1.60	1.81	0.22	0.18	240.00	210.00	37.34%
Jun-2021	1.72	1.07	100.00	0.50	15.00	15.00	7.40	7.33	7.70	1.20	1.70	0.21	0.18	190.00	260.00	34.23%
Jul-2021	1.38	1.30	100.00	0.50	12.00	12.90	5.90	7.40	7.60	0.85	1.99	0.24	0.19	210.00	210.00	39.92%
Aug-2021	1.00	1.30	100.00	0.50	13.00	14.40	5.90	7.10	7.56	2.80	1.96	0.24	0.18	190.00	170.00	39.24%
Sep-2021	1.42	1.90	100.00	0.50	27.00	28.40	6.60	7.00	7.50	2.20	1.94	0.24	0.18	250.00	320.00	40.43%
Oct-2021	1.28	1.23	100.00	0.50	36.00	38.00	5.00	7.20	7.60	2.20	1.99	0.28	0.21	145.00	198.00	45.89%
Nov-2021	1.00	1.00	100.00	0.50	16.00	19.30	5.30	7.20	7.50	2.80	1.94	0.29	0.21	215.00	212.00	47.98%
Dec-2021	2.14	1.00	100.00	0.50	13.00	14.70	6.30	7.20	7.60	2.60	1.99	0.24	0.22	259.00	286.00	39.93%
Jan-2022	1.00	1.00	89.00	2.00	16.00	16.70	5.70	7.30	7.60	2.00	1.99	0.23	0.22	229.00	230.00	38.73%
Feb-2022	1.00	1.00	94.00	0.50	22.00	23.20	6.50	7.10	7.60	5.00	1.99	0.24	0.21	221.00	274.00	39.82%
Mar-2022	1.00	1.12	100.00	0.50	13.00	14.60	7.10	7.10	7.70	2.40	1.85	0.26	0.24	211.00	286.00	43.47%
Apr-2022	1.65	1.05	100.00	1.00	14.00	15.30	5.20	7.20	7.70	2.60	1.99	0.29	0.28	187.00	178.00	48.18%
May-2022	1.00	0.73	94.00	0.50	21.00	22.10	6.10	7.10	7.75	3.00	1.94	0.23	0.20	166.00	346.67	37.79%
Jun-2022	1.00	1.00	89.00	0.50	20.00	22.40	7.30	7.30	7.70	3.20	1.99	0.22	0.17	229.00	230.00	36.92%
Jul-2022	1.00	1.08	100.00	0.50	17.00	18.40	6.50	7.20	7.70	1.80	1.89	0.22	0.21	149.00	200.00	36.27%
Aug-2022	1.00	1.00	100.00	0.50	20.00	20.80	6.50	7.20	7.60	2.40	1.94	0.22	0.19	161.00	185.00	35.98%
Sep-2022	1.00	1.00	100.00	0.50	13.00	14.40	5.30	7.20	7.70	2.40	1.98	0.27	0.27	125.00	170.00	44.32%
Oct-2022	1.00	1.02	100.00	0.50	10.00	13.10	4.40	7.40	8.00	2.00	2.00	0.32	0.28	96.00	120.00	53.26%
Nov-2022	1.64	1.00	100.00	0.50	13.00	10.50	5.00	7.50	7.80	1.60	1.93	0.30	0.26	278.00	300.00	49.80%
Dec-2022	1.00	1.28	100.00	0.50	15.00	16.40	6.30	7.20	7.70	2.00	1.95	0.30	0.21	212.00	305.00	50.60%

5. Certifications

ENGINEER'S CERTIFICATION:

The information contained in this report is true and correct to the best of my knowledge. The report was prepared in accordance with sound engineering principles, and I discussed the recommendations and schedules with the permittee.

_____

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PERMITTEE'S CERTIFICATION:

We are fully aware and intend to comply with the recommendations and schedules included in this report.

_____

Michael Ulrich
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Volusia County Water Resources and Utilities
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(386) 943-7027

LEAD OPERATOR CERTIFICATION:

I am fully aware and intend to comply with the recommendations and schedules included in this report.

_____

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Certification #A-0009628

Appendix C

Shapefiles

(electronically submitted on 2/1/2024)

Appendix D

Gemini Springs Feasibility Analysis Report

JonesEdmunds

Volusia County
FLORIDA

VOLUSIA COUNTY – GEMINI SPRINGS WASTEWATER TREATMENT FEASIBILITY ANALYSIS REPORT

Volusia County | November 2021

VOLUSIA COUNTY – GEMINI SPRINGS
WASTEWATER TREATMENT
FEASIBILITY ANALYSIS REPORT

Prepared for

Volusia County Water Resources & Utilities

123 West Indiana Avenue

DeLand, Florida 32720

Prepared by

Jones Edmunds & Associates, Inc.

730 NE Waldo Road

Gainesville, Florida 32641

Certificate of Engineering Authorization #1841

Jones Edmunds Project No.: 22015-019-01

November 2021

Brian Jeffrey Icerman, Professional Engineer, State of Florida, License No. 77080

This item has been digitally signed and sealed by Brian Jeffrey Icerman, PE, on 11/11/2021.

Printed copies of this document are not considered signed and sealed and the signature must be verified on electronic copies.

_____

Brian J. Icerman, PE, ENV SP

Florida PE No.: 77080

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AADF	Annual Average Daily Flow
ADF	Average Daily Flow
AGM	Annual Geometric Mean
AWT	Advanced Wastewater Treatment
BEBR	University of Florida Bureau of Economic and Business Research
BMAP	Basin Management Action Plan
CIP	Capital Improvement Plan
CRA	Community Redevelopment Area
CWSRF	Clean Water State Revolving Funds
DWTS	Distributed Wastewater Treatment System
DWTU	Distributed Wastewater Treatment Units
ENR	Engineering News-Record
EOPCC	Engineer's Opinion of Probable Construction Costs
EPA	Environmental Protection Agency
ERC	Equivalent Residential Connection
ERU	Equivalent Residential Unit
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FLWMI	Florida Water Management Inventory
FM	Force Main
fps	Feet per second
GIS	Geographic Information System
GPCD	Gallons per Capita per Day
GPD	Gallons per Day
GPM	Gallons per Minute
GPSF	Gallons per Square Foot
lb-N/yr	Pounds of Nitrogen per Year
LF	Linear Feet
LS	Lift Station
MDF	Maximum Daily Flow
MFL	Minimum Flow and Level
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MHI	Median Household Income
MP	Master Plan
MPR	Master Plan Report
NSILT	Nitrogen Source Inventory and Loading Tool

Acronym	Definition
O&M	Operation and Maintenance
OFS	Outstanding Florida Spring
OSTDS	Onsite Sewage Treatment and Disposal Systems
PHF	Peak Hourly Flows
PFA	Priority Focus Area
PPA	Priority Project Area
PPH	Persons per Household
PUD	Planned Unit Development
RCW	Reclaimed Water
SCADA	Supervisory Control and Data Acquisition
SF	Square Foot
SJRWMD	St. Johns River Water Management District
SRF	State Revolving Funds
SRWRF	Southwest Regional Wastewater Reclamation Facility
STPO	Septic Tank Phase-Out
TMDL	Total Maximum Daily Load
UFA	Upper Florida Aquifer
USDA	US Department of Agriculture
USGS	US Geological Survey
WRF	Water Reclamation Facility
WRU	Volusia County Water Resources and Utilities
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

1.1 PURPOSE

Under the 2016 Florida Springs and Aquifer Protection Act, the Florida Department of Environmental Protection (FDEP) is required to adopt Onsite Sewage Treatment and Disposal Systems (OSTDS) remediation plans for Outstanding Florida Springs (OFSs) where FDEP has determined that upgrading or eliminating OSTDS, better known as septic systems, is necessary to achieve nutrient water-quality objectives. Gemini Springs in southwest Volusia County is one of 30 OFSs established in 2016 and one of three established in Volusia County.

The Wastewater Treatment Feasibility Analysis Report (FAR) is a grant-funded project intended to accelerate development of information essential to implementing an effective septic system remediation plan. Key elements of the FAR are inventorying septic systems, assessing wastewater capacity and infrastructure, determining infrastructure upgrades, and evaluating cost-effective projects and financing options.

FDEP has adopted a basin management action plan (BMAP) for Gemini Springs based on the established total maximum daily load (TMDL) for nitrogen. This report does not intend to provide a path to satisfying the entire TMDL goal as it only addresses septic systems. As directed by the 2016 Florida Springs and Aquifer Protection Act, this report focuses on septic systems. The BMAP identifies several other significant sources of nitrogen loading to groundwater. Identifying, evaluating, and recommending alternatives for other sources is beyond the scope of this report, such as fertilizer reduction. We understand the sensitivity of this topic overall, however, for this TMDL and BMAP changes to these loads will be required to meet the overall goal. We look forward to future studies or changes on other sources that will help achieve the overall water quality goals.

1.2 OVERVIEW OF REGULATORY STUDIES

Gemini Springs is classified as a second magnitude spring and consists of two spring vents approximately 150 feet apart in the City of DeBary, Florida, wholly within Volusia County. Gemini Springs feeds into a man-made reservoir through two spring runs, then through Padgett Creek (also known as the Gemini Springs Run), and into Lake Monroe. A part of the St. Johns River system, Gemini Springs is a popular destination for walking, cycling, and ecotourism; thus, maintenance and protection of the springs are high priorities for the surrounding municipalities, Volusia County, and the St. Johns River Water Management District (SJRWMD).

Based on US Geological Survey (USGS) and SJRWMD data collected from 1995 to March 2015 and presented in SJRWMD Technical Publication SJ2017-5, the twin spring vents of Gemini Springs discharge approximately 9.8 cubic feet per second (cfs) or 6.333 million gallons per day (MGD). Initially, three spring vents were present, but one was historically referred to as a seep. The seep was at one time drilled out and converted to an uncased 8-inch-diameter free-flowing well. According to SJRWMD, this well was backfilled to a shallower depth in 1991 and completely abandoned in 2002. The remaining spring vents from west to east are referred to as Spring 1 and Spring 2. Spring 1 appears to flow from a horizontal limestone cavern approximately 6 feet high by 8 feet wide, resulting in a spring pool nearly 15 feet in diameter. Spring 2 is smaller, flowing from a small cavern under a rock ledge approximately 3 feet below the water surface. The run of Spring 1 converges with Spring 2 at the west end of the reservoir, impounded by an

earthen dam and fixed weir structure. The primary water source into Gemini Springs is the Upper Florida Aquifer (UFA), which is a highly transmissive limestone aquifer.

Water throughout the springshed moves between the UFA, approximately 10 to 40 feet beneath land surface, and the surficial aquifer system but is slowed by an intermediate confining unit. The confining layer is perforated by sinkholes that allow the transmission of surface waters into the UFA at a rapid rate. Various modes of testing have indicated that water emanating from Gemini Springs is relatively young.

In 2017, SJRWMD adopted a minimum flow and level (MFL) regime for the springs, citing critical environmental values such as *water quality, aesthetic and scenic attributes, and fish and wildlife habitats*. The springs are currently meeting the MFL.

The earliest water-quality sample collected at Gemini Springs was by Volusia County in 2000; regular, near-monthly sampling has been conducted by the County since 2008. Based on collected data, FDEP determined that Gemini Springs had elevated nutrient concentrations that impaired the body of water. In 2017, FDEP determined the non-impaired limit on the TMDL threshold of nitrate-N to be 0.35 milligram per liter (mg/L).

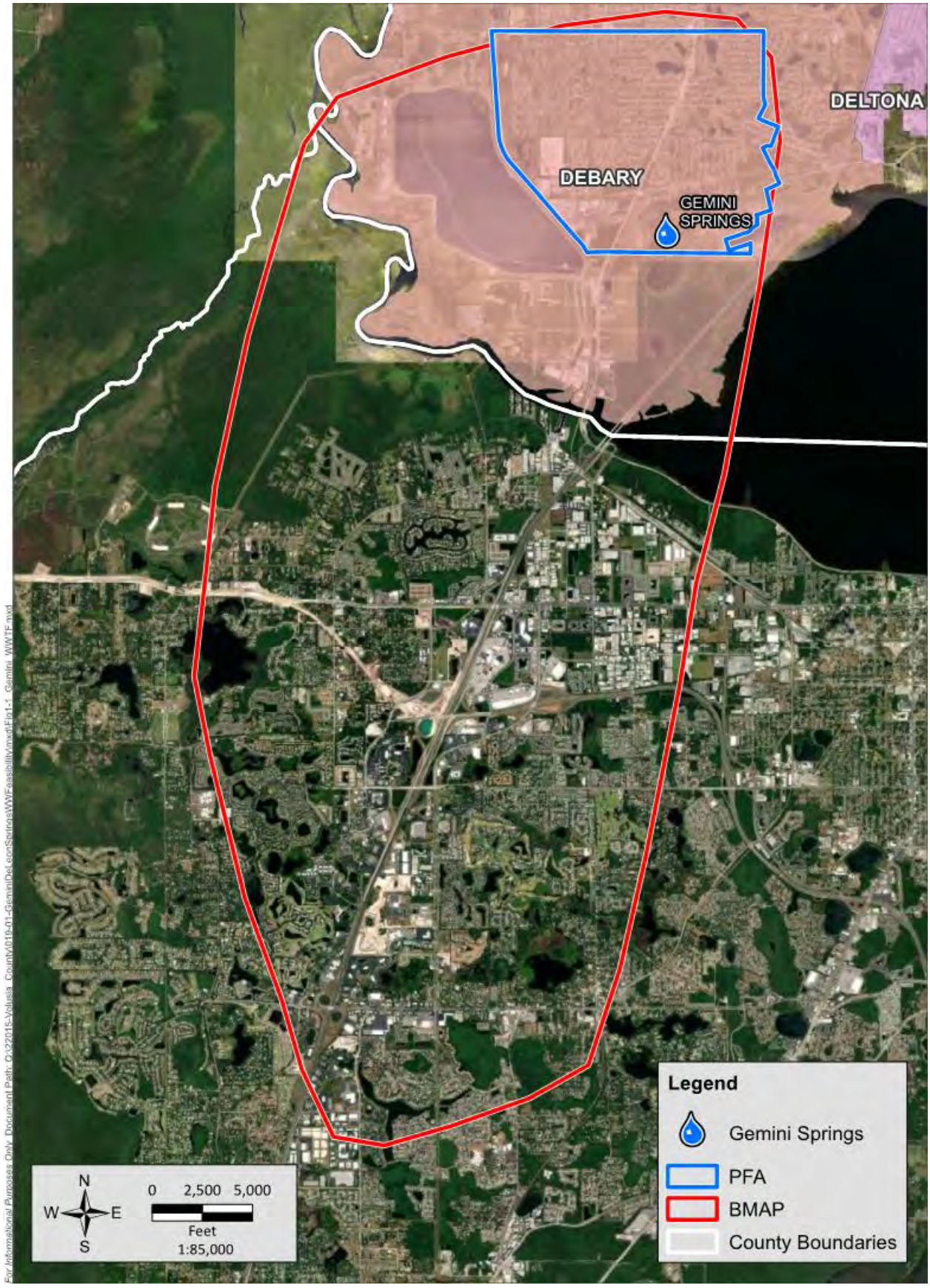
FDEP adopted TMDL constraints in 2017 based on nitrate-nitrite impairment, citing targeted beneficial uses listed as *fish consumption, recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife*. Based on the TMDL, FDEP developed and adopted a BMAP in 2018, proposing a comprehensive set of strategies to achieve the required pollutant-load reduction. The BMAP also includes the designation of a Priority Focus Area (PFA), an area of the basin identified as most vulnerable to pollutant loading. Figure 1-1 presents the location of Gemini Springs and associated BMAP and PFA areas.

The water quality in Gemini Springs, Lake Monroe, and the UFA has a significant impact on the community. The springs and associated reservoir provide recreational and aesthetic benefits to residents and visitors, economic opportunities, and essential habitat for fish and other wildlife. This FAR is part of an effort to improve and protect this crucial natural resource, which impacts ecosystems, fisheries, marine and wildlife habitats, wetlands, the tourism industry, home values, and overall quality of life.

The Gemini Springs springshed and BMAP boundaries extend into Volusia and Seminole Counties. The portion of the Gemini Springs springshed within Volusia County has residential communities and commercial entities with a population of approximately 15,000. Within the PFA, most of these communities do not have central sewer-collection systems and instead use septic systems to treat and dispose of wastewater. To avoid additional damage to the springs created by the dense use of septic systems, the County is evaluating options for removing septic systems and providing centralized sewer collection with treatment at the County's Southwest Regional Wastewater Reclamation Facility (SRWRF) or another municipal wastewater treatment facility.

The adopted TMDL requires a 76-percent reduction in nitrogen loading within 15 years. It proposed to meet the goal by achieving 30 percent of the reduction within 5 years, 80 percent of the reduction within 10 years, and 100 percent of the reduction within 15 years. The largest nitrogen loads to groundwater come from urban turfgrass fertilizer. Based on the BMAP, urban turfgrass fertilizer accounts for 46 percent of the nitrogen load to fertilizer. The second largest contribution is from septic systems, which account for 41 percent of the total nitrogen loading to groundwater.

Figure 1-1 Gemini Springs BMAP and PFA Boundaries

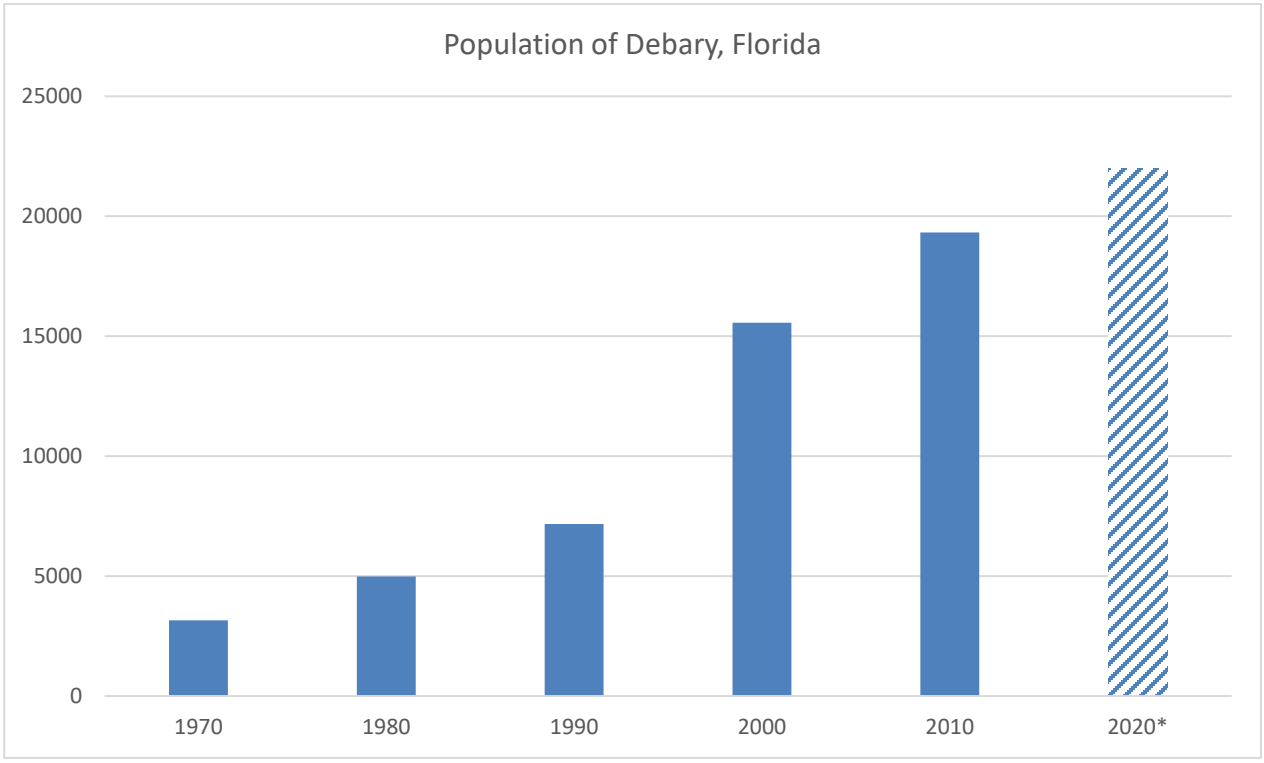


1.3 BACKGROUND

Gemini Springs is approximately one mile northwest of the west shoreline of Lake Monroe within the 221-acre Gemini Springs Park. The park is operated and maintained by Volusia County and provides predominantly land-based recreation for residents and visitors and a critical habitat for fish and wildlife species. The springs were closed to swimming and boating in 2002 due to elevated levels of *Escherichia coli* (E. coli) bacteria. However, fishing is allowed from the designated fishing dock.

Over the last 10 years, 112 water-quality samples were taken at Gemini Springs. According to the TMDL, the annual geometric mean (AGM) concentrations have ranged from 0.97 to 1.33 mg/L at the headsprings. The elevated nitrate concentrations are believed to be the result of the changing land uses throughout the springshed. The portion of the Gemini Springs springshed in Volusia County is wholly within the municipal limits of the City of DeBary. The land use in this part of the springshed has changed significantly from 1974 to present day. The City of DeBary has grown from 3,154 to nearly 22,000 people, which is a more than 500-percent growth over the last half century. Figure 1-2 presents population data collected by the US Census Bureau for DeBary from 1970 to 2010 with an estimated population in 2020 (University of Florida Bureau of Economic and Business Research [BEBR], 2020).

Figure 1-2 Population Growth from 1970 to 2020



Based on FDEP's Nitrogen Source Inventory and Loading Tool (NSILT) modeling conducted for the 2018 BMAP, 41 percent of nitrogen loading in Gemini Springs is attributable to septic systems. The Florida Department of Health's (FDOH) Florida Water Management Inventory (FLWMI), a centralized listing of OSTDS geographic information system (GIS) data, reports 2,749 septic systems within the Volusia County section of the Gemini Springs BMAP for that same year. Typically, septic tanks constructed from steel have a 20- to 30-year useful life. Septic tanks constructed from concrete or plastic may last 30 to 40 years. On average, FDOH

data appears to indicate an overall 20- to 30-year lifespan for septic tanks, with differences stemming from amount of use, type of use, level of maintenance, and groundwater characteristics.

Figure 1-3 presents the number of new OSTDS construction permits issued by the FDOH between 1999 and 2020. FDOH OSTDS permit data show a steep downward trend in new OSTDS construction after 2006, with a gradual uptick beginning again in 2016. Section 6.1 identifies potential septic-to-sewer project areas and summarizes their numbers of lots and numbers of lots with septic systems; the identified areas are approximately 80% developed. If the permitting trend continues, new septic system construction will be on the rise once more and the nitrogen loading attributable to septic systems will increase as well.

Figure 1-3 New Septic System Permits Issued, 1999-2020

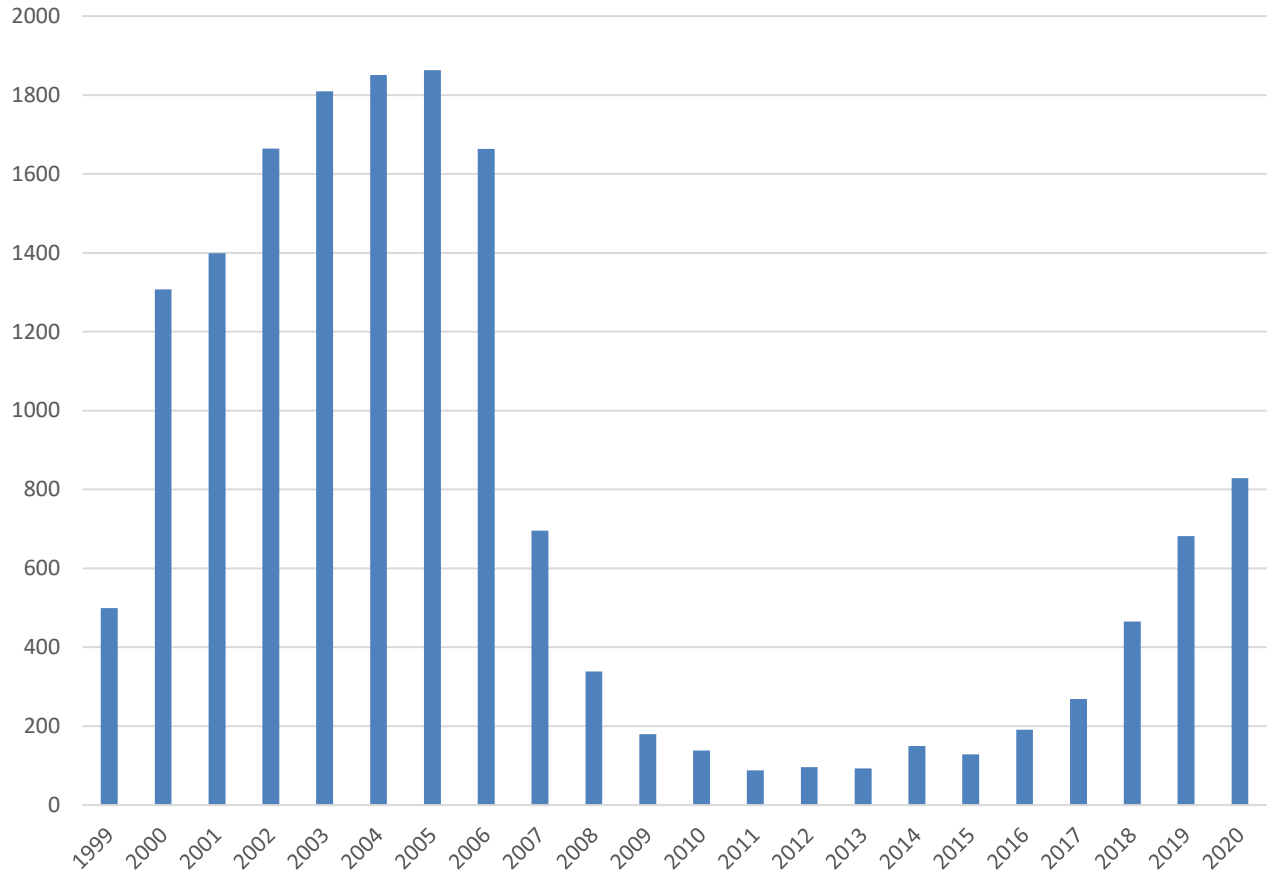
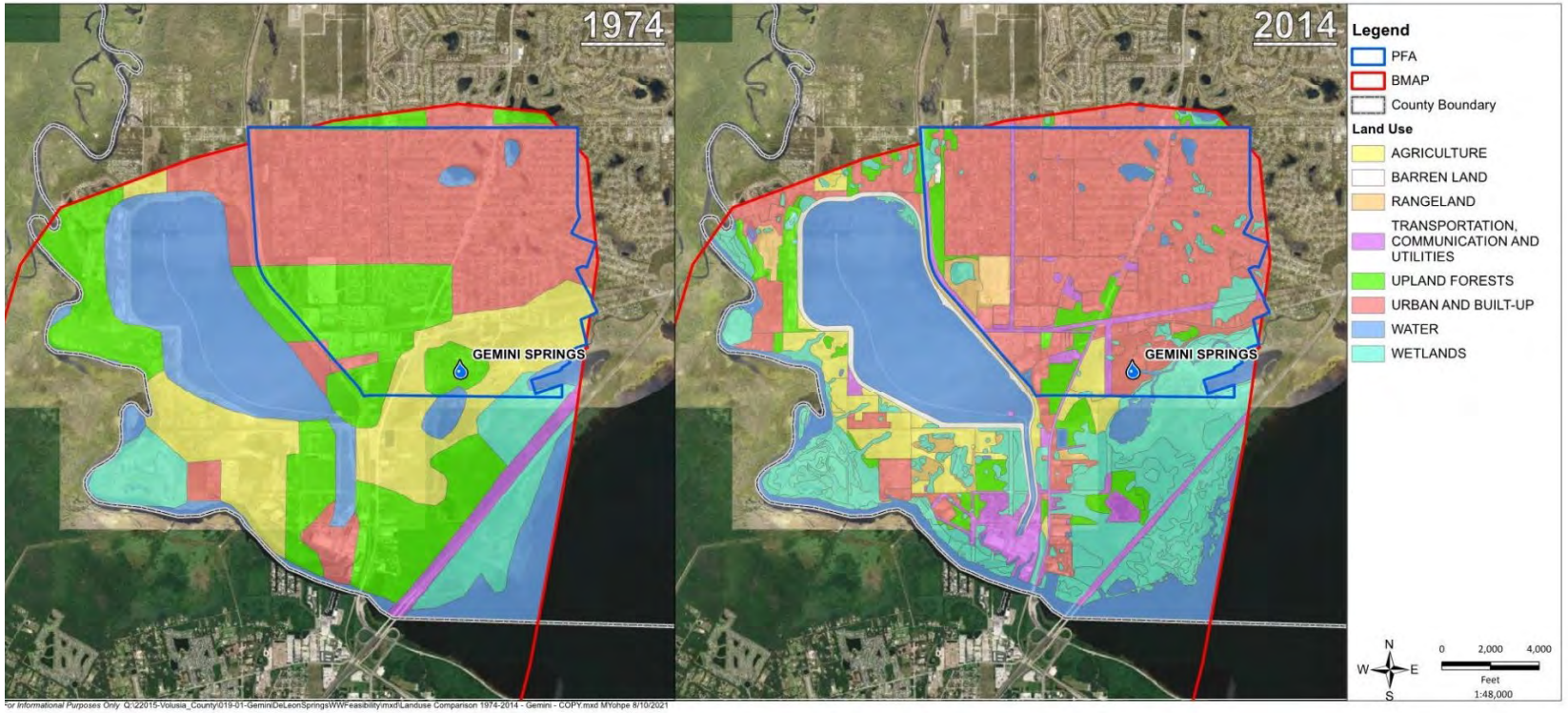


Figure 1-4 presents the comparative land uses in 1974 and in 2014.

Figure 1-4 Land Use in the Volusia County Portion of the Gemini Springs BMAP, 1974 and 2014



1.4 THE SCIENCE ON SEPTIC NUTRIENTS ENTERING GROUNDWATER

Septic systems operate through a multi-step process that includes a septic tank and drainfield (or leachfield). Figure 1-5 depicts how wastewater from the home is typically collected and conveyed to the septic system through drainpipes.

Once in the septic tank, solids settle out while the liquid effluent flows through a series of perforated pipes that are embedded in a drainfield. The effluent percolates into the drainfield and through a deep layer of soil, allowing additional treatment to occur before entering the groundwater.

All septic systems release the nutrients of nitrogen (primarily in the form of ammonia-nitrogen [NH_4^+ -N]) and phosphorus to the groundwater from the drainfield. In a properly operating system, nitrifying bacteria in the upper portions of the drainfield naturally convert ammonia-nitrogen to nitrate-nitrogen (NO_3^- -N) in the presence of oxygen (O_2) in porous soils. As the effluent percolates deeper in the ground, denitrifying bacteria convert the nitrate-nitrogen to nitrogen gas ($N_{2\ gas}$), which escapes to the atmosphere. The denitrification process occurs with a carbon source under conditions without oxygen present.

The soil type and separation depth relative to the groundwater table play significant roles in the septic systems' treatment effectiveness. High porosity soils found in many regions of Florida are saturated due to high groundwater and are typically unsuitable for providing the necessary treatment time. Figure 1-6 shows a septic system with non-ideal treatment. High groundwater creates flooded soils, which reduce oxygen transfer and create low-oxygen levels leading to considerably less removal of nitrogen. In this situation, the conversion of ammonia to nitrate and nitrate to nitrogen gas are impeded, leaving a large percentage of nitrate to persist in the groundwater and ultimately impact surrounding surface waters.

Figure 1-5 Typical Septic System and Drainfield with Ideal Treatment

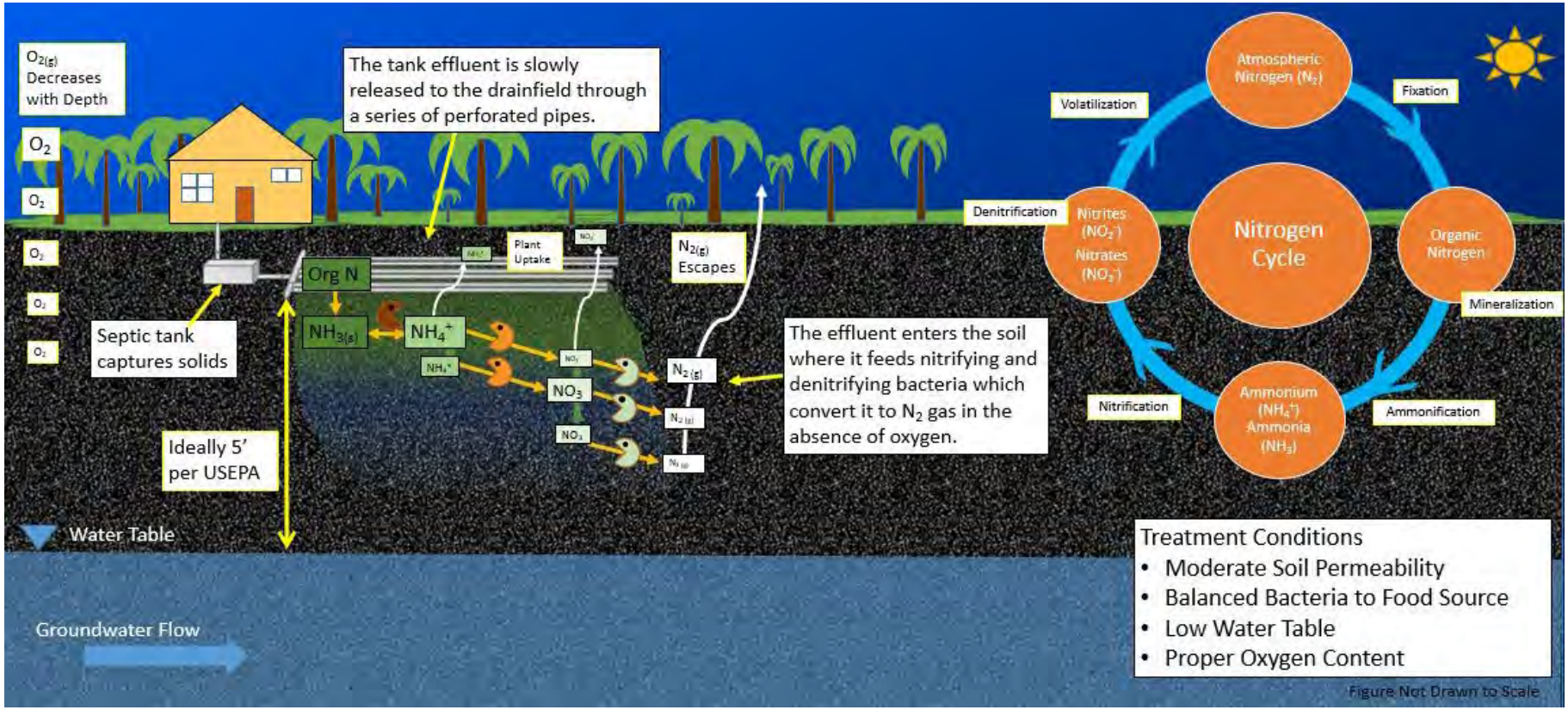
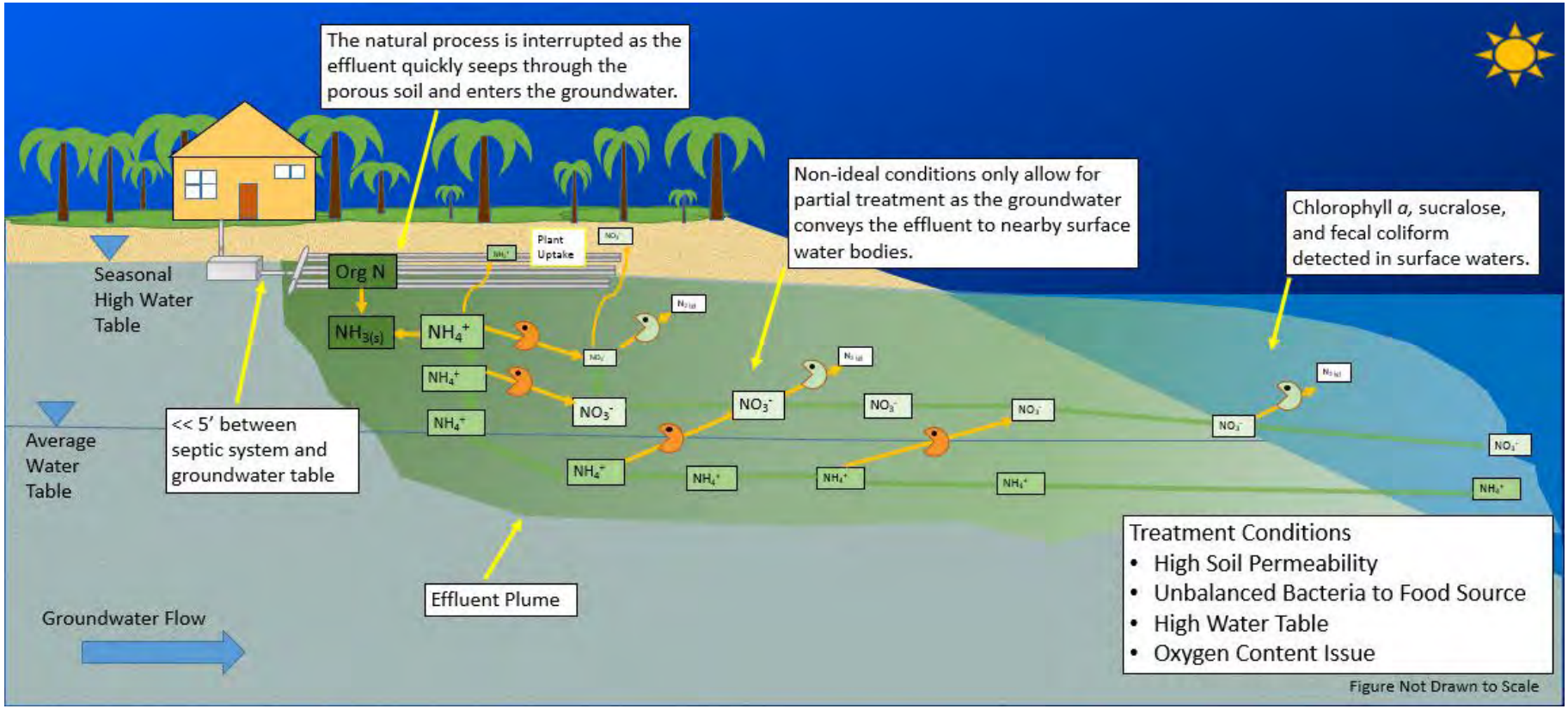


Figure 1-6 Typical Septic System and Drainfield with Non-Ideal Treatment



1.5 WASTEWATER TREATMENT FAR OBJECTIVES

Developing and implementing the FAR is a joint effort between the Volusia County Government, City of Debary, and FDEP. Required under the 2016 Florida Springs and Aquifer Protection Act, this effort is based on the FDEP-adopted BMAP for Gemini Springs and is the first major step in converting the Gemini Springs area from predominantly using septic systems to using centralized sewer collection and treatment or enhanced onsite treatment. The FAR is intended to provide an affordable community solution that addresses the common goals of improving and restoring water quality in Gemini Springs, protecting crucial fish and wildlife habitat, and enhancing the community's quality of life. The following FAR objectives support these BMAP goals:

- Summarize the need to reduce nutrient and bacteria discharges.
- Review and compile historical sewer system and water reclamation facility (WRF) flows and loads data.
- Model and predict system growth.
- Develop detailed consumer and wastewater flow estimates through buildout.
- Review existing wastewater collection and transmission systems.
- Review existing WRFs and prepare infrastructure extension recommendations.
- Develop Capital Improvement Plan (CIP) recommendations based on existing and future infrastructure needs.

1.6 GUIDING CRITERIA FOR EVALUATING SEPTIC-TO-SEWER CONVERSIONS

The FAR addresses the local and regional community's goal of reducing nitrogen loading to Gemini Springs through septic-to-sewer conversions and reduced reliance on traditional septic systems. The conversion area evaluations and prioritizations incorporate the guiding principles of affordability, sustainability, efficiency, and reliability as described below:

- Affordability – Each project identified in the FAR focuses on developing affordable solutions for residents and business owners.
- Sustainability – The FAR incorporates a balanced approach to prioritize septic system replacements to maximize environmental benefits and provide long-term reductions in nutrient loadings in a manner that is sustainable for residents and business owners.
- Efficiency – The FAR considers existing utility infrastructure and implements efficient construction methods to decrease costs on road trenching and repair.
- Reliability – The FAR considers existing wastewater treatment and conveyance infrastructure and identifies which components will require updating to provide a reliable product to the County's residents and businesses.

2 PAST AND PRESENT – DEVELOPMENT OF A SEWER SYSTEM

This Chapter provides a historical perspective of the regional area's sewer system development, a review of private utilities within the service area, and a summary of the present-day sewer system. This Chapter also reviews the ongoing regional wastewater projects in the planning, design, and construction phases.

2.1 SEWER SYSTEM GROWTH AND DEVELOPMENT

Volusia County is in northeast Central Florida, bordered by the St. Johns River to the west and the Atlantic Ocean to the east (Figure 2-1). The County was officially formed in 1854 by the Florida Legislature through the division of Orange County; at that time, Volusia County had fewer than 1,000 residents and the common sewage disposal method consisted of outhouses or privies. The County population grew steadily over the next 100 years, reaching nearly 50,000 residents at the start of World War II. The post-war period was a time of significant growth for the County, with the population tripling between 1950 and 1970. Growth has yet to slow; the 2020 BEBR population estimate was 551,588.

Fifteen public utility providers serve the population of Volusia County – 14 cities and Volusia County Water Resources and Utilities (WRU). Of these providers, nine operate water and/or WWTFs. The remaining smaller cities receive wholesale water supply and wastewater treatment from other larger cities or have no centralized infrastructure. As the population continues to grow and the demand for services rises, widescale septic-to-sewer conversion efforts will be a collaborative effort shared between local municipality, County, and State resources.

A 1990 USGS survey of treated domestic wastewater in Volusia County identified 60,843 active septic systems, 25 domestic WWTFs, and three County-run WWTFs. By the end of 1999, despite County efforts to consolidate WWTFs and expand access to centralized sewer, the number of septic systems had grown to approximately 80,000. The most recent FLWMI estimates that 92,281 septic systems existed in Volusia County in 2018. Based on population growth in known unsewered areas, the number of septic systems is estimated to now be over 100,000.

Overall, WRU provides wastewater collection, treatment, and disposal services for approximately 7 to 8 percent of the countywide population. In 1986, Volusia County purchased a private utility serving the Southwest Volusia County area, and the population of southwest Volusia was expected to expand rapidly over the next 10 years. A master wastewater plan was prepared that recommended the County construct a new, regional WWTF and decommission one of the original private utility's smaller plants. In the ensuing 5 years, WRU completed construction of the new 0.75-MGD SRWRF. The new facility was designed so that it would be easily expandable and cost-effective to meet the continuously growing wastewater needs of the County.

Figure 2-1 Volusia County Geographic Area

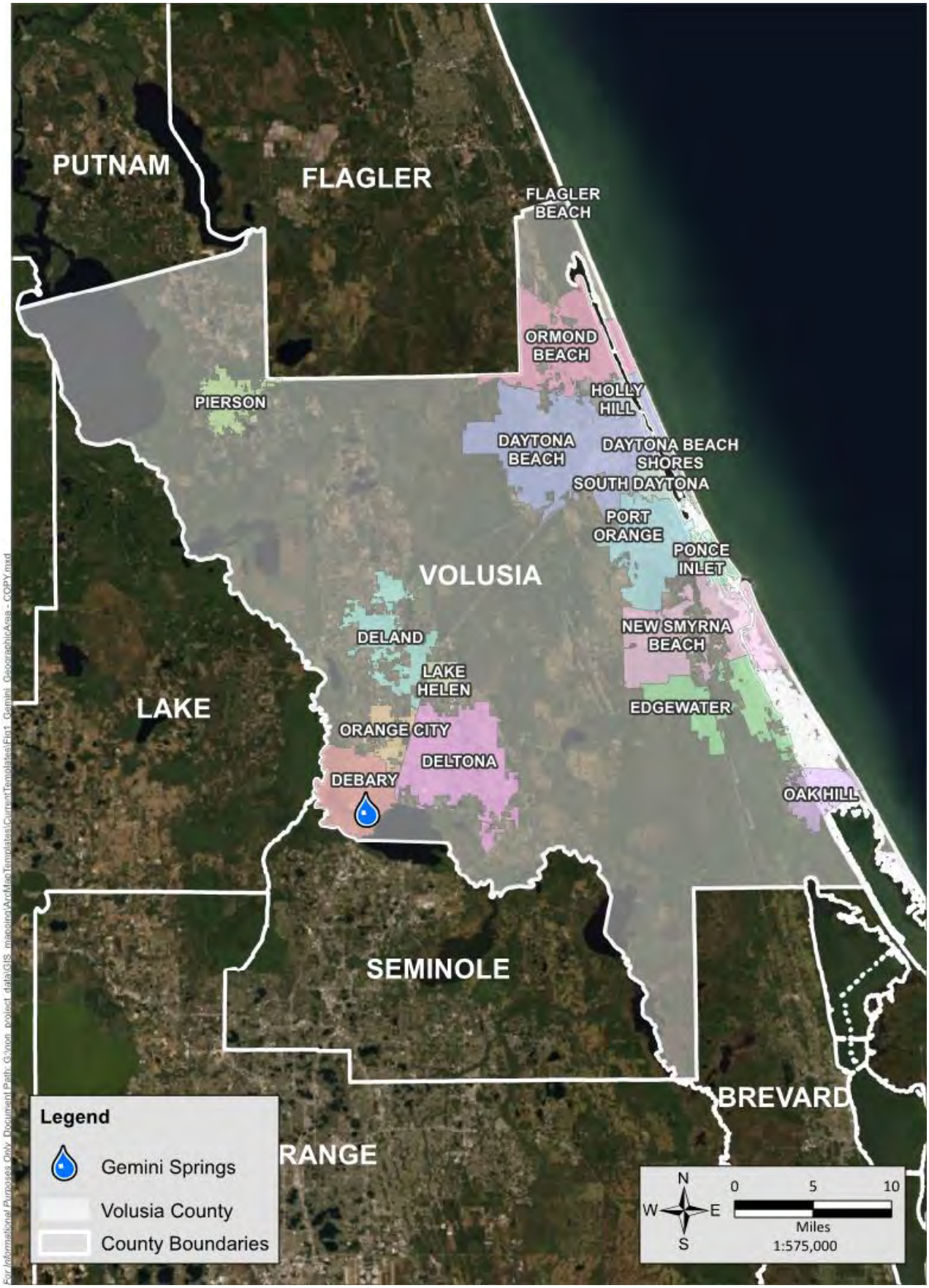
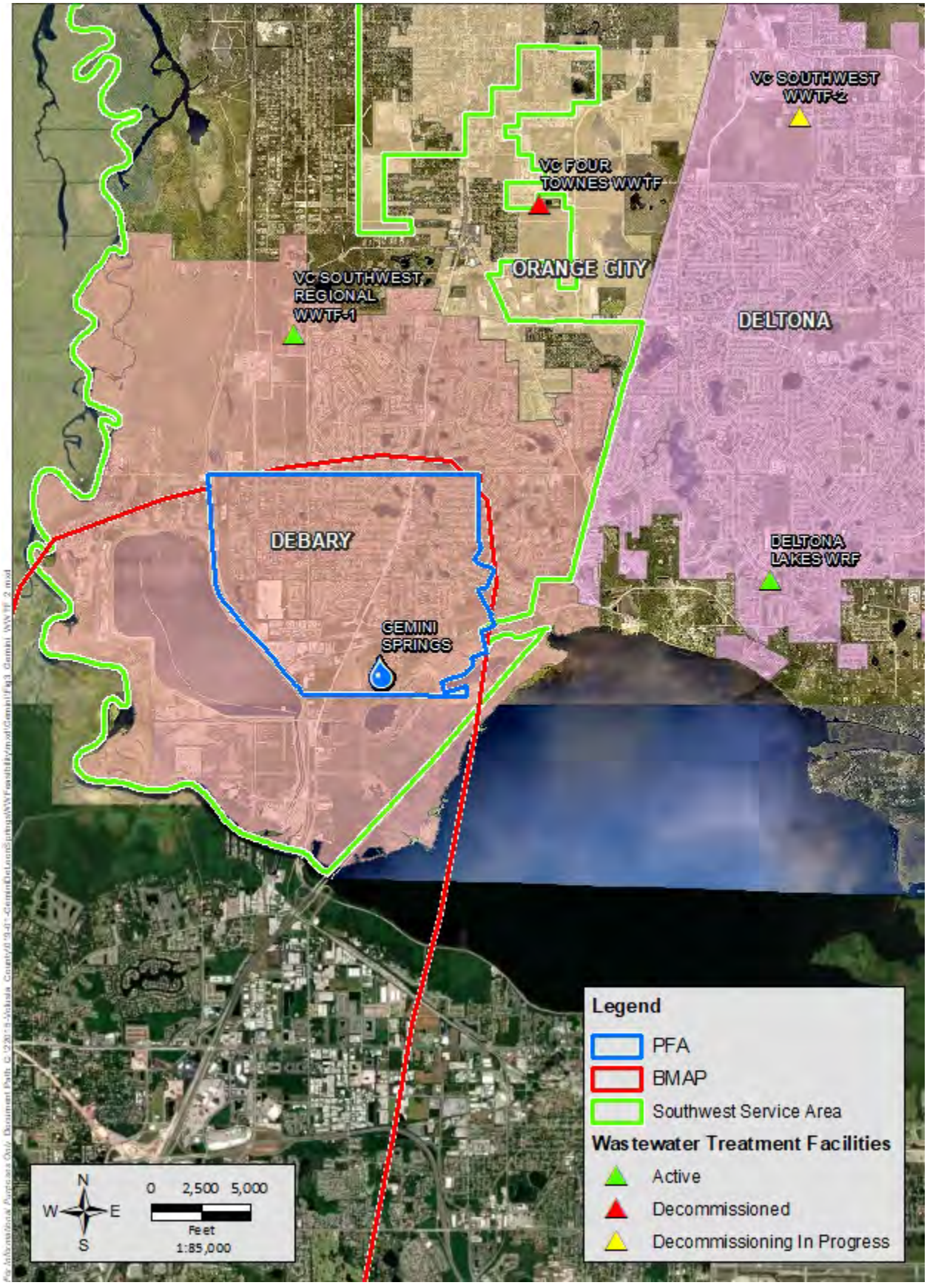


Figure 2-2 shows that according to FDEP's most up-to-date data, Volusia County owns and operates three WWTFs near the Gemini Springs springshed – SRWRF, Deltona North (Southwest #2), and Four Townes (decommissioned). In July 2014, new TMDL regulatory standards were adopted by FDEP for the Blue Springs basin in Volusia County. The new requirements necessitated the conversion of WWTFs treating over 100,000 gallons per day (GPD) from standard to advanced wastewater treatment (AWT). Rather than invest in facility upgrades at both plants near Blue Springs – SRWRF and Four Townes – the County decided to focus attention on expanding plant capacity and converting to AWT at SRWRF and reroute flows from the Four Townes plant, allowing for its eventual decommissioning.

In 2018, the County completed the $12.7-million project at the SRWRF by upgrading to AWT, expanding treatment plant capacity, and expanding the reclaimed water system. The project was made possible through $7.5 million in grant funding provided by FDEP and SJRWMD. Projects are currently in progress to begin transferring flow from the Deltona North WRF to SRWRF, thereby expanding reclaimed water availability and improving water quality by reducing nutrient pollutants within the springshed.

Figure 2-2 Volusia County WWTFs



2.2 PRIVATE UTILITIES WITHIN THE SERVICE AREA

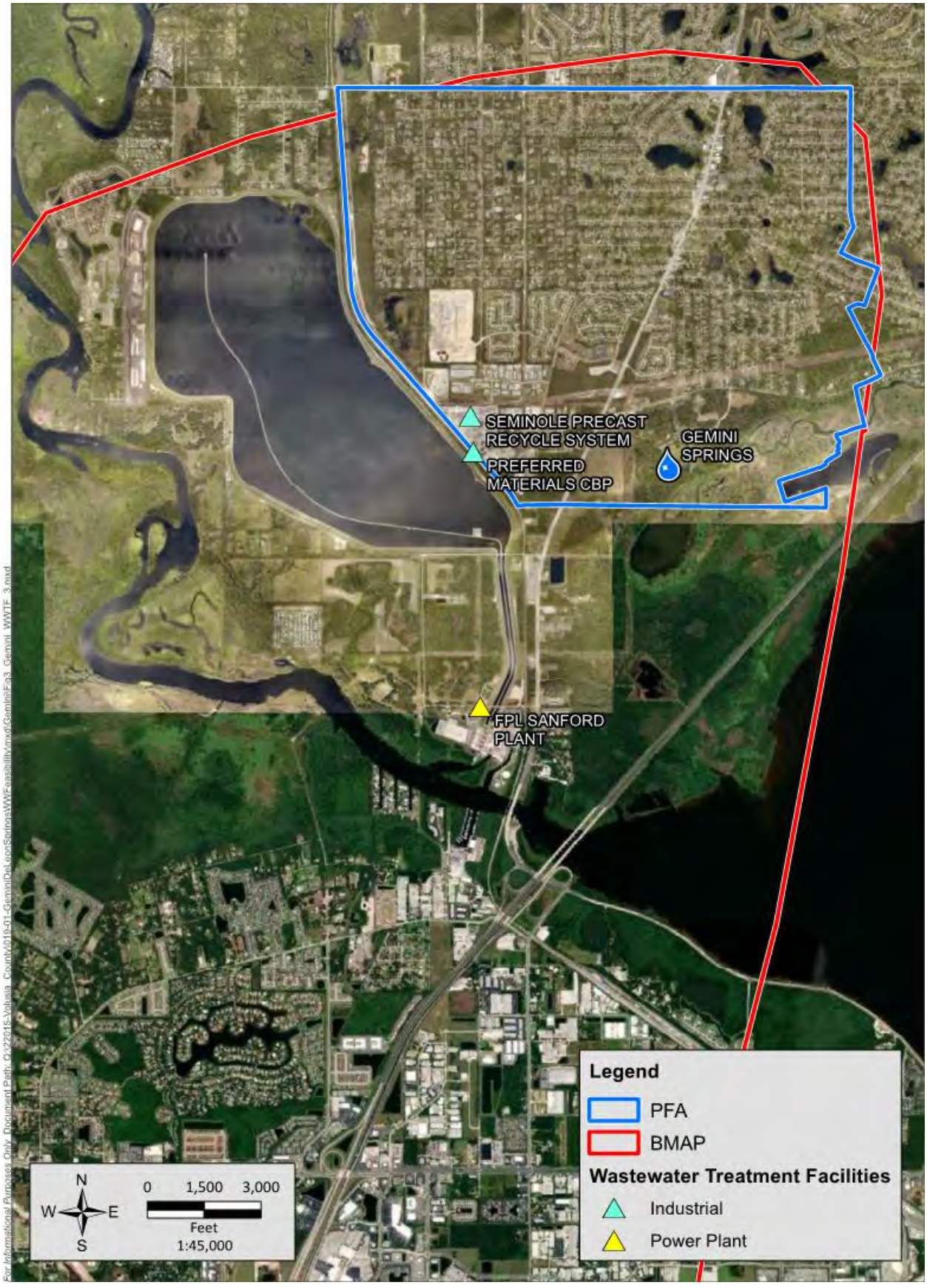
Many small, private package plants continue to operate in Volusia County. Figure 2-3 shows three private facilities within the Gemini Springs BMAP area with wastewater program permits: two industrial and one power plant. Table 2-1 lists the package WWTFs that are currently maintained by private entities. These facilities are not likely to connect into the County's wastewater system in the future. Industrial discharges tend to have poor water quality for wastewater treatment as evidenced by low biological oxygen demand; treating this type of discharge at the SRWRF is not recommended without pretreatment. The power plant's wastewater is predominantly cooling water discharges that are also not recommended for general wastewater treatment. The economic feasibility of potential connections will need to be evaluated.

Table 2-1 Privately Operated Package WWTF Information

Facility ID	Name	Address	Permit Expiration Date
FL0001554	FPL Sanford Plant	950 South US Highway 17-92	9/2/2018
FLG110871	Preferred Materials CBP	300 Benson Junction Road	8/6/2024
FLA175951	Seminole Precast Recycle System	331 Benson Junction Road	12/6/2020

Source: FDEP Wastewater Facility List.

Figure 2-3 WWTFs in Gemini Springs BMAP



2.3 Ongoing Projects and Programs

Volusia County is committed to maintaining and, where feasible, expanding its program of effluent treatment, reuse, and disposal. The County is also committed to protecting and improving the springs and associated waterbodies, focusing on sustainable future development and environmental stewardship. In support of these goals, the County is managing several projects that will impact the sewer system.

2.3.1 Deltona North WWTP Lift Station and Force Main

Due to the low flows and relatively high effluent nutrient concentrations, the County desired to decommission the Deltona North WRF and send flows to the SRWRF. This is projected to achieve significantly lower effluent concentrations and result in significant savings in operation and maintenance expenses. This project is to construct a new lift station and force main to reroute the existing flows. The decommissioning of the Deltona North WWTF does not include taking the existing rapid infiltration basins (RIBs) out of service; they will remain as a backup reuse disposal site for the County's public access reuse (PAR) system during periods when reuse capacity exceeds demand. Construction was substantially completed in mid-2021.

2.3.2 Deltona North RIB Rerate Study

The Deltona North (Southwest 2) WRF has four RIBs that receive reuse water from the County's PAR system. The PAR system is connected to the SRWRF and interconnected with the municipal Deltona Lakes and Deland/Wiley Nash WWTFs. The County is interested in increasing the disposal capacity of the RIBs to divert public access reuse from the interconnected reuse system when the quantity of reuse water significantly exceeds demand. The technical aspects of this project were completed in 2019. The County expects the permit rerate to occur in late 2021 or early 2022 following construction of the Deltona North Wastewater Treatment Plant (WWTP) Lift Station and Force Main project.

2.3.3 Volusia Blue Wetland Recharge Project

The B&H Excavation Site, about 0.5-mile northeast of Blue Spring, was identified as a potential recharge site by the West Volusia Water Suppliers (WVWS) and SJRWMD. The site is an active mine covering about 60 acres that was excavated to approximately 40 to 50 feet below natural grade. The west side of the property borders an existing 10-inch force main owned by Florida Department of Transportation that conveys stormwater discharge from Mill Lake to the St. Johns River. This first phase of this project, completed in December 2018, evaluated the water quality feasibility of using the B&H Excavation Site for recharging between 2 and 4 MGD of reclaimed water from the SRWRF to benefit Blue Spring. In 2020 and 2021 Volusia County led a hydraulic load testing study. The results of this test showed the site would not recharge as much water as anticipated. Despite the field data testing results, the County continues to believe a holistic water quality and water supply approach will be the most financially sustainable over generations. The County will continue to evaluate this site and consider other multi-beneficial projects as opportunities and challenges present themselves.

2.3.4 FISHER PLANT DECOMMISSIONING

Volusia County and the City of Deltona are looking into joint planning to determine operational and financial feasibility of constructing a wastewater force main extension from the City of Deltona's Deltona Lakes WRF (the Fisher Road facility) along Dirksen Road to connect to the County system, thereby allowing for the decommissioning of the aging Fisher plant. The feasibility analysis would also include possible expansion of the County's SRWRF by 1 to 1.5 MGD. Ultimately, the project would produce measurable benefits for the Volusia Blue Spring and Gemini Springs TMDLs, as a new force main along Dirksen Road would provide necessary infrastructure to reach the communities nearest to the spring.

3 RESTORATION OPTIONS

This Chapter reviews different centralized collection system and de-centralized enhanced nitrogen treatment septic remediation alternatives as restoration options for the project area. Chapter 6 presents the cost analyses conducted to determine affordable improvements and efficient implementation sequencing.

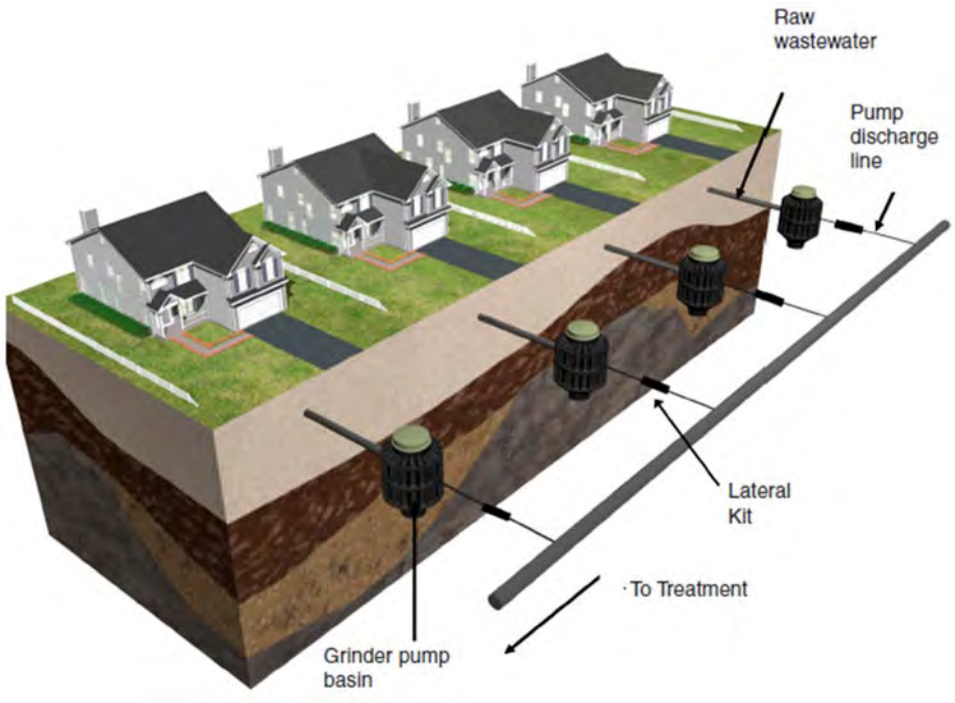
3.1 CENTRALIZED COLLECTION SYSTEM ALTERNATIVES

Sewer collection systems are generally categorized by their transport mechanism, which include pressure, vacuum, and gravity. The most common types of collection systems currently implemented in Florida include grinder pump, vacuum collection, and gravity collection systems. The centralized collection systems evaluated will remove 100% of the nutrient loading to Gemini Springs since these systems will convey the wastewater flows out of the springshed to the County Advance Waste Treatment Facility.

3.1.1 LOW-PRESSURE (GRINDER PUMP SYSTEMS)

Figure 3-1 shows a typical grinder pump system.

Figure 3-1 Grinder Pump System



(Schematic from https://eone.com/sewer-systems/brochures.)

Grinder pump systems consist of conventional drain, waste, and vent piping within an individual residence connected to an existing conventional septic tank or a packaged grinder pump basin. The sewage gravity flows to the existing septic tank or basin. After a given volume of sewage accumulates, the sewage is pumped through a small-diameter force main to a transfer lift station or the WWTP for treatment.

Advantages

- Shallow excavation, which reduces the potential of encountering limerock and groundwater.
- Minimizes community disruptions to street, sidewalks, etc.
- Low infiltration potential.

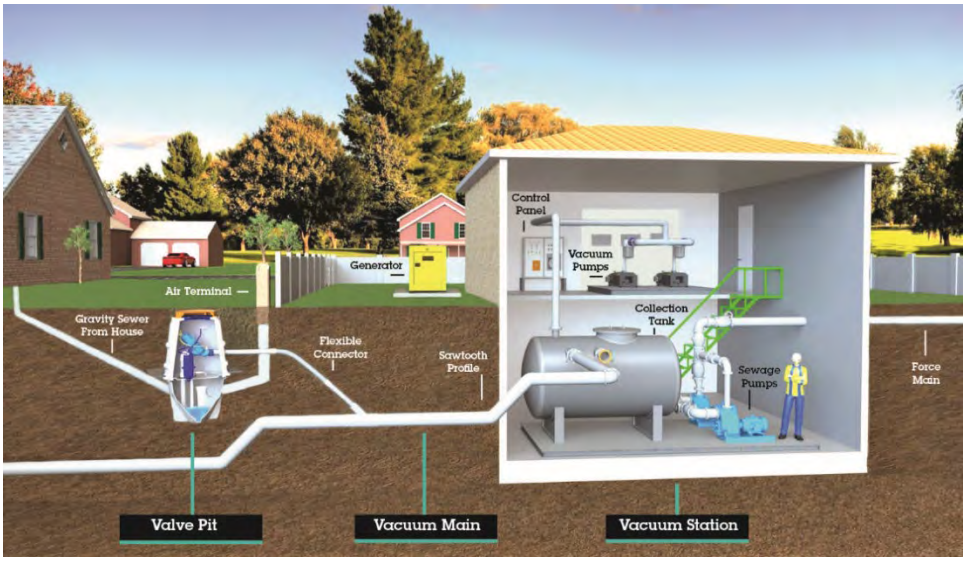
Disadvantages

- May require an easement on each property.
- Requires power supply to each grinder pump.
- May require a dedicated control panel for each grinder pump.
- Operation and maintenance (O&M) costs associated with pumps.

3.1.2 VACUUM COLLECTION SYSTEM

Figure 3-2 shows a typical vacuum sewer system.

Figure 3-2 Vacuum Sewer System



(Schematic from https://www.aqseptence.com/app/en/keybrands/airvac/.)

In a vacuum system, sewage flows by gravity from two to four homes/structures into a valve pit. The valve pit has a pneumatic valve that operates by pressure (no electrical power is required). The valve pit pneumatic valve opens automatically when a given quantity of sewage accumulates in the valve pit. When the valve opens, the sewage in the pit is "vacuumed" into small-diameter gravity piping (minimum of 4 inches in diameter) to the vacuum collection station. The vacuum collection station collects, stores, and pumps the sewage via pressure through a force main to the WWTP.

Advantages

- Shallow excavation, which reduces the potential of encountering limerock and groundwater.
- Minimizes disruptions to street, sidewalks, etc.
- Valves operate pneumatically so power is not required.

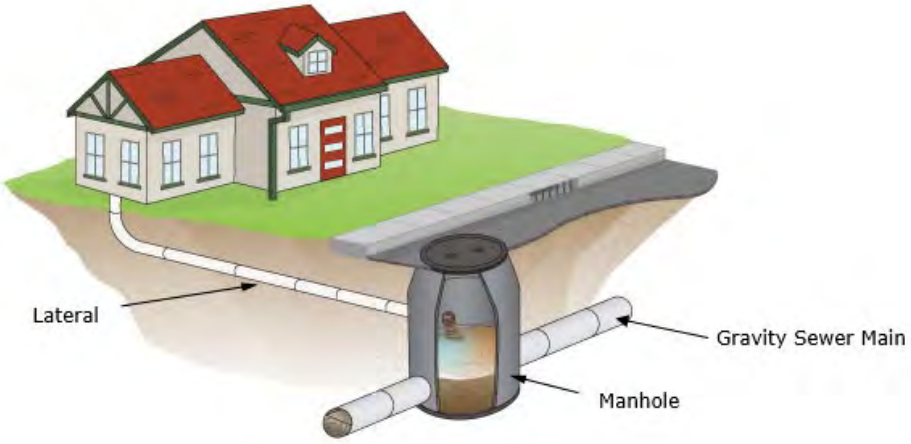
Disadvantages

- Higher O&M costs than gravity sewer.
- Moderate infiltration potential.
- High capital cost for smaller developments.
- More precise construction techniques (sawtooth pattern collection system piping) compared to low-pressure.

3.1.3 Gravity Collection System

Figure 3-3 shows a typical gravity collection system.

Figure 3-3 Gravity Collection System



(Schematic from https://emedia.rmit.edu.au/dlsweb/Toolbox/plumbing/toolbox12_01/units/cpcpdr4001a_sanitary/00_groundwork/page_002.htm.)

Gravity collection systems are a common and traditional method to collect wastewater for public utilities. Sewage flows by gravity from the home through 4-inch sloped service lateral pipes to the gravity sewer mains. Gravity sewer mains are typically 8-inch diameter and larger. Manholes are typically required every 400 feet, at each main intersection, and at changes in flow direction. The network of gravity sewer mains and manholes is considered the gravity collection system. The gravity collection system typically conveys sewage to a transfer lift station that pumps the sewage under pressure to the WWTP for treatment.

Advantages

- Lowest O&M cost.
- Highest long-term reliability.
- Homeowner easements not needed.

Disadvantages

- High capital cost for retrofitting existing neighborhoods.
- Deeper excavations typically required.
- Significant and lengthy community disruptions to streets, sidewalks, driveways, etc.
- Higher infiltration potential.

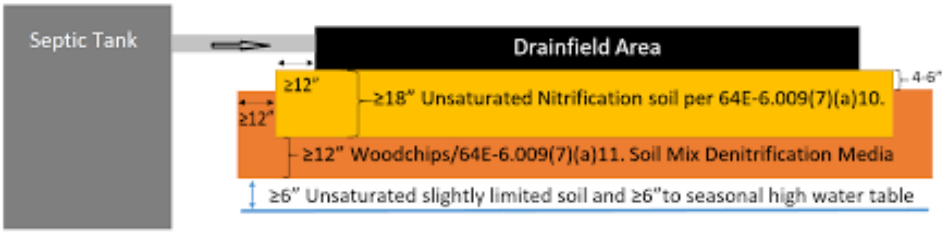
3.2 Enhanced Treatment of Nitrogen Onsite System Alternatives

FDOH has identified allowable enhancements to OSTDS/septic systems that will provide adequate nitrogen-removal rates in accordance with NSF/American National Standards Institute (ANSI) 245: Nitrogen Reduction. That standard covers residential wastewater treatment systems with rated capacities between 400 and 1,500 GPD. Minimum nitrogen reduction of 50 percent must be achieved. Options that provide for the repair, upgrade, or replacement of an existing OSTDS to meet nitrogen-removal requirements include in-ground nitrogen-reducing biofilters, nitrogen-reducing aerobic treatment units (ATUs), and performance-based treatment systems (PBTS).

3.2.1 In-Ground Nitrogen-Reducing Biofilter

Figure 3-4 shows an in-ground nitrogen-reducing biofilter.

Figure 3-4 In-Ground Nitrogen-Reducing Biofilter



(Schematic from https://www.flera.org.)

The in-ground nitrogen-reducing biofilter option is a passive system, which includes a denitrification layer under 18 inches of sand fill, all under the drainfield area. The denitrification layer is made up of a mixture of fine aggregate –coarse sandy loam, sandy loam, loamy sand, fine sandy loam, very fine sand, loamy fine sand, or loamy very fine sand and a lignocellulosic material, chips or shavings of untreated lumber, blended urban waste wood mulch, yellow pine sawdust, 2- to 3-inch wood chips, or other material demonstrated to be effective at denitrification. The denitrification layer is not less than 12 inches thick, extends 12 inches beyond the perimeter of the drainfield, and wraps 12 inches upward. Additionally, the denitrification layer bottom must be 6 inches above the seasonal high groundwater table. During construction, the denitrification layer must be inspected. The denitrification layer requires special repair and maintenance procedures. The denitrification layer must be tested for performance 10 years after installation to determine if media replacement is warranted. These systems are estimated to achieve 65-percent nitrogen removal. These estimates assume the homeowner properly operates and maintains the system.

Advantages

- Treatment occurs on site without the need for a centralized sewer.
- Can be used in conjunction with existing septic tank.
- Potential additional funding may be available.

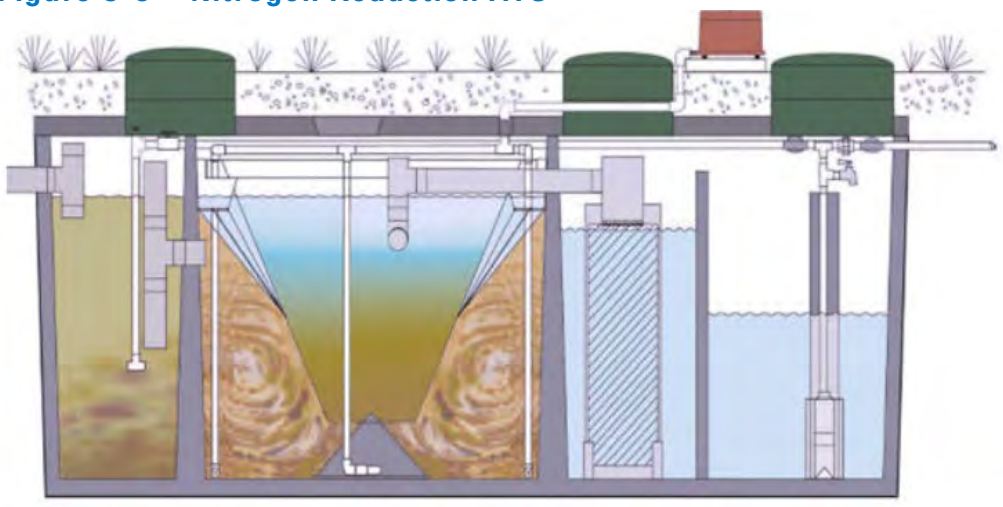
Disadvantages

- Additional O&M requirements for homeowners.
- Limited application due to groundwater clearance requirements.
- Requires more space on each homeowner's property than their existing conventional septic system.

3.2.2 Nitrogen-Reducing ATU

The ATU system is more efficient at processing waste than a conventional septic tank and drainfield. It works by reducing the amount of biological material entering the drainfield. The nitrogen-reducing ATU systems typically involve biological denitrification processes such as mixed biomass using suspended growth, fixed film, or an unsaturated media filter or two-stage segregated biomass. In both processes, treatment is accomplished by bacteria respiration. In the mixed biomass process, recirculation with fresh incoming wastewater is essential for continuous denitrification. The two-stage segregated biomass process requires external carbon or chemical addition. All ATU systems typically consist of a pump, pipes, and diffusers. These systems require a maintenance contract and operating permit from the County health department. Effluent quality laboratory samples are required to be submitted by the maintenance entity every 6 months for residential systems and every 3 months for commercial systems, along with an inspection/maintenance report. FDOH annually inspects the maintenance and performance of the system. These systems are estimated to achieve 65-percent nitrogen removal. These estimates assume the homeowner properly operates and maintains the system. Figure 3-5 shows a nitrogen reduction ATU.

Figure 3-5 Nitrogen Reduction ATU



(Schematic from https://floridaonsitesystemsanddesign.com/hoot-nitrogen-reduction/.)

Advantages

- Treatment occurs on site without the need for a centralized sewer.
- Potential additional funding may be available.

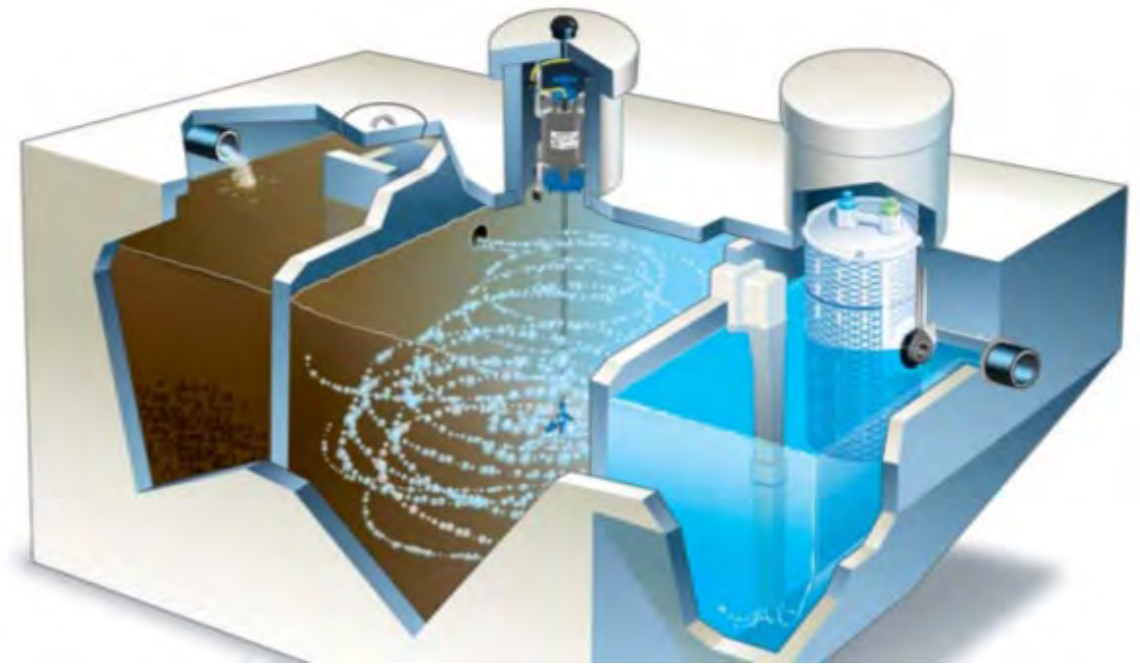
Disadvantages

- Additional O&M requirements for homeowners including an operation license and annual inspections.

3.2.3 Performance-Based Treatment System

The PBTS can include a nitrogen reducing ATU and other components. For example, they may include tanks that percolate effluent down through a medium such as peat moss or synthetic material or chlorinator/dechlorinators, ultraviolet (UV) lights, and/or effluent recirculation. They must be engineer-designed and require an approved maintenance contract and operating permit from the County health department. Effluent quality laboratory samples are required to be submitted by the maintenance entity every 6 months for residential systems and every 3 months for commercial systems, along with an inspection/maintenance report. Different sample levels are required based on the type of PBTS and the specific site conditions. The health department annually inspects the maintenance and performance of the system. These systems are estimated to achieve 65- to 90-percent or more nitrogen removal. These estimates assume the homeowner properly operates and maintains the system. Figure 3-6 shows a PBTS.

Figure 3-6 Performance-Based Treatment System



(Schematic from https://www.norweco.com/wp-content/uploads/2018/10/TNT_Flyer.pdf.)

Advantages

- Treatment occurs on site without the need for a centralized sewer.
- Potential additional funding may be available.

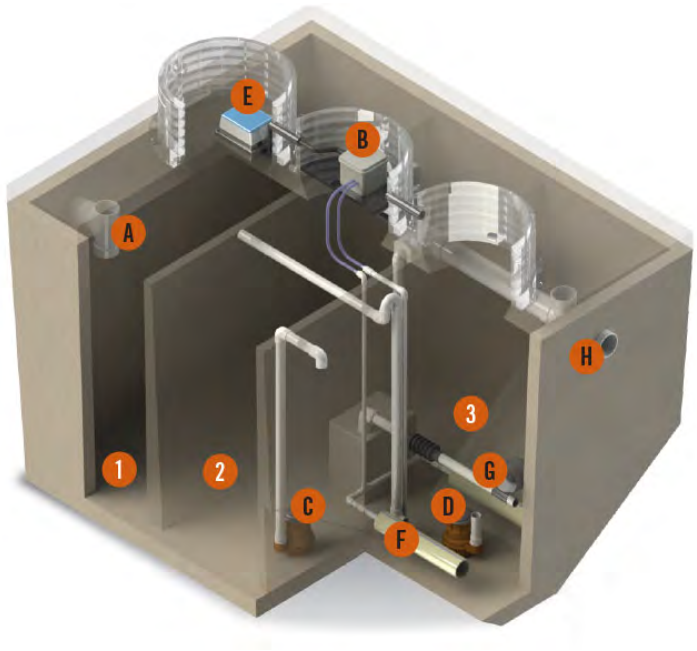
Disadvantages

- Additional O&M requirements for homeowners including an operation license and annual inspections.

3.2.4 Distributed Wastewater Treatment System (DWTS)

Figure 3-7 shows an OnSyte DWTS.

Figure 3-7 Distributed Wastewater Treatment System



1: Sewage enters the Separation Chamber **(1)** from the Inlet **(A)** – primary treatment occurs.

2: Sewage gravity flows into the Dosing Chamber **(2)** – secondary settling occurs.

3: The controller **(B)** determines an appropriate batch size and transfers the selected volume to the Reaction Chamber **(3)**, via a transfer pump **(C) –** Mix-Fill occurs.

4: The air blower **(E)** initiates aeration via twin fine air diffusers **(F)** – Reaction Occurs.

5: Following Settling, Decanting occurs **(G)** – discharging the supernatant through the outlet **(H).**

(Schematic from http://onsyte.com/residential-wastewater-treatment-system/.)

A DWTS is a new category of wastewater treatment system involving centrally managed, decentralized treatment technology that was recently approved by FDEP. Decentralized wastewater treatment is provided by individual distributed wastewater treatment units (DWTUs), which are installed at the point of generation (i.e., individual homes). These DWTUs are virtually connected to the utility using existing wireless data networks and a central management system such as a supervisory control and data acquisition [SCADA] system). In this configuration, the DWTS functions like a public wastewater collection and treatment system but without the physical sewer connection to each end user. These DWTS networks will be permittable for up to 100,000 GPD of total combined flow.

Advantages

- 80 to 90 percent removal of nitrogen (equivalent to secondary wastewater treatment processes).
- Treatment occurs on site without the need for a centralized sewer.
- Potential additional funding may be available.

Disadvantages

- Treatment and water-quality monitoring requirements for utility and its customers.
- Higher O&M costs for utility and its customers.
- Requirement for a maintenance entity.

4 PUBLIC EDUCATION PLAN AND PUBLIC INPUT

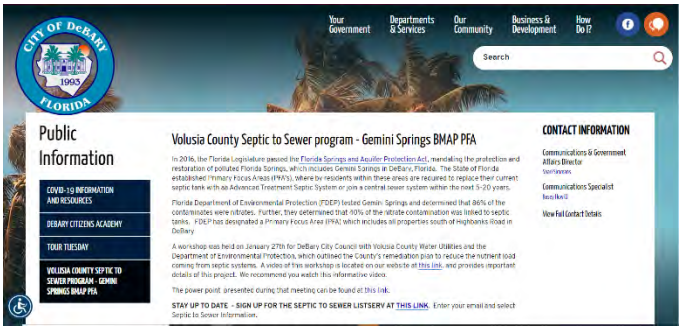
The public education plan for the Gemini Springs FAR, which was delayed due to the impact of COVID-19, included a series of meetings with elected officials and the public.

The PFA for Gemini Springs is entirely within the city limits of the City of DeBary. WRU worked closely with the DeBary City Manager to engage the DeBary City Council and residents of the impacted area to provide information and education sessions regarding the requirements of the 2016 Florida Springs and Aquifer Protection Act.

On January 27, 2021, a presentation was made to the DeBary City Council to provide an overview of the requirements of the 2016 Florida Springs and Aquifer Protection Act and FDEP's expectations associated with the Gemini Springs FAR. Participants presenting to the Council included representatives from WRU, the County's Consultant (Jones Edmunds), and virtual participation from Moira Hamann and Kevin Coyne from FDEP. Appendix A includes a copy of the presentation. This meeting was also publicly broadcast. City Council members came to a greater understanding of the potential financial impact of the advanced septic systems and provided direction to evaluate all lots of less than 1 acre in the PFA for connection to the County's centralized wastewater system as the City does not have a utility.

On February 24, 2021, two socially distanced public outreach sessions were conducted to provide information and education to the public. Impacted residents were noticed of these meetings through direct mail, and meeting notices were published on the City's website. Members of the public were asked to pre-register for the event to maintain a safe environment. The presentation to the public included representatives from the City, WRU, Jones Edmunds, and the Volusia County Department of Health. Once the members of the public had the opportunity to hear the presentation and ask questions, they were invited to fill out a survey to obtain feedback on the issues, concerns, and questions they had about the project. A recording of the public presentation, the presentation document, and the survey are all available on the City's website for additional input by anyone not able to attend the meetings in person. Seventeen surveys were received.

The City of DeBary also implemented a focused information campaign to make sure residents were aware of the public meeting opportunities and to keep the community up to date on the plans for septic-to-sewer projects. The City website includes a dedicated page that allows residents to sign up for notifications on septic-to-sewer information and provides easy access to



the TMDL and BMAP reports. A map is also available that residents can view, which lets them determine if they are in an impacted project area. Additionally, the City maintains a page of answers to frequently asked questions concerning this program and a dedicated email (sewer@debary.org).

Surveys were available for public feedback at in-person meetings and online. The survey consisted of nine questions and a comment section. The intent of the survey was to gain insight into the public's knowledge and concerns relating to the requirements associated with the 2016 Florida Springs and Aquifer Protection Act and OSTDSs. Generally, the public surveyed thought that:

- Septic systems are a problem, as well as other sources of nutrient loading such as farm and lawn/turf grass fertilizer.
- Centralized sewer was preferable to decentralized sewer.
- More information is desired about which homes will be impacted and the associated costs.
- Cost is the biggest concern in progressing.

Appendix A provides a copy of the survey, a summary of the survey results, and a copy of all surveys submitted.

The final public outreach events were presentations of the results of the study (including the public outreach activities) to the DeBary City Council and separately to the Volusia County Council. Members of the public were given an opportunity to speak on this subject. Appendix A also includes materials from the meetings and Appendix C includes subsequent newspaper articles written about the meetings.

76%

76% of respondents feel very or somewhat strongly about protecting the water quality of Gemini Springs

93%

Over 93% of respondents preferred centralized wastewater treatment systems over decentralized wastewater treatment systems

5 POPULATION, WASTEWATER FLOW, AND NUTRIENT LOADING ESTIMATES

This Chapter presents a review of current and projected population growth over a 20-year period of interest, estimated flow projections over the period of interest, and the modeling results of septic tank nutrient discharges in the PFA. Population growth and nutrient loading metrics are presented for the PFA, which represents the area of the Gemini Springs basin where the aquifer is most vulnerable to inputs and where the most connections exist between groundwater and the springs.

Available data from the US Census Bureau, the Volusia County Property Appraiser, SJRWMD, FDEP, and the University of Florida's BEBR were used to develop detailed population estimates, wastewater flow estimates, and nitrogen discharges for present day and buildout scenarios. Septic tank nitrate discharges were estimated using the FDEP NSILT tool.

5.1 CURRENT POPULATION, WASTEWATER FLOW, AND SEPTIC TANK-BASED NITROGEN-LOADING ESTIMATES

Current population estimates were based on a combination of US Census Bureau and BEBR population data. The closest US Census Bureau data are available for the City of DeBary, a city of approximately 20,000 people; the Gemini Springs PFA is wholly within the city limits of DeBary. To further refine the Gemini Springs PFA population, 2,976 residential units within the PFA boundary were identified through the Volusia County Property Appraiser and multiplied by the BEBR estimate of average persons per household (PPH) in Volusia County (2.38). This yielded a current estimated residential population of 7,083 people in the Gemini Springs PFA.

Wastewater flows from the current residential population were estimated based on a combination of existing potable water use data, tax parcel data, and average household size to be 164 GPD average daily flow (ADF) per equivalent residential unit. This amount equates to 68.91 gallons per capita per day (GPCD) and a total projected residential wastewater flow of 0.488 MGD.

Current non-residential wastewater flows were estimated based on parcel data from the Volusia County Property Appraiser and provisions of FDOH Chapter 64-E6, Florida Administrative Code, *Standards for Onsite Sewage Treatment and Disposal Systems*. Non-vacant commercial, industrial, and institutional parcels were identified and based on Department of Revenue use code estimated wastewater flows from each parcel were calculated on a maximum daily flow (MDF) basis. Based on known daily wastewater flow data at the SRWRF, an MDF:ADF factor of 1.3 was applied to the flow to achieve ADF for consistency with residential flow estimates. The total current non-residential wastewater flows within the Gemini Spring PFA were estimated to be 164,000 GPD ADF. Appendix B contains detailed non-residential wastewater flow assumptions.

Nitrogen loads from OSTDSs within Gemini PFA and BMAP were calculated using FDEP's GIS- and spreadsheet-based NSILT tool and the following formula:

$$L = N * P * I * (1 - D) * R$$

Where:

- L is the total nitrogen load reaching the UFA.
- N is the number of OSTDSs in the springshed.
- P is the number of PPH.
- I is the per capita nitrogen load.
- D is the soil attenuation rate.
- R is the Floridan aquifer recharge factor.

The number of OSTDSs were obtained from the FLWMI database for Volusia County. The FLWMI database provides information on which parcels have known septic or sewer, are likely or somewhat likely to have septic or sewer, or their status is unknown. Only those parcels with known, likely, or somewhat likely septic designations were considered and the N for those parcels was 1. If residential properties, those with DOR codes 001-008, were identified by the Volusia County Property Appraiser as having multiple residential units, then those N values were multiplied by the number of residential units to account for larger potential wastewater flows.

The PPH was obtained from BEBR estimates for Volusia County and is estimated to be 2.38. However, the FDEP February 2017 report, *Nitrogen Source Inventory and Loading Estimates for the Volusia Blue Spring and Volusia Blue Spring Run Contributing Area,* notes that many people with a home septic system most likely have access to a facility connected to a sewer system or non-residential septic system during their weekly routine (i.e., work, school, etc.), which thereby reduces nitrogen inputs to their home septic system. To account for this difference, population age information was obtained for the Volusia Blue report from the 2010 census; in Volusia County, 61.1 percent of the population is of school or working age and, according to the Bureau of Labor Statistics, spend 43.5 hours (or 25.9 percent) of the week away from home. Applying these values, the effective household population in Volusia County is reduced by 15.8 percent, yielding an adjusted P of 2.00 for all residential parcels.

An equivalent PPH was also calculated for non-residential properties. Wastewater flow estimates for each non-residential parcel were calculated above and divided by the per capita wastewater estimate for Volusia County, 68.91 GPCD ADF, to achieve an equivalency. These values were used as P for non-residential properties.

Multiple literature sources, including the US Environmental Protection Agency, have reported the per capita nitrogen load to OSTDS as 9.012 pounds of nitrogen per year. This value was used for I.

The soil attenuation rate accounts for natural nitrogen removal in the soil profile and varies throughout Volusia County, with literature values ranging from 10 to 50 percent. The value used by FDEP for all NSILT analyses is 50 percent; therefore, a value of 0.5 was used for D.

The Floridan aquifer recharge factor is based on the recharge rates at each septic tank location, accounting for reactive nitrogen losses along the travel path to and from the

OSTDS to the UFA. SJRWMD developed a UFA Recharge assessment in 2015, detailed in *Publication No. SJ2016-FSI*, which identifies areas of high, medium, and low recharge and discharge. High recharge, greater than or equal to 10 inches per year, would indicate low nitrogen attenuation and is assigned an R factor of 0.9. Medium recharge, 3 to 10 inches per year, is assigned an R factor of 0.5, and low recharge, 0 to 3 inches per year, is assigned an R factor of 0.1. Areas identified as discharge zones are presumed to be areas where the UFA is artesian (upward potentiometric gradient), indicating no net nitrogen loading to the aquifer; these were assigned an R factor of 0. Over 300 parcels reviewed for this assessment fit into multiple recharge zones, but the FLWMI data do not indicate the location of an OSTDS, just the parcel it is on. Therefore, R factors for these parcels were calculated based on a weighted average – using area of parcel within each area of recharge – to achieve a single R factor for each.

Each value was input into the above formula to achieve a final L. The estimated nitrogen loading from all OSTDS in the Gemini Springs PFA is 20,177 pounds of nitrogen per year.

5.2 Buildout Population and Wastewater Flow

Projected population growth was calculated in 5-year increments from 2020 to 2040. Table 5-1 shows low, medium, and high BEBR estimated growth rates for overall Volusia County population growth through 2045. The medium growth rate was selected for use in this assessment because it most closely resembles historic growth rates in Volusia County.

Table 5-1 BEBR Population Growth Projections for Volusia County

Volusia County[1]	2020	2025	2030	2035	2040	2045
Low	527,100	542,000	552,400	559,900	565,000	568,200
Medium	544,100	571,700	594,300	613,600	629,900	644,600
High	559,700	602,500	642,900	680,600	715,800	748,800

[1]Growth projections based on Volusia County 2019 population estimate of 531,062.

Table 5-2 shows residential population growth projected through 2040 based on the selected medium BEBR growth rate. The table includes projected potential wastewater flows from the population estimates based on 68.91 GPCD.

Table 5-2 Projected Residential Population and Wastewater Flows

Gemini PFA	2019 Estimate	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection
Residential Population	7,083	7,168	7,514	7,800	8,045	8,253
Wastewater Flows (MGD)	0.488	0.494	0.518	0.538	0.554	0.569

Non-residential wastewater flows were projected based on the same presumed rate of growth as the residential wastewater flows. Table 5-3 shows, for ease of calculations, that non-residential demand was converted to an equivalency based on GPCD. This equivalency was projected at the selected BEBR growth rate through 2040 and projected wastewater flows were calculated based on the equivalency and the established GPCD.

Table 5-3 Projected Non-Residential Population and Wastewater Flows

Gemini PFA	2019 Estimate	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection
Population Equivalency	2,380	2,409	2,525	2,621	2,703	2,773
Wastewater Flows (MGD)	0.164	0.166	0.174	0.181	0.186	0.191

6 RESTORATION PROJECT IDENTIFICATION, PRIORITIZATION, AND IMPLEMENTATION

This Chapter details the development of OSTDS remediation priority project areas (PPAs), PPA prioritization, and project implementation. Initial project recommendations, nutrient load reduction estimates, and construction cost estimates are provided for each PPA to facilitate project prioritization.

6.1 PROJECT AREA IDENTIFICATION

Figure 6-1 shows three PPAs, which have been identified as the primary areas of focus for specific OSTDS remediation projects. These areas were developed based on OSTDS density, proximity to existing infrastructure, development potential, and stakeholder input. Table 6-1 lists the PPA name, total number of lots, estimated number of lots with septic systems, and recommended OSTDS remediation project. The number of lots is from the Volusia County Property Appraiser and the number of septic systems is from the FLWMI database based on parcel attributes of *known septic*, *likely septic*, and *somewhat likely septic*.

Within each project area, multiple OSTDS remediation strategies were evaluated: gravity sewer, low pressure, vacuum sewer, and enhanced OSTDS. Evaluation of these options was based on proximity to existing centralized sewer, average lot sizes, lot elevations, and project costs. The recommended OSTDS remediation strategy for all three PPAs is vacuum sewer. The community made it clear that it preferred a centralized approach instead of requiring each resident to tackle this challenge alone. Based on the estimated construction costs and lower resident impacts during construction, vacuum sewer was selected as the preferred retrofit option.

Jones Edmunds developed an Engineer's Opinion of Probable Construction Cost (EOPCC) for each PPA based on a conceptual layout of the proposed wastewater infrastructure. This cost opinion includes sitework, mobilization/demobilization, maintenance of traffic, dewatering, and performance bonding. EOPCCs also include the costs of abandoning the existing septic tanks and constructing on-lot connections. These cost opinions do not include the use of capitalized interest, inflation, or contingencies.

The EOPCC's accuracy range depends on the level of design completed according to the Association for the Advancement of Cost Engineering International's *Cost Estimate Classification System (Recommended Practice No. 18R-97)*. The classifications depend on the level of project definition, with Class 1 being the highest level of definition and Class 5 being the lowest level of definition. A conceptual design for each project is defined as Class 5, with a range of accuracy of -30 to +50 percent. Table 6-2 presents the EOPCC, which was developed as a budgetary opinion of probable cost for each option.

An NSILT analysis was also performed for the PPAs to determine the estimated nitrogen loading to be removed. The total nitrogen load reduction through the implementation of all three PPAs is expected to be roughly 18,482 pounds TN per year.

Figure 6-1 Gemini Springs PPAs

Table 6-1 Priority Project Areas

Project Area	# Lots	# Septic Lots	Recommended System Type
Lake Marie Estates	863	788	Vacuum
Plantation Estates	949	796	Vacuum
Vistas	695	396	Vacuum

Table 6-2 EOPCC

Project Area	# Lots	# Septic Lots	Cost/Lot ($)	Cost/Septic ($)	Total Project Cost ($)	-30% ($)	50% ($)
Lake Marie Estates	863	788	22,596	24,746	19,500,000	13,650,000	29,250,000
Plantation Estates	949	796	21,075	25,126	20,000,000	14,000,000	30,000,000
Vistas	695	396	20,863	36,616	14,500,000	10,150,000	21,750,000

6.2 PROJECT AREA PRIORITIZATION

Based on discussions during the community workshops and meetings with both City of DeBary and Volusia County staff, we understand that the community's goal is to introduce a centralized sewer system for all parcels less than 1 acre currently served by septic tanks inside the PFA. The community is ready to initiate this project as quickly as it can be funded to mitigate residents investing in septic tank upgrades or maintenance projects only to have their tank abandoned within several years. Based on this guidance, we are recommending all the lots be placed into a rolling 5-year plan. The rolling 5-year plan will allow the community to complete this project in an efficient manner in the first 5 years that grant or legislative funding is available.

The community is pleased that this project will satisfy the septic tank nitrogen loading reduction requirements in the BMAP and provide the residents with a sustainable long-term wastewater system. In coordination with County staff and City leadership, we concluded the Lake Marie Estates PPA should be the top-ranked area since this PPA is located nearest to the County's existing wastewater transmission system.

7 FUNDING AND FINANCE (PROVIDED BY RAFTELIS)

One objective of the Gemini Springs FAR is to develop a realistic funding strategy that apportions just, equitable, and affordable costs to property owners within City of Debary while not having an adverse effect on existing WRU ratepayers within City of Debary. This Chapter develops a funding plan and roadmap based on the County's service area characteristics. The constraints of this goal include uncertainty of outside funding sources, construction cost schedules, and public acceptance.

7.1 AFFORDABILITY

The water industry has made various attempts to define the concept of affordability. The industry literature generally links water and sewer bills to median household income (MHI). Although this is an imperfect method, a framework is provided from which judging the cost of providing water and sewer service can begin. When discussing affordability, other factors to be considered are income, property value, local cost of living, and economic conditions.

The industry literature on affordability has historically calculated the water and sewer bill as a percentage of local MHI statistics. This methodology standardizes affordability comparisons across regions and gauges a utility's "all-in" costs to ratepayers. The all-in utility payments described herein include monthly water and sewer service bills, property assessments, and other methods used to collect utility revenues. For water and sewer services, the benchmark for affordability has historically been set at 4.5 percent of MHI. For Gemini Springs, various MHI geographic measures could be used including the City of DeBary, the entire Volusia County, or census tract data more local to Gemini Springs. Table 7-1 summarizes the 2019 MHI for these various geographic areas:

Table 7-1 2019 Median Household Income Statistics

Description[1]	Volusia County	City of DeBary	Census Tract 909.02	Census Tract 909.04
Median Household Income	$49,494	$65,316	$59,575	$69,590

[1] 2019 data obtained from US Census Bureau's data.census.gov

As indicated above, at least two census tracts include properties within Gemini Springs: Census Tracts 909.02 and 909.04. The MHI for these two areas varies substantially, ranging from $59,575 and $69,590. Both census tract MHI's exceed the overall County MHI of $49,494; therefore, the County amounts were used for the affordability analysis to be conservative.

Applying the affordability benchmark of 4.5 percent to the County MHI yields $186 in monthly payments ($2,227 annually) as an upper limit affordability target. The water and sewer monthly utility bill, under the County's unsoftened rates, of $74 (approximately $26 for water and $48 for sewer) assuming a residential customer using 5,000 gallons, results in a maximum of $112 per month remaining for sewer assessments and other direct property owner contribution. As noted further in this Chapter, the prospective assessment to property owners is well below this maximum target.

Other factors that should be considered in this affordability discussion include:

- **Property Value:** Central sewer adds value not only to developed properties but to undeveloped properties as well. In certain situations, septic tank development within neighborhoods can be limited based on proximity to potable drinking water wells on adjacent lots. These limitations inhibit the ability to construct on these lots and can essentially render them undevelopable, severely reducing the properties' values. Central sewer eliminates these limitations, and property values across the neighborhood are increased.
- **Septic Tank Maintenance:** Another consideration is the cost avoidance from owning and operating a septic tank and alleviating risks associated with a septic tank failure. Septic tanks have a limited lifespan and can be costly to repair or replace, especially when compared to the MHI levels established above.
- **Environmental Implications:** One other primary factor to consider is the future environmental implications from the current level of septic tanks and the additional septic tanks from future development. With a growing population and an already strained natural waterway system, WRU will only be able to manage growth and future wastewater treatment by making central sewer available.

7.2 Sewer System Costs

This section summarizes the current value costs of constructing sewer systems for the three PPAs recommended for the Gemini Springs PFA. The cost to develop the new sewer collection system in 2021 dollars is approximately $54 million (excluding transmission system costs). As shown below, the analysis of these three PPAs include 2,508 lots. The analysis assumes 77 percent, or 1,935 of those lots, have OSTDS. Table 7-2 provides the cost and lot breakdown for the three recommended PFAs.

Table 7-2 Recommended PPAs and Project Costs

PPA	Lots	OSTDS	Project Costs (w/out Transmission)
Lake Marie Estates	864	787	$19,500,000
Plantation Estates	950	755	$20,000,000
Vistas	694	393	$14,500,000
Totals	**2,508**	**1,935**	**$54,000,000**

7.3 Funding Options

Funding for central sewer includes two elements: 1) the funding of infrastructure improvements and associated planning, design, and project management, and 2) the methods by which any borrowed funds for such infrastructure are repaid by property owners, end users, and/or other future revenue streams. The funding sources for the former include loans, bonds, grants, taxes, etc., and the latter includes the assessments, loan installments, and rates that support the repayment of debt obligations. This section discusses several funding sources starting with the infrastructure funding and followed by the future revenue streams to support debt repayment.

7.3.1 State Appropriation Funds and Grants

The State Legislature and the Governor's Office have had significant interest in the impact of septic tanks on the State's sensitive water bodies such as Gemini Springs. FDEP recognizes the financial magnitude of the septic-to-sewer need in Florida and the support that will be required to address this issue throughout the State. To assist local government in progressing septic-to-sewer programs, the State has dedicated funding from state and federal resources toward the elimination of septic tanks. With proactive lobbying efforts, the City of DeBary and Volusia County could take advantage of grant dollars to mitigate the cost of septic-to-sewer projects.

State and federal bodies such as water management districts, FDEP, the US Environmental Protection Agency (EPA), the US Department of Agriculture (USDA), and other agencies will often sponsor programs that include grants or loan forgiveness elements that do not require repayment. Although repayment is not required with grant programs, the City and County may still experience a certain level of administrative and other costs pursuing and executing grants.

7.3.2 State Revolving Fund (SRF) Loans

FDEP administers the Clean Water State Revolving Fund (CWSRF) loan program for financing public sewer utility infrastructure projects. The SRF financing rate for clean water projects is determined using a formula that includes the Bond Buyer 20-Bond GO Index average market rate[1]. In June 2021, the CWSRF annual average rate was as low as 0.02 percent, depending on census tract and other SRF affordability indices. This current level of interest is almost cost-free, but SRF loan repayment terms are typically limited to 20 years or less. Also, the principal and interest payments cannot be tailored around the issuer's existing debt service structure to level overall debt payments. SRF loan agreements require that rates be sufficient to provide for at least a 1.15 annual debt service coverage.

7.3.3 Bonds

The traditional method for utilities to finance infrastructure programs is to issue revenue bonds. Public utilities typically issue tax-exempt revenue bonds that provide tax savings for investors and thus attract lower interest rates than conventional bonds that are subject to income taxes from the investor. The term *revenue bond* is used since the primary pledge of repayment is a revenue stream associated with the infrastructure improvements. The interest rate on revenue bonds can vary depending on the issuer's credit rating, bond maturity structure, economic conditions, and other factors. Since the interest rate is typically substantially higher than SRF loans, the advantage to revenue bonds is the

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[1] FDEP. 2021. CWSRF Program. Accessed at: https://floridadep.gov/wra/srf/content/cwsrf-program. The clean water SRF Financing Rate Formula is:

FR = MR - 4 + (4/(1+(100/AI)3)) - 1/Log(P)

Where: FR = Financing Rate.
MR = Market Rate.
AI = Affordability Index.
P = Population served or to be served by the sponsor.

repayment structure can be tailored to meet the utilities' short- and long-term needs and existing debt repayment structure. A drawback of revenues bonds are the issuance costs associated with the bonds. Management, legal, financial, consulting, and engineering fees, along with other issuance costs inherent in this type of debt, generally increase the issuer's costs. Unlike SRF loans, which are 2-percent of the total loan amount, issuance costs on revenue bonds can vary depending on the costs mentioned above.

7.3.4 Sales Tax

Pursuant to Section 212.055 of the Florida Statute (FS), the governing authority in each Florida county may levy a discretionary sales surtax of 0.5 or 1 percent to fund infrastructure projects, contingent on a successful referendum. Proceeds from the discretionary sales tax may be used toward capital outlays associated with construction, reconstruction, or improvement of public facilities that have a life expectancy of 5 years or more; any related land acquisition, land improvement, design, and engineering costs; and all other professional and related costs required to bring the public facilities into service. In Florida, discretionary sales tax revenue has been used toward utility infrastructure in Sarasota, Hillsborough, Monroe, and Brevard Counties. To date, Volusia County voters have not approved an infrastructure sales tax surcharge; therefore, these funds are not available for the Gemini Springs program.

7.3.5 MSBU/Assessment on Septic-to-Sewer Properties

Due to the localized nature of the costs and benefits of central sewer installation, local governing bodies often impose special assessments on the property and typically collect such assessments through the annual tax bill administered through the tax collector's office. The procedure for imposing special assessments in Florida are set forth in Chapter 197, FS. In addition to public hearing, notification, and other procedural matters, special assessments imposed on a property must meet a two-pronged test: 1) the property must receive a special benefit from the improvement, and 2) the costs of such improvements must be fairly and reasonably apportioned among benefitting properties. Counties typically will establish Municipal Service Benefit Units (MSBU) if special assessments apply to only portions of the county area. The advantages to this approach are that it complies with Florida Statutes as well as it involves an established collection procedure through the local tax collector. Since taxes have the highest priority of payment relative to liens and other claims, the collection rate is significantly high. Offsetting these benefits are the administrative costs of administering the program, developing assessment resolutions, public hearings, and related procedural matters. Statutory early pay discounts of up to 4 percent to property owners are available and need to be built into the assessment calculation so that revenues adequately fund the extension program.

7.3.6 New Septic-to-Sewer Rate Margins

Another funding source from new septic-to-sewer properties is the rate margin. At current rates, the sewer monthly bill is approximately $48, assuming a residential customer using 5,000 gallons. The marginal cost to WRU to serve these customers can be expected to be much lower than this amount. This financial margin could be earmarked to benefit the septic-to-sewer program and support a portion of debt service on septic-to-sewer debt. For example, if the additional operating cost for maintenance and operations for each new septic-to-sewer customer is only $38 per month, then $10 per month of margin would be

available for WRU to support the septic-to-sewer program.[2] Financial Forecast and Funding Strategies

A comprehensive septic-to-sewer financing model was developed assuming County ownership and operation of the Gemini sewer projects. This funding model is to evaluate the financial viability of various sewer expansion segments within the County utility system. The financial model provides for input assumptions and projections in terms of level of self-sufficiency under various scenarios. After reviewing a variety of funding strategies, a 5-year plan has been developed based on achievable funding levels that balance property owner affordability with funding sources that match well with the infrastructure costs.

The sewer expansion plan was viewed from WRU's perspective and from the property owner's viewpoint. The major cost to the homeowner is the property owner assessment of $5,000. The proposed assessment amount may be paid up-front, or the fee may be assessed for up to 20 years at a 2.0-percent interest rate. Assuming the property owner takes advantage of the 4-percent early-pay discount, this equates to $317 per year or approximately $26 per month. The cost to vacant lots would defer to such time that development occurs. The County's existing wastewater development fee of $2,936 per equivalent residential connection (ERC) is assumed to be waived and not be charged to the property owner. WRU is exploring grant opportunities to be able to waive these fees.

7.3.7 Five-Year Improvement Plan

The total cost to develop the sewer collection system for the three PFAs at current costs is approximately $54 million (excluding transmission system costs) over the 5-year planning period. To account for inflation, an annual factor of 2.7 percent is applied to the project costs after Year 1. This factor is based on the 5-year historical average annual increase in the Engineering News-Record (ENR) Construction Cost Index. In addition, a 1.0-percent administrative allowance is included to account for WRU staff time on the PFAs. Table 7-3 provides the 5-year project costs for the septic-to-sewer program.

Table 7-3 Five-Year Inflated Project Costs

Year	Collection System Costs			Administrative Costs	Total Project Costs
	Current Dollars	Inflation	Total		
1	$2,400,000	$0	$2,300,000	$23,000	$2,423,000
2	11,600,000	313,200	11,913,200	119,100	12,032,300
3	16,200,000	886,600	17,086,600	170,900	17,257,500
4	16,000,000	1,331,300	17,331,300	173,300	17,504,600
5	7,800,000	877,100	8,677,100	86,800	8,763,900
Total	**$54,000,000**	**$3,408,200**	**$57,308,200**	**$573,100**	**$57,981,300**

[2] For 5,000 gallons, an incremental cost of $38 equates to $7.60 per 1,000 gallons. This incremental cost allowance would include additional electric for pumping and treatment, maintenance, labor, renewal, and replacement reserves. This allowance for incremental cost is above industry experience and therefore allows for a large contingency.

Table 7-3 shows that the total costs for the three PPAs over the 5-year period, including inflation and an administrative cost allowance, are approximately $58 million. The costs associated with the regional transmission system improvements necessary to connect the septic-to-sewer conversion area to the County's WWTP are assumed to be covered by grants and other utility funding sources.

Multiple funding strategies were reviewed for the 5-year sewer improvement plan. The strategy aims to assign just, equitable, and affordable costs to property owners and find an achievable level of outside funding while having no adverse effect on existing WRU ratepayers. The sources of outside funding proposed in the plan include SRF low-interest loans and grants. The proposed plan assumes that grants and/or legislative appropriations will cover 75 percent of the project costs. The remaining amount not funded from grants is funded through SRF loan proceeds administered by FDEP. The SRF loan program would be advantageous to WRU because of the low interest rates currently offered and the program being firmly established in Florida for utilities infrastructure improvements. Table 7-4 summarizes the annual project costs and funding sources for the 5-year sewer improvement plan:

Table 7-4 Five-Year Funding Summary

Description[1]	Year 1	Year 2	Year 3	Year 4	Year 5	Years 1-5 Total
Project Costs	$2.4 M	$12.0 M	$17.3 M	$17.5 M	$8.8 M	$58.0 M
Funding Sources						
Grants	$1.8 M	$9.0 M	$12.9 M	$13.1 M	$6.6 M	$43.5 M
SRF Loan Project Funds	$0.6 M	$3.0 M	$4.3 M	$4.4 M	$2.2 M	$14.5 M
Total	**$2.4 M**	**$12.0 M**	**$17.3 M**	**$17.5 M**	**$8.8 M**	**$58.0 M**

[1] All amounts shown in millions.

Table 7-4 shows that a portion of the project costs are expected to be funded through two SRF loans assumed to be issued by Volusia County.[3] The total new debt borrowed over the 5-year period for the sewer improvement plan is approximately $15 million. Table 7-5 provides the assumptions used for the SRF loan issuances. Each loan covers the remaining project costs (after grants) for a 3-year period.

[3] SRF loans are shown since they are low interest cost; other financing mechanisms such as revenue bonds, Water Infrastructure Finance and Innovation Act, etc. could be substituted for SRF loans with certain adjustments to assumptions regarding interest rates, duration, debt structure, etc. The SRF loan issuances are designed to illustrate the relative timing and sizing of debt.

Table 7-5 Five-Year SRF Loan Issuances

Description	SRF Loan 1 (Years 1 to 3)	SRF Loan 2 (Years 4 to 5)
Construction Reimbursement	$7,903,800	$6,567,500
Loan Costs [1]	162,800	133,900
Capitalized Interest [2]	234,900	127,400
Total Loan Amount	**$8,301,500**	**$6,828,800**
Term (years)	20	20
Interest Rate	2.00%	2.00%
Annual Debt Service	$505,700	$416,000

[1] Loan issuance costs assumed at 2.0 percent of project costs.

[2] SRF Loan 1 reflects 3 years of capitalized interest and SRF Loan 2 reflects 2 years of capitalized interest.

The annual debt service associated with the projected SRF loans is assumed to be repaid through a combination of the financial margin generated from new septic-to-sewer customers and the proposed assessment on septic-to-sewer properties. As discussed above, $10 per month of margin would be available for WRU to support the septic-to-sewer program. In addition, the financial model assumes a non-ad valorem assessment of $5,000 per single-family property. Table 7-6 and Table 7-7 provide the net cash flows to WRU associated with this analysis, considering the annual debt service and revenues generated to support the debt service.

Table 7-6 Years 1 through 10 Cash Flow and Debt Service Coverage

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assessment Revenue	$0	$73,500	$290,900	$477,900	$719,000	$719,000	$719,000	$719,000	$719,000	$719,000
Rate Margin	0	0	28,100	109,100	176,900	262,000	262,000	262,000	262,000	262,000
Total Revenue Available for Debt Repayment	$0	$73,500	$319,000	$587,000	$895,900	$981,000	$981,000	$981,000	$981,000	$981,000
SRF Debt Service Payments	$0	$0	$0	$505,700	$505,700	$921,700	$921,700	$921,700	$921,700	$921,700
Surplus/(Deficiency)	$0	$73,500	$319,000	$81,300	$390,200	$59,300	$59,300	$59,300	$59,300	$59,300
Debt Service Coverage	N/A	N/A	N/A	1.16	1.77	1.06	1.06	1.06	1.06	1.06
Available Reserves	$0	$73,500	$392,500	$473,800	$864,000	$923,300	$982,600	$1,041,900	$1,101,200	$1,160,500

Table 7-7 Years 11 through 20 Cash Flow and Debt Service Coverage

Description	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Assessment Revenue	$719,000	$719,000	$719,000	$719,000	$719,000	$719,000	$719,000	$719,000	$719,000	$719,000
Rate Margin	262,000	262,000	262,000	262,000	262,000	262,000	262,000	262,000	262,000	262,000
Total Revenue Available for Debt Repayment	$981,000	$981,000	$981,000	$981,000	$981,000	$981,000	$981,000	$981,000	$981,000	$981,000
SRF Debt Service Payments	$921,700	$921,700	$921,700	$921,700	$921,700	$921,700	$921,700	$921,700	$921,700	$921,700
Surplus/ (Deficiency)	$59,300	$59,300	$59,300	$59,300	$59,300	$59,300	$59,300	$59,300	$59,300	$59,300
Debt Service Coverage	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Available Reserves	$1,219,800	$1,279,100	$1,338,400	$1,397,700	$1,457,000	$1,516,300	$1,575,600	$1,634,900	$1,694,200	$1,753,500

The financial forecast is based on the following wastewater availability schedule assuming mandatory connections with associated assessments and monthly wastewater charges:

Table 7-8 Five-Year Central Sewer Conversions

Year	New Connections[1]	Cumulative Connections
1	0	0
2	234	234
3	675	909
4	565	1,474
5	709	2,183

[1] Analysis assumes new connections begin paying monthly wastewater charges 1 year after connection (i.e., Year 2 connections pay the monthly wastewater charges in Year 3).

Appendix A

Public Education Plan Materials

Gemini & DeLeon Springs Wastewater Feasibility Analyses

Workshop #2
June 25, 2019

Volusia County
FLORIDA

JonesEdmunds

State Goals for Our Water

- What is a TMDL (Total Maximum Daily Load)?
  - Establishes maximum amount of a pollutant that a water body can receive without causing exceedances of water quality standards
- TMDLs are established for waters that fail to meet water quality standards and characterize how much of each pollutant the water body can assimilate without violating those standards
- Basin Management Action Plans (BMAPs) are the roadmaps of projects for improving water quality
- Stakeholders in the process include…
  - Regulatory Agencies (FDEP, SWFWMD, FDOH)
  - Local Government (County and Cities)
  - Business and Industry
  - Agriculture
  - And You!

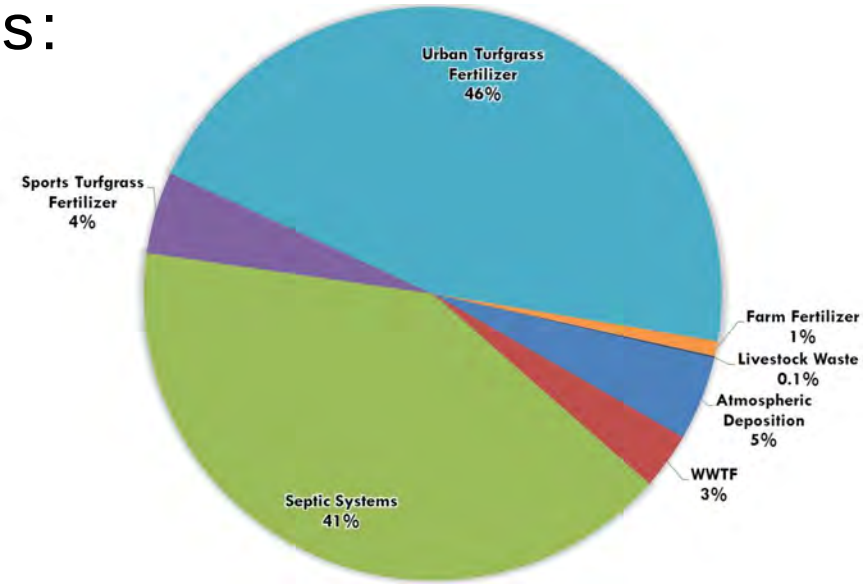
Florida Springs and Aquifer Protection Act

- Requirements of Senate Bill 552
  - TMDL must be established for first magnitude springs by December 2018
  - Priority Focus Areas must be established for all first magnitude springs
  - OSTDS Remediation Plan required for areas where septic systems have greater than 20% contribution (or as FDEP deems appropriate)

Gemini Springs

- Final TMDL prepared June 2017
- Water quality impacts were found
- BMAP finalized June 2018
- PFA established
- OSTDS Remediation Plan required

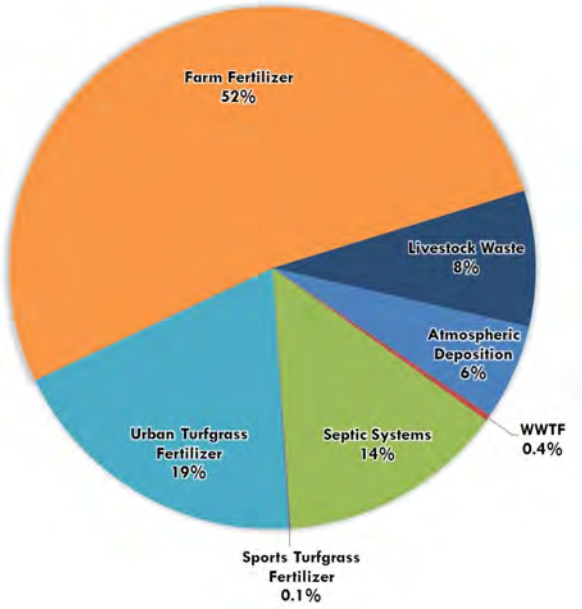
- Major Nitrogen contributors:
  - Septic tanks
  - Urban turf grass fertilizer



Deleon Springs

- Final TMDL prepared June 2017
- Water quality impacts were found
- BMAP finalized June 2018
- PFA established
- OSTDS Remediation Plan required

- Major Nitrogen contributors:
  - Farm fertilizer
  - Septic tanks
  - Urban turf grass fertilizer



OSTDS Elements

- An evaluation of credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and spring systems.
- Options for repair, upgrade, replacement, drain field modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action.
- A public education plan to provide area residents with reliable, understandable information about OSTDS and springs.
- Cost-effective and financially feasible projects necessary to reduce the nutrient impacts from OSTDS.
- A priority ranking for each project for funding contingent on appropriations in the General Appropriations Act.

Project Scope Overview

- Scope Closely Matches Grant Requirements
  - Inventory Existing OSTDS and Wastewater Infrastructure in BMAP and PFA
  - Project Wastewater Flows and Nutrient Loads (20-Yr Planning Period)
  - Develop, Assess, and Prioritize Projects
    - Document Needed Wastewater Infrastructure to Meet BMAP Remediation Requirements for next 20 Years
    - Identify OSTDS that will be:
      - Eliminated and Connected to Centralized Sewer
      - Modified with Enhanced Nitrogen Removal Features
      - Not Expected to be Eliminated or Upgraded

Project Scope Overview

- Prioritize Projects
  - Proposed Implementation Timeline
  - Project Costs Opinions
- Hold Public Meetings
  - Discuss Proposed Projects
  - Discuss Capital Costs and Potential Financial Impacts
- Feasibility Analysis Report
- Presentation of Results to County Council

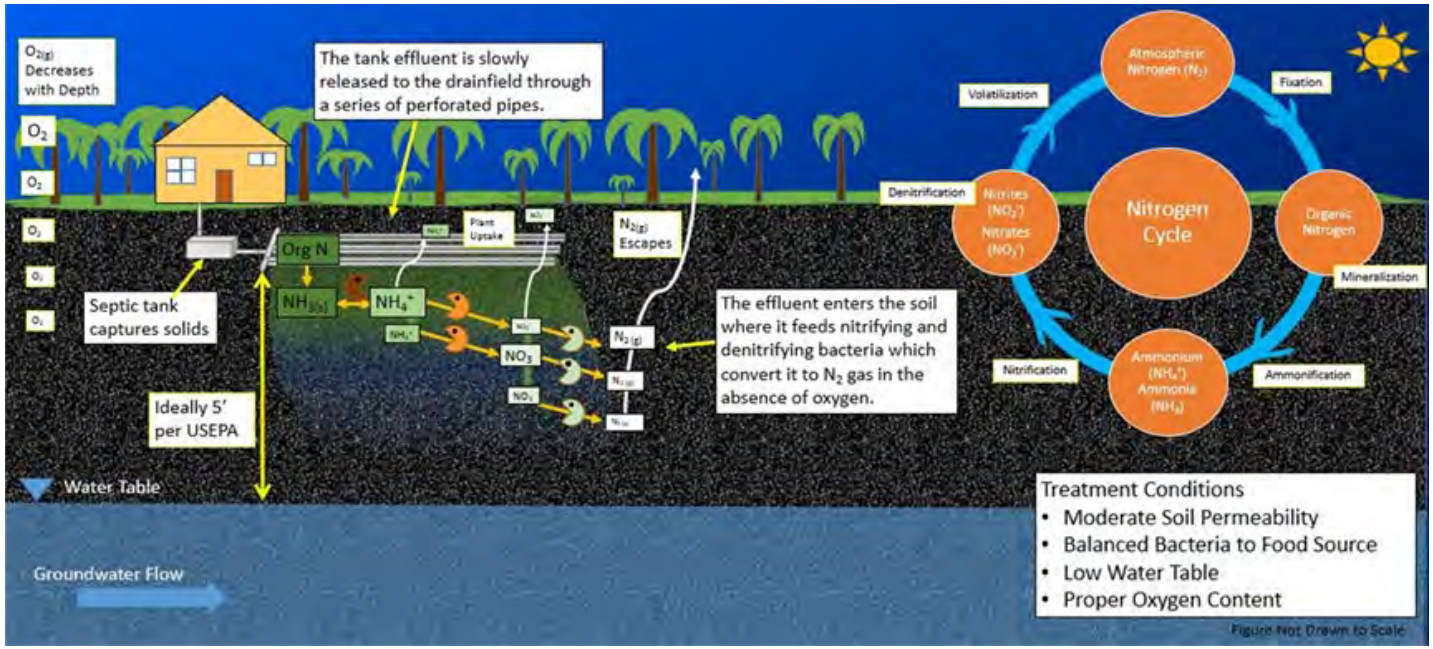
Project Status

- Completed Chapters 1, 2, & 3
- Starting on Population and Flow Projections (Task 4)

Needs and Next Steps

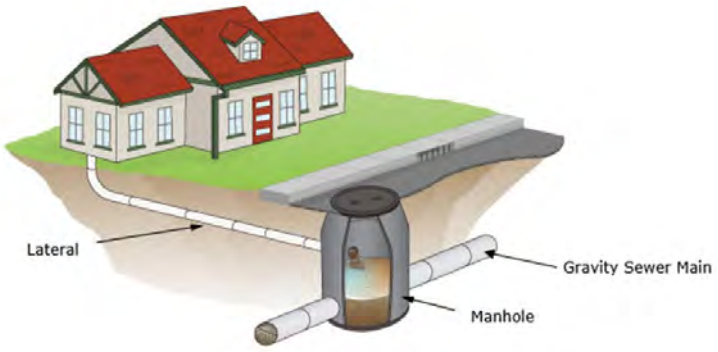
- Who are community influencers?
- Public meetings (start late Summer)

- Interest Cards
  - Gauge level on interest, financial tolerance, animosity
  - Where to send



Working Together

- List of projects that you may be doing (stormwater, road, utilities, etc.)
- List of influencers who would appreciate us reaching out to them
- Types of work that you believe would be accepted or not
- Target neighborhoods



Tentative Project Schedule

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Questions?

Mr. Mike Ulrich
Director, Water Resources and Utilities
123 West Indiana Avenue
DeLand, FL 32720
(386) 943-7027
mulrich@co.volusia.fl.us

Jamie Bell, PE
Jones Edmunds
(352) 377-5821
JSBell@jonesedmunds.com

Volusia County FLORIDA

JonesEdmunds
Integrity • Knowledge • Service

ATTENDEE SIGN-IN SHEET

PURPOSE OF MEETING: Workshop #2 Stakeholder Outreach – City of DeBary Engineering, Growth Planning, and Econ. Dev. DATE: June 25, 2019

LOCATION OF MEETING: County Administrative Building, 123 West Indiana Ave, DeLand, FL 32720 TIME: 2:00 PM

PROJECT NAME: Gemini & DeLeon Springs Feasibility Analyses

NAME AND TITLE (PLEASE PRINT)	COMPANY AND ADDRESS	PHONE NUMBER AND EMAIL
John Horvath	Jones Edmunds	PHONE: 352-377-5821 EMAIL: jhorvath@jonesedmunds.com
Karen Chasez	DeBary Mayor	PHONE: KChasez@debary.org EMAIL: 630-309-8895
DAVID HAWSTAD	DEBARY CITY ENGINEER	PHONE: 407-997-9140 EMAIL: DAVIDepBGADSJXSBLQILLEBAVQ.WF
Alan Williamson	DeBary Public Works	PHONE: (386) 804-1778 EMAIL: awilliamson@debary.org
CARMEN ROSAMANDA	City of DeBary	PHONE: 386-601-0218 EMAIL: CROSAmanda@DeBay.org
RS Dyett	Volusia County	PHONE: 386-822-6465 EMAIL: rdyett@volusia.org
TOD/Economic Roger VanAuken	DeBary	PHONE: 386-601-0221 EMAIL: rvanauken@debary.org
Matt Boerger	DeBary	PHONE: EMAIL: mboerger@debary.org
Tom CAREY	Volusia County	PHONE: EMAIL: tcarey@volusia.org

NAME AND TITLE (PLEASE PRINT)	COMPANY AND ADDRESS	PHONE NUMBER AND EMAIL
Ginger		PHONE EMAIL
Terri Lowery		PHONE EMAIL
Brian Icerman		PHONE EMAIL
Jamie Bell		PHONE EMAIL
Mark Nelson		PHONE EMAIL
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		PHONE EMAIL

WORKSHOP #2 MEETING MINUTES
Meeting with City of DeBary Engineering, Growth Planning, and Economic Development

PROJECT NO.:	PC2498 (County) 22015-019-01 (Jones Edmunds) FDEP Grant No. LP64061
PROJECT NAME:	Gemini & DeLeon Springs Feasibility Analyses
MEETING DATE:	June 25, 2019
PARTICIPANTS:	See Sign-in Sheet

1. Introductions

2. Background
   a. 2016 Springs Legislation
   b. OSTDS Remediation Plan
   c. 9 County Grants Awarded by FDEP
      i. County-Lead Process w/ input from Cities within BMAP Boundary
   d. Goals
      i. Develop community support and engagement
      ii. Develop or identify feasible projects to meet remediation goals

3. Project Scope
   a. Scope vs. Grant
   b. Current Project Status
   c. Needs and next steps
      i. Need stakeholder input on potential projects
      ii. Who are community influencers?
      iii. Public meetings (start late Summer)
         1. Where? There will be 1 in DeLeon, 2 in DeBary
         2. When? August/September timeframe
         3. Local optics will be based on where we are in the process
      iv. Interest Cards
         1. Gauge level on interest, financial tolerance, animosity
         2. Where to send
            a. Entire PFA at least

General Comments

Will also host 2 public workshops

One with City, one with County

City will vet report first, then County

Feasibility involves engineering, financial, and FDEP considerations

Commitment to FDEP – 1200 homes off septic

Even if your system never fails, in the PFA you will need to upgrade by the 20-year mark

Will requirements change after we do projects? BMAP reevaluated every 5 years

Mayor – public feedback needs to be acknowledged up front

Urban fertilizer vs septic contribution → flipped in the PFA

How do we change this narrative?

Note – County credits are available for fertilizer reductions

FL Yards – IFAS program – County and City can partner

We need to manage expectations throughout this process

Cows were on land adjacent to the Spring until the last year or two

City put out a newsletter recently that included info on septic systems and septic programs

Mayor – 1st implementation needs to be as smooth as possible

Take route with fewest barriers, existing infrastructure

Even if it's not the most cost effective it might be the easiest to do

Propose education area of Volusia/DeBary websites

4. Working Together
   a. List of projects that you may be doing (stormwater, road, utilities, etc.)
      i. 1st area to focus on – between 17/92, South Shell, and the commercial cross street
      ii. 2nd area – the Vistas, Dirksen
         Could be a partnership with Deltona
         Dirksen is being expanded, need to coordinate with transportation
      iii. Adams = TOD area
      iv. New development – Rivington, River Bend
      v. Area(s) of interest
         1. Older than 1990
         2. Possibly transient community? Seasonal?
      vi. JE will provide a list of funding options, Septic to Sewer Guidance document
   b. List of influencers who would appreciate us reaching out to them.
      i. Suggestions - JE can provide info for the City to have these prelim conversations
         1. Howard Gates (Wharton Smith?)
            a. Pushes water issues (positive)
            b. In favor of septic to sewer but doesn't believe the #'s
         2. William Sell (anti-1/2 cent sales tax guy)
            a. Posts anti-septic stuff on social media (big negative)
            b. Going to be the most anti-project person
         3. Council member – maybe, maybe not helpful
            a. DeBary bayou dredge? Gemini Springs?
         4. Mrs. Grey – Gemini Springs Alliance (maybe, some hesitation)
            a. She may conflate this with the I-4 issue…
         5. Recommend a public meeting and some education first, then comment cards

ii. Centralized document repository

c. Types of work that you believe would be accepted or not
d. Target neighborhoods
    i. What do we do about the west side of Shell Road?
        1. Not picking this area b/c of looping for drinking water WQ
        2. This helps justify money request to legislature
    ii. What is the benefit to the homeowner?
        1. Improve WQ? Well water vs City/County water?
        2. Property values increase? (Stay away from this if we can't prove it)
        3. **If you can't prove it, don't say it** - want statistical justification
        4. *Can* talk about insurance savings
        5. Benefit – keep your old well for landscaping, etc.
    iii. Not forcing water hookups, just making water available
    iv. We need to focus on the requirements of the Fl Sprigs and Aq Protection Act
e. Final note – what is the cost of doing nothing? That may be the worst option of them all.

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6. Open Discussion

Wastewater Feasibility Study for the Protection of Gemini Springs
INFORMATIONAL SESSION

January 27, 2021

WHY IS GEMINI SPRINGS IMPORTANT?

- Approximately 6.5 million gallons of water bubble up from the two springs each day in the 212-acre Gemini Springs Park.
- The second magnitude spring consists of two spring vents approximately 150 feet apart in the City of DeBary.
- Gemini Springs is one of more than 1,000 springs throughout Florida and one of 30 Outstanding Florida Springs as established in 2016 by the Florida Legislature.
- In 2016, the Florida Legislature identified Gemini Springs as an impaired second magnitude “Outstanding Florida Spring” that requires additional protections to ensure conservation and restoration for future generations.

STATE GOALS FOR OUR WATER

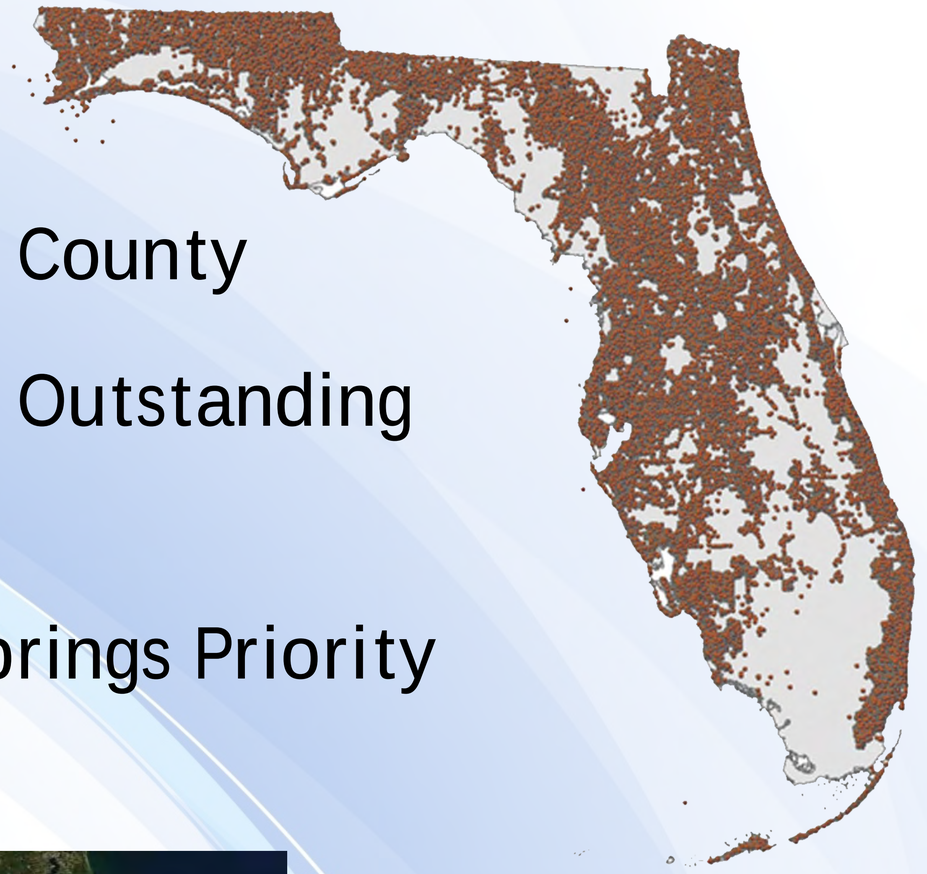
- State water quality goals are guided by the **Federal Clean Water Act**.
- The **Florida Department of Environmental Protection (FDEP)** is the agency responsible for implementing protections.
- A **Total Maximum Daily Load (TMDL)** establishes the maximum amount of a pollutant a water body can receive without exceeding water quality standards.
- **Basin Management Action Plans (BMAPs)** are used as roadmaps of projects for improving water quality based on the TMDL.

FLORIDA SPRINGS AND AQUIFER PROTECTION ACT

- Passed by State Legislature in 2016
- Requirements of the Act
  - TMDLs must be established for first magnitude springs by December 2018
  - Priority Focus Areas (PFAs) are the *area* where a *spring* is likely to be most adversely impacted by activities established for Outstanding Florida Springs

  - Onsite Sewage Treatment and Disposal Systems (OSTDS) Remediation Plan required for areas where septic systems have greater than 20% contribution to the nutrient load in the Priority Focus Area
- OSTDS/Septic systems were determined to contribute more than 40% of the nutrient load to Gemini Springs

FLORIDA SEPTIC SYSTEMS BY THE NUMBERS



- More than 2.1 million in Florida
- More than 90,000 septic systems in Volusia County
- More than 50,000 septic systems in Volusia Outstanding Florida Springs BMAP boundaries
- Over 2,000 septic systems in the Gemini Springs Priority Focus Area

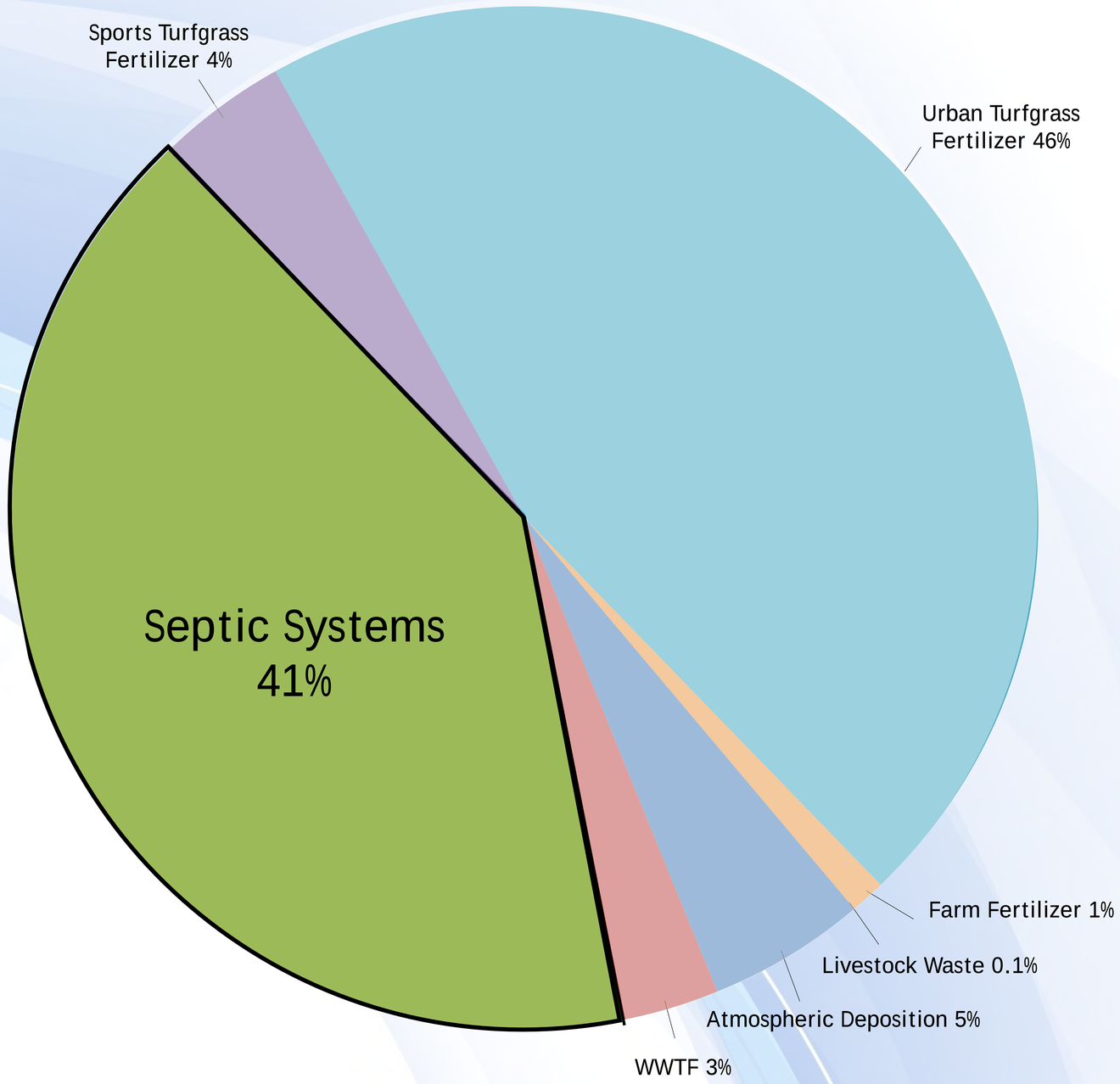
Photo credit: Amy K. Munizzi

Photo Credit: Paul Clark

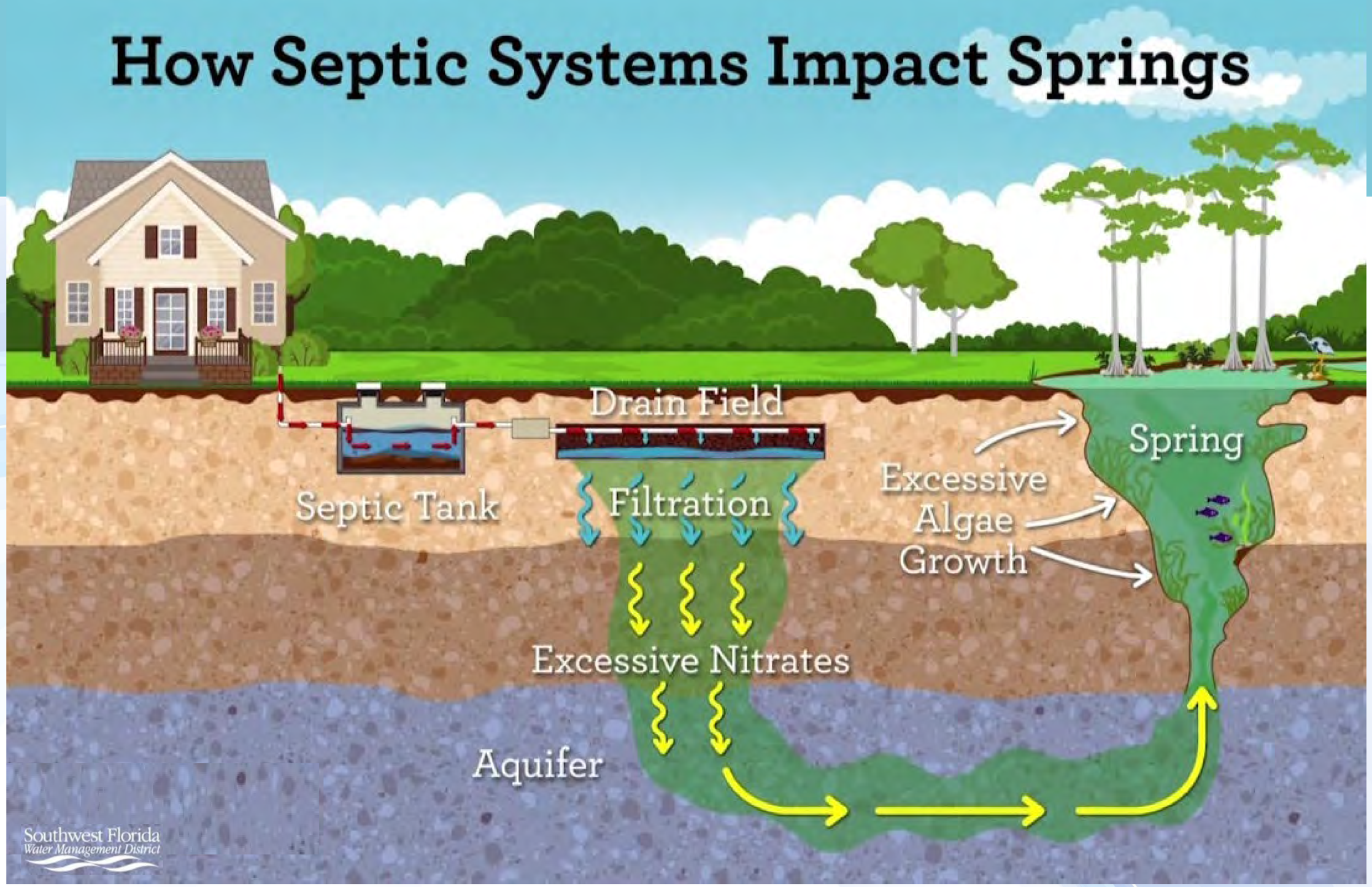
World History Archive/Alamy Stock Photo

GEMINI SPRINGS TMDL AND BMAP

- Final TMDL adopted 2017
- Water quality impacts were identified
- BMAP finalized June 2018
- Total Current Load 20,496 lbs-N/year
- 14,270 lbs-N/year reduction required
- Major Nitrogen contributors:
  - Urban Turfgrass
  - Septic Systems

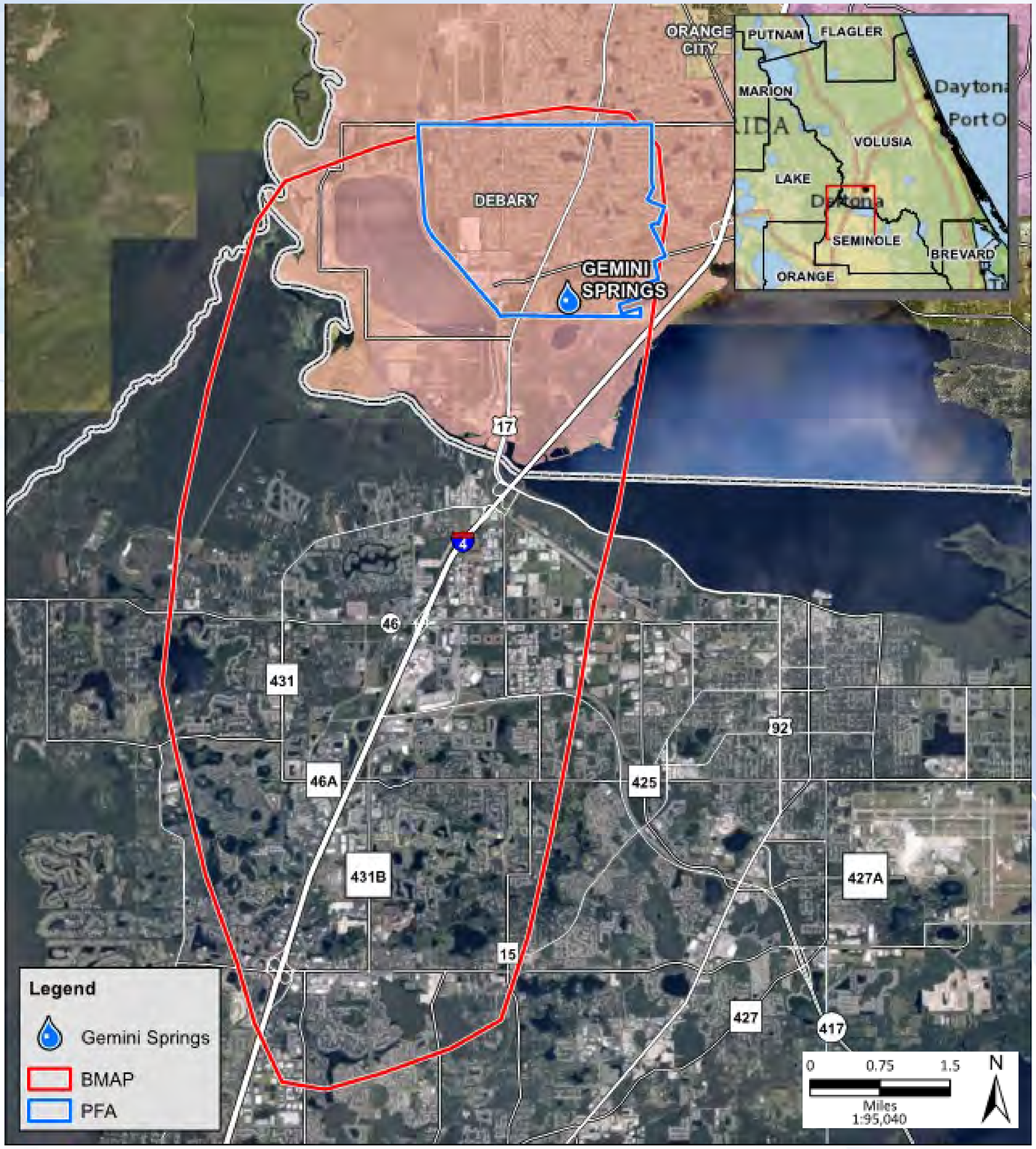


Nitrogen Loading in the Gemini Springs BMAP Area per FDEP's Gemini Springs BMAP (2018)

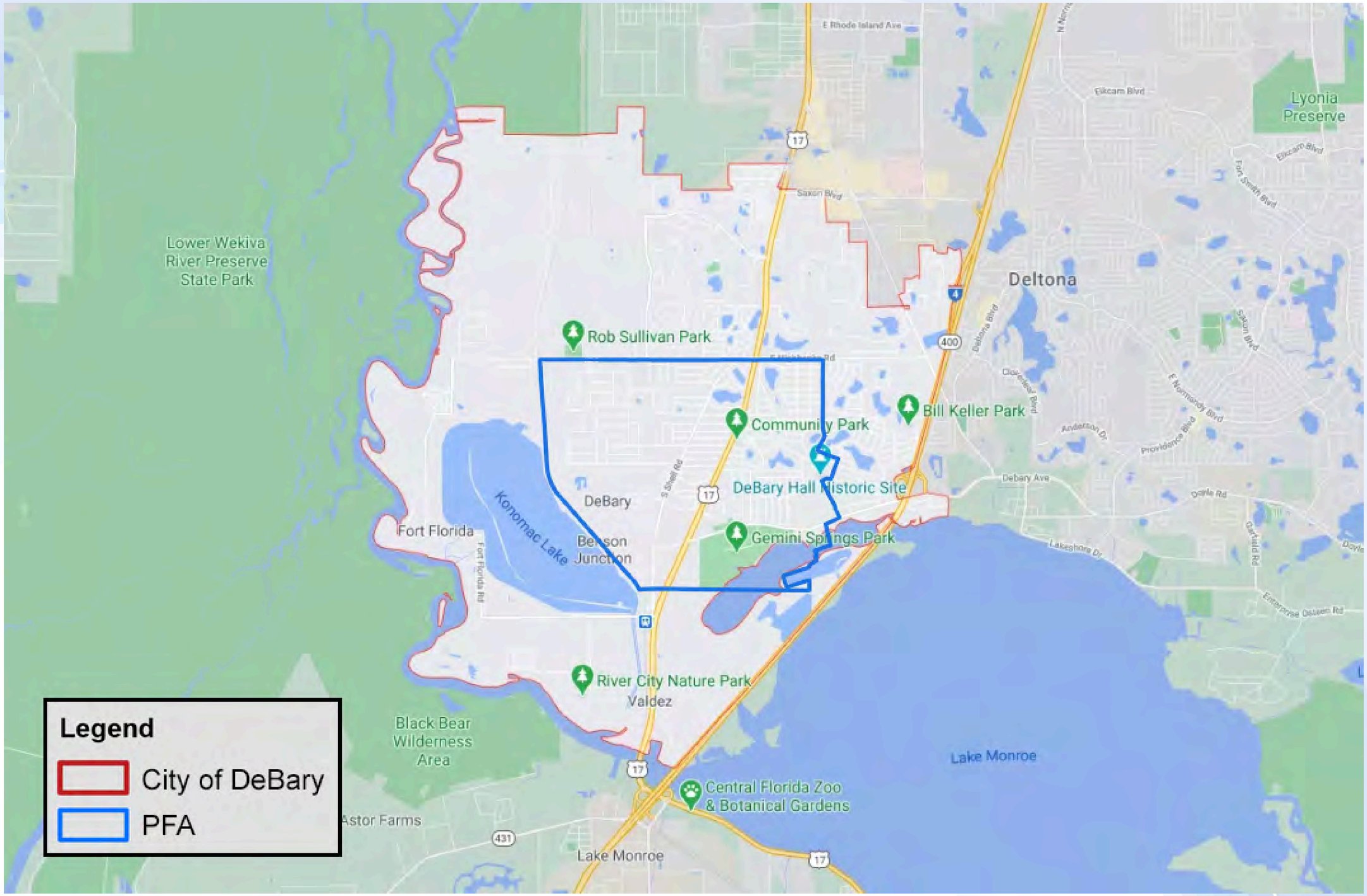


- Conventional septic systems are designed to protect human health, not to remove nutrient pollution.
- Septic systems on average contribute a load of 8.2 lbs-N/year per system to the springs.
- Septic systems work by slowly releasing wastewater through a drainfield, or soil absorption field.
- With over 2,000 septic systems currently in use in the Gemini Springs PFA, the nitrogen is polluting our springs and leaching into our groundwater - our drinking water source.

GEMINI SPRINGS REQUIRED REMEDIATION AREA



GEMINI SPRINGS PFA ENTIRELY WITHIN THE CITY OF DEBARY



WHAT IS AN OSTDS REMEDIATION PLAN?

A Plan to Reduce the Nutrient Load Coming from Septic Systems

- An **evaluation** of credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and spring systems.

- **Options** for repair, upgrade, replacement, drain modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action.

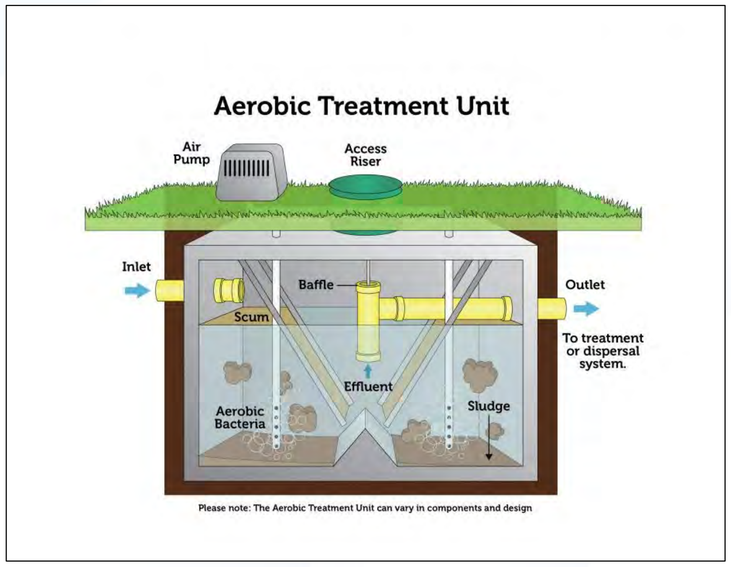
- A **public education plan** to provide area residents with reliable, understandable information about OSTDS (a.k.a. septic systems) and springs.

- **Cost-effective** and financially feasible **projects** necessary to reduce the nutrient impacts from OSTDS.

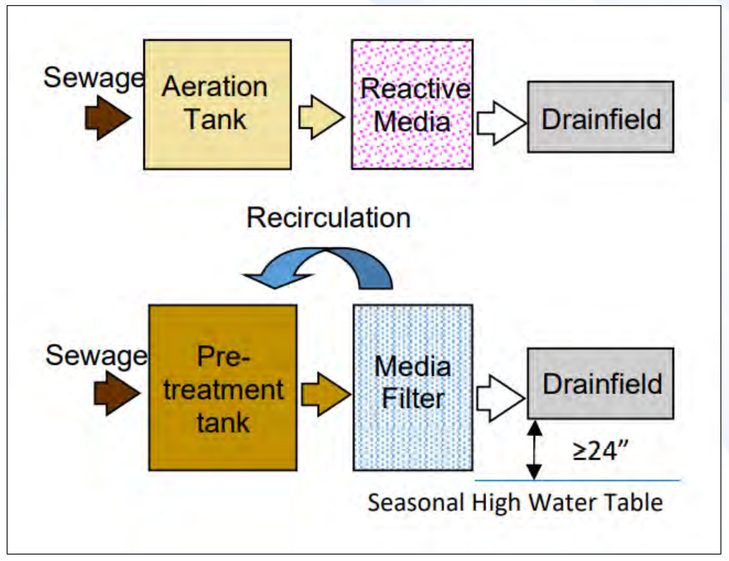
- A **priority ranking** for each project for funding contingent on appropriations in the General Appropriations Act.

DECENTRALIZED APPROACH

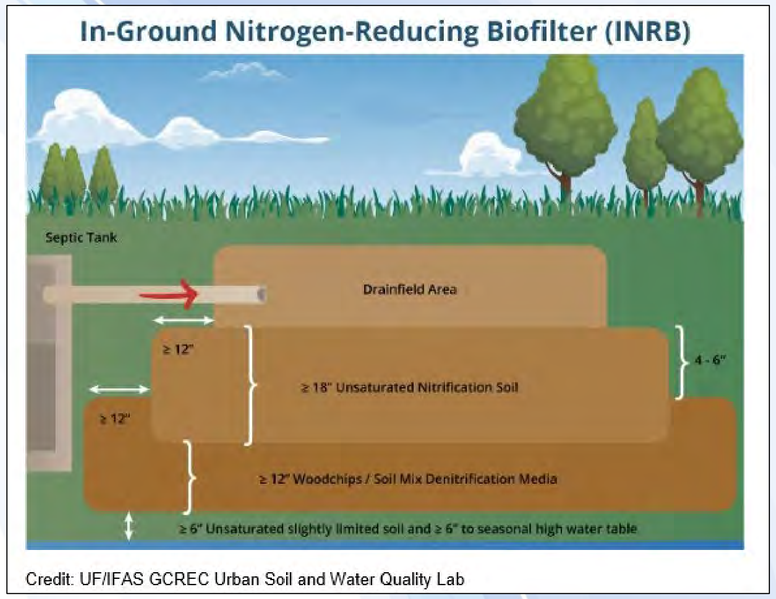
- Conventional septic systems cannot be used for lots less than one acre in the PFA for new homes or businesses with new septic systems and for existing systems when replacement is required unless sewer will be available within five years.
- Advanced Treatment Alternatives
  - Aerobic Treatment Units
  - Performance-Based Treatment System
  - In-Ground Nitrogen Reducing Biofilter (INRB)



Aerobic Treatment Units



Performance-Based Treatment Units



Credit: UF/IFAS GCREC Urban Soil and Water Quality Lab

DECENTRALIZED APPROACH

System Type	System Description	Considerations	Lifecycle Costs (40-Years)
Aerobic Treatment Units	• Systems typically consist of a pump, pipes, and diffusers and include a process to promote biological denitrification.	• Requires electrical connection. • Requires a maintenance contract and operating permit from the county health department.	Installation - $12,500-$17,500 Annual - $1,000-$1,500 (includes required inspections, electricity, routine pump out and anticipated system maintenance)
Performance-based Treatment Units	• Vary widely but include nitrogen-reducing aerobic treatment units and other components.	• Must be engineer-designed and permitted. • Require a maintenance contract and operating permit from the county health department.	Installation - $15,000-$20,000 Annual - $1,000-$1,500 (includes required inspections, electricity, routine pump out and anticipated system maintenance)
In-Ground Nitrogen Reducing Biofilter	• Modifies an OSTDS drainfield with layers of soil specially designed to promote natural N cycling processes that convert NO_3^- to an N gas that is lost to the atmosphere, thus removing N from the soil and groundwater.	• Research is ongoing, early estimates are that the soil media in an INRB can function for 20+ years before they need to be replaced or replenished • Significant Land requirements make challenging for small lots.	Installation - $10,000-$12,500 Annual - $250-$500 2nd Installation approx. year 20

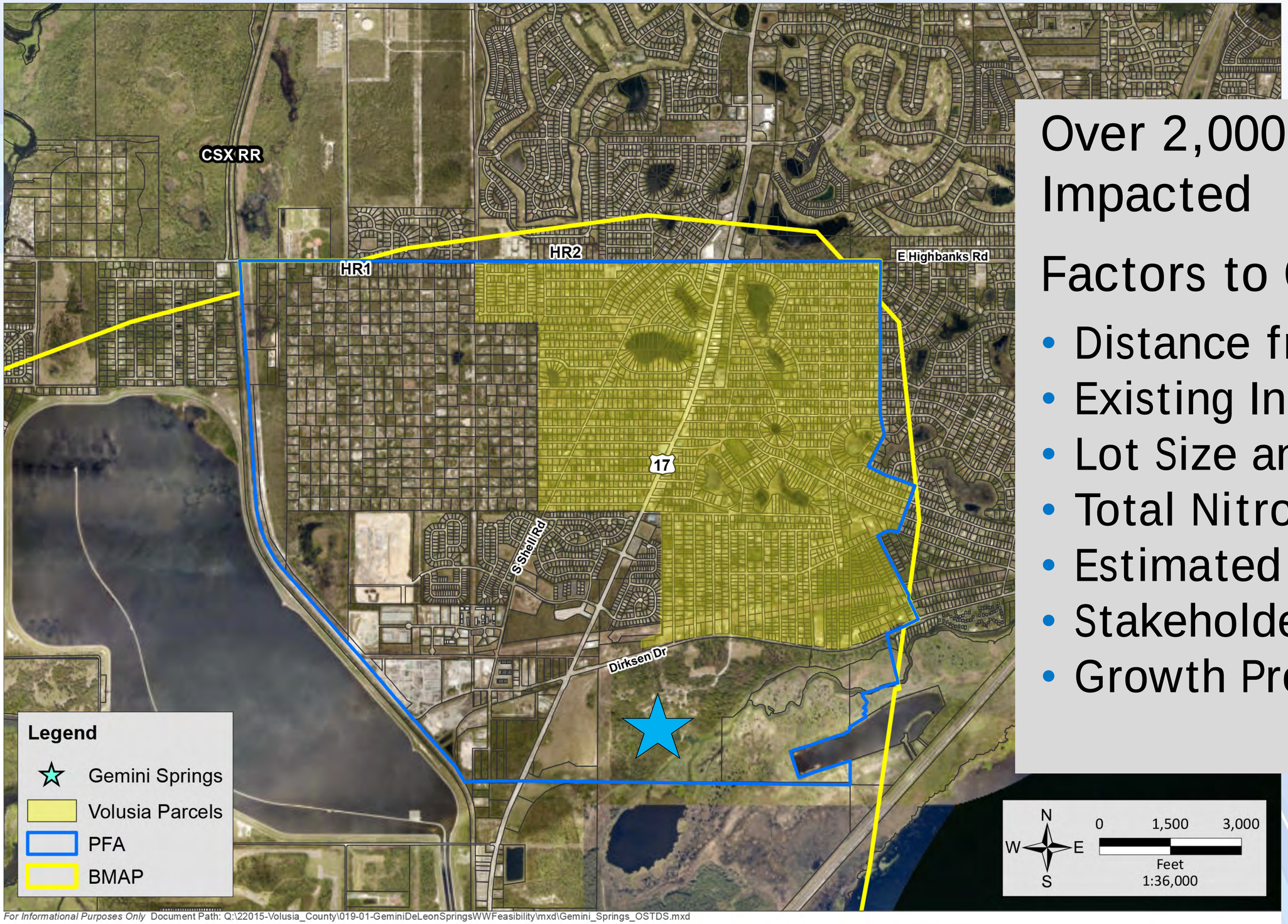
- Nitrogen reduction of up to approx. 5.3 lbs-N/yr/OSTDS removed.
- Estimated reduction of up to approx. 10,600 lbs-N/yr if all OSTDS on <1.0-acre parcels are upgraded in a decentralized approach

CENTRALIZED APPROACH

System Type	System Description	Considerations	Lifecycle Costs (40-Years)
Gravity Sewer Systems	•Involves gravity service laterals that connect to gravity sewer mains and then flows to localized lift stations. This system of lift stations pump into force mains used to transport the wastewater to a WWTF for treatment	-typically results in a greater disturbance to the residents -generally more reliable and less maintenance-intensive than other types of systems -service laterals are generally the customers' responsibility to maintain on their property	Installation - $30,000-$40,000 Annual - $400-$600
Vacuum Sewer Systems	•Includes a valve pit serving several customers, a vacuum collection system, and a vacuum collection station. Sewage flows by gravity from the homes/structures into a valve pit with pneumatic valve that operate by pressure (no electrical power is required). The valve pit pneumatic valve opens automatically when a given quantity of sewage accumulates in the valve pit.	-Disturbance to developed land resulting from construction is typically less than the disturbance from constructing a gravity collection system. -very little inflow and infiltration (I&I) occurs compared to gravity systems. -requires more O&M for the Utility than a gravity system since the pneumatic valve pits need to be inspected & maintained.	Installation - $17,500-$22,500 Annual - $400-$600
Low Pressure/ Grinder Pump Systems	•Uses a grinder pump station for each customer, installed on each customer's property or in ROW. Includes automatic pumps and control devices to convey the wastewater into a low-pressure collection system.	-low-pressure systems capital costs are generally lower than gravity or vacuum systems, operation and maintenance (O&M) costs are generally higher. -customers may be required to maintain the septic effluent pump, or provide an easement dedicated to the local government/utility to allow access onto the property to maintain the system.	Installation - $12,500-$17,500 Annual - $800-$1,000 Annual costs assume homeowner maintains the grinder pump.

- Nitrogen reduction of approx. 8.2 lbs-N/yr/OSTDS removed.
- Converting approx. 1,750 septic tanks to centralized sewer achieves the required nitrogen reduction.

CRITERIA USED TO ASSESS POTENTIAL PROJECT AREAS



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Over 2,000 Parcels Impacted

Factors to Consider

- Distance from Spring
- Existing Infrastructure
- Lot Size and Density
- Total Nitrogen Load
- Estimated Cost
- Stakeholder Input
- Growth Projections

BMAP TIMELINE

- BMAP implementation is intended to be a 20-year process with defined nitrogen reduction cumulative milestones.
  - 5-year - 30%
  - 10- year - 80%
  - 15-year - 100%
- TMDL will be met no later than the 20-year goal with a total reduction requirement of 14,270 lbs-N/year

Nitrogen Removal 2018 – 2023	Nitrogen Removal 2023 – 2028	Nitrogen Removal 2028 – 2033	Total Nitrogen Removal by 2038
4,281 lbs	7,135 lbs	2,854 lbs	14,270 lbs

NEXT STEPS?

- **Obtain** feedback from the City
- **Hold** public meeting to present information to residents
- **Evaluate** information received from public outreach
- **Receive** feedback from FDEP on proposed plan and address regulatory needs
- **Continue** City and County investment in nutrient reduction projects
- **Pursue** grant dollars to offset financial impacts to City and County residents

QUESTIONS OR COMMENTS

If you have questions or comments, please call or email

Erin Reed, PhD, PE
Water & Utilities Engineer
Volusia County Water Resources and Utilities
Office: 386.943.7027 ext. 13642
erinreed@volusia.org

Welcome

Wastewater Feasibility Study for the Protection of Gemini Springs

INFORMATIONAL SESSION

February 24, 2021

For Informational Purposes Only Document Path: Q:\22015-Volusia_County\019-01-GeminiDeLeonSpringsWWFeasibility\mxd\Gemini_Springs_OSTDS.mxd

Wastewater Feasibility Study for the Protection of Gemini Springs
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February 24, 2021

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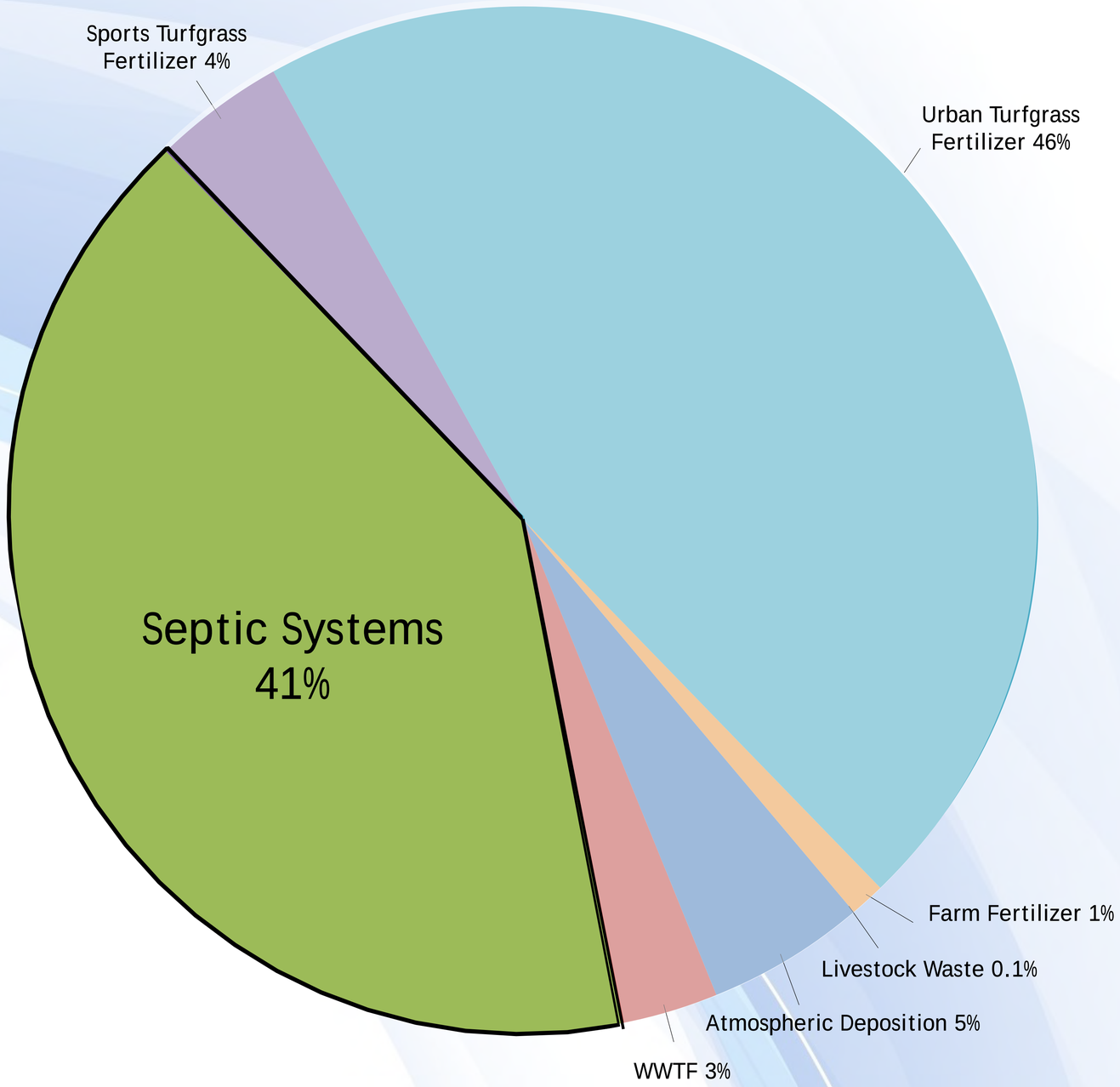
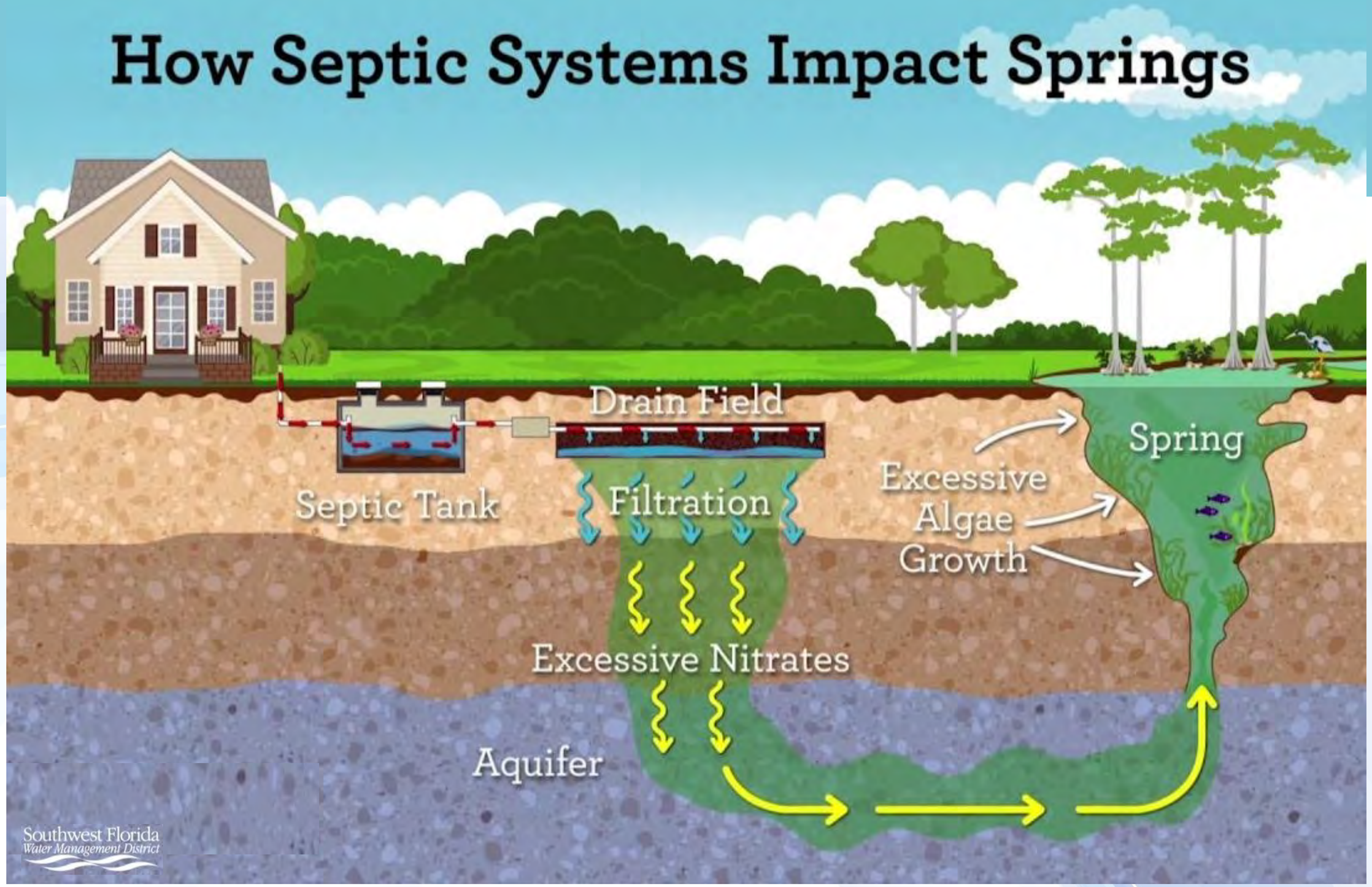
  - Urban Turfgrass
  - Septic Systems

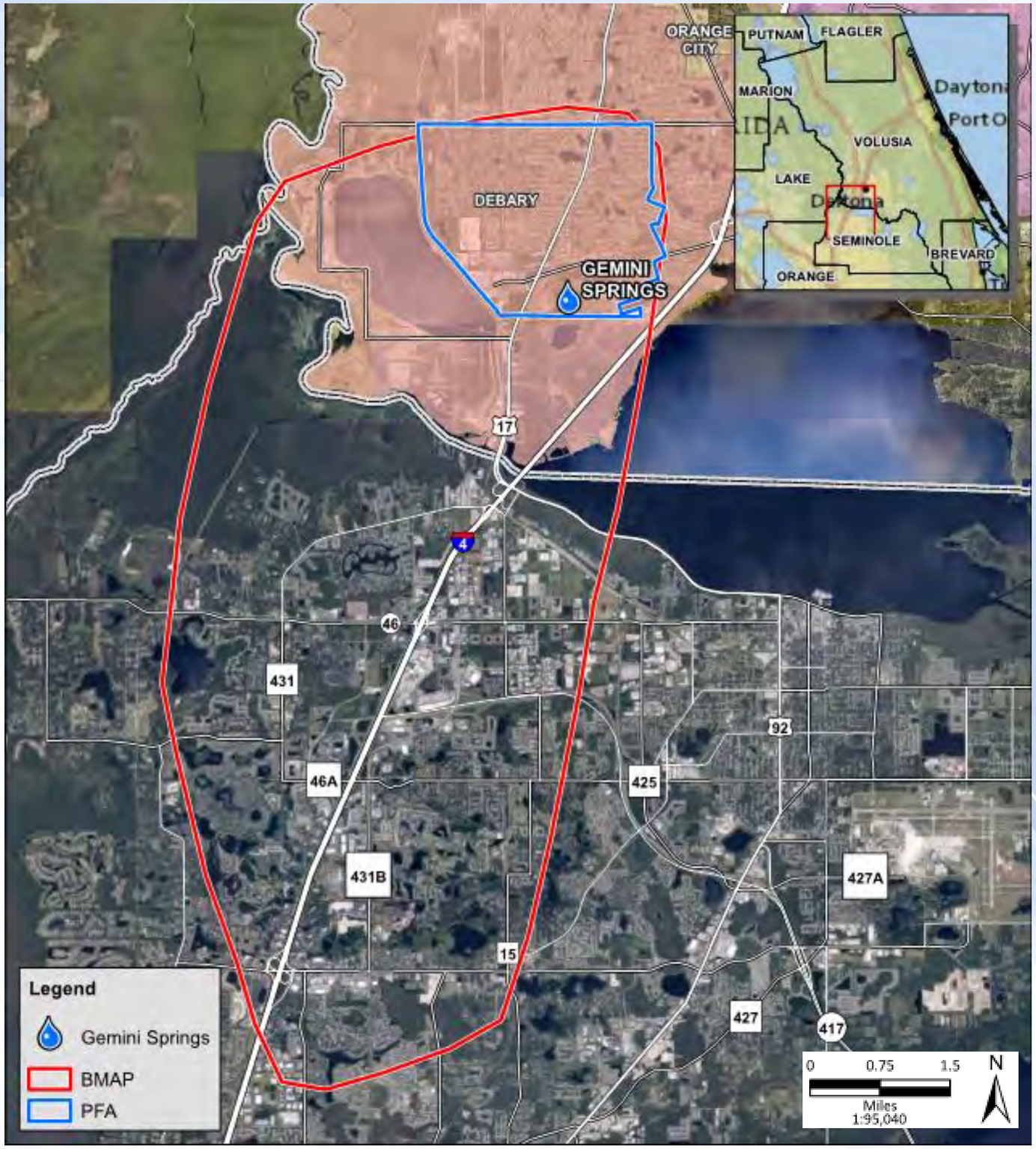


Nitrogen Loading in the Gemini Springs BMAP Area per FDEP's Gemini Springs BMAP (2018)

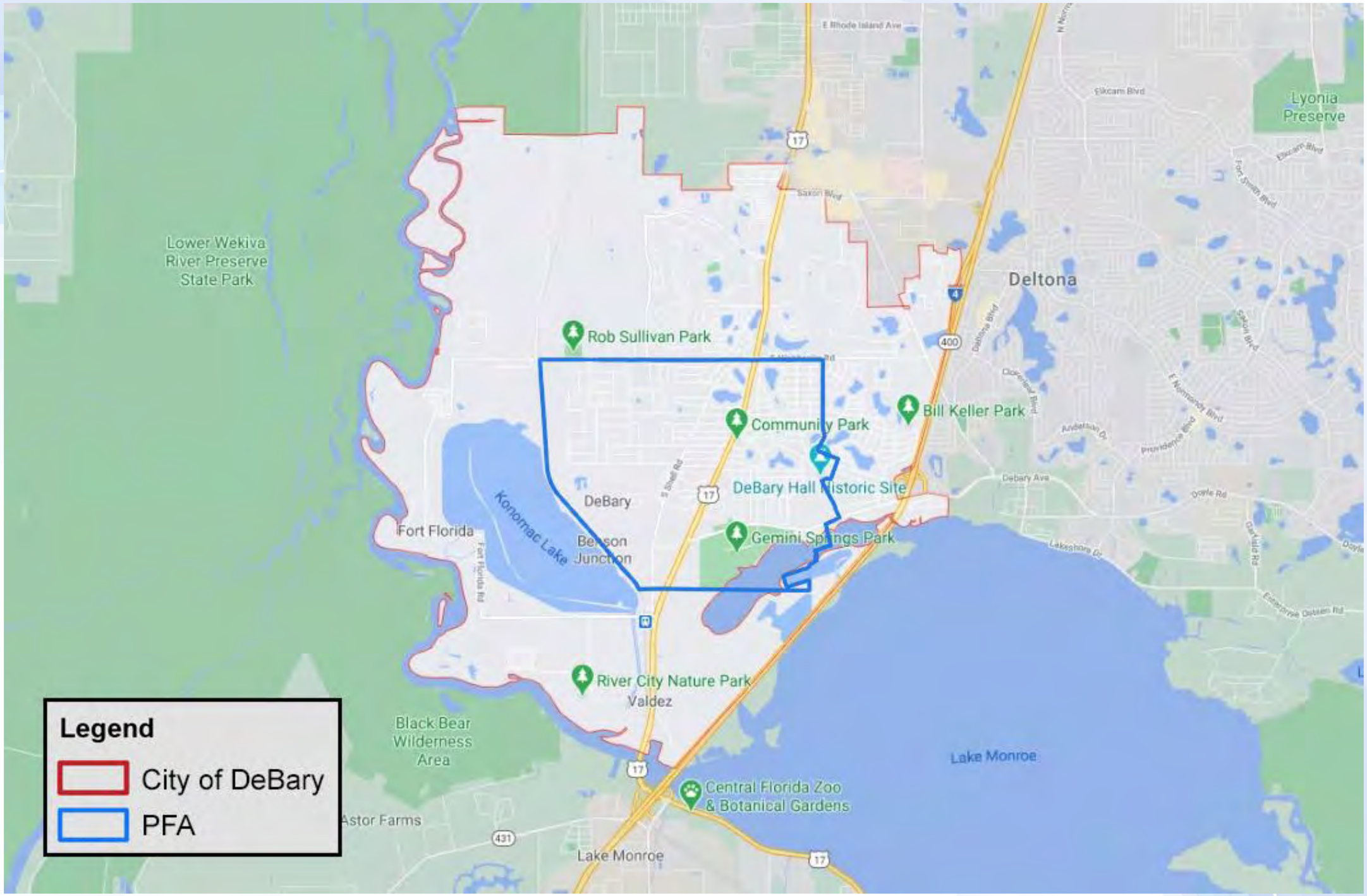


- Conventional septic systems are designed to protect human health, <u>not to remove nutrient pollution</u>.
- Septic systems on average contribute a load of 8.2 lbs-N/year per system to the springs.
- Septic systems work by slowly releasing wastewater through a drainfield, or soil absorption field.
- With over 2,000 septic systems currently in use in the Gemini Springs PFA, the nitrogen is polluting our springs and leaching into our groundwater - our drinking water source.

GEMINI SPRINGS REQUIRED REMEDIATION AREA



GEMINI SPRINGS PFA ENTIRELY WITHIN THE CITY OF DEBARY



WHAT IS AN OSTDS REMEDIATION PLAN?

A Plan to Reduce the Nutrient Load Coming from Septic Systems

- An **evaluation** of credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and spring systems.

- **Options** for repair, upgrade, replacement, drain modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action.

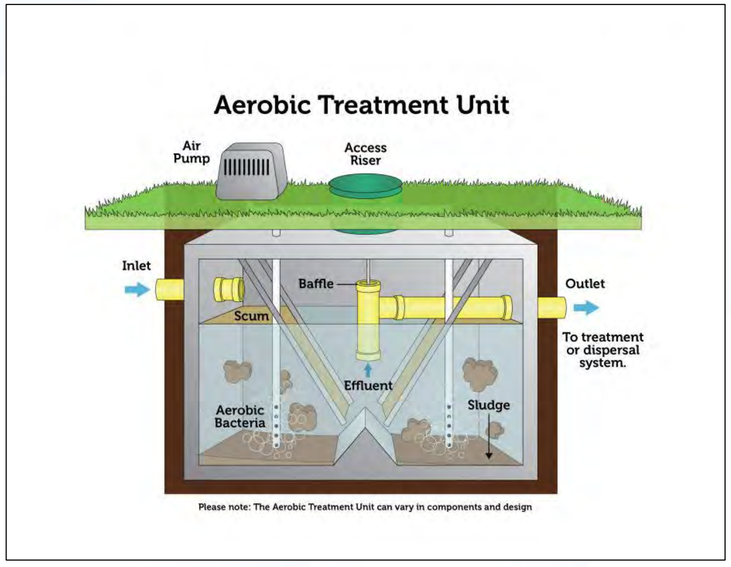
- A **public education plan** to provide area residents with reliable, understandable information about OSTDS (a.k.a. septic systems) and springs.

- **Cost-effective** and financially feasible **projects** necessary to reduce the nutrient impacts from OSTDS.

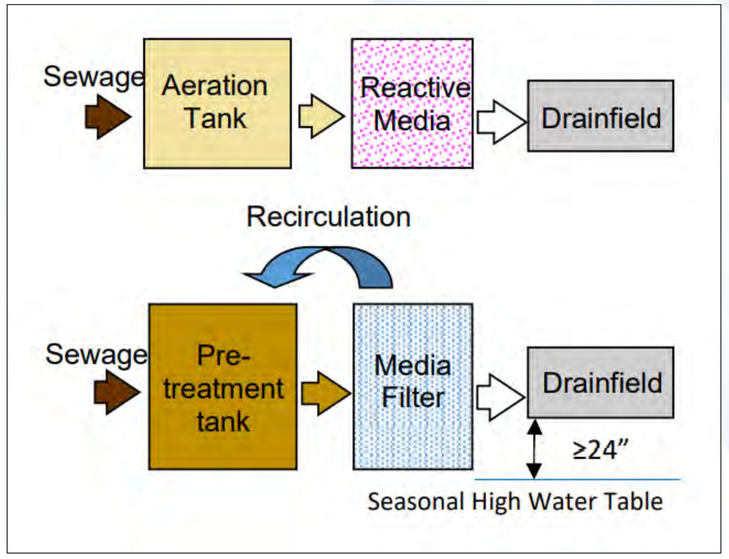
- A **priority ranking** for each project for funding contingent on appropriations in the General Appropriations Act.

DECENTRALIZED APPROACH

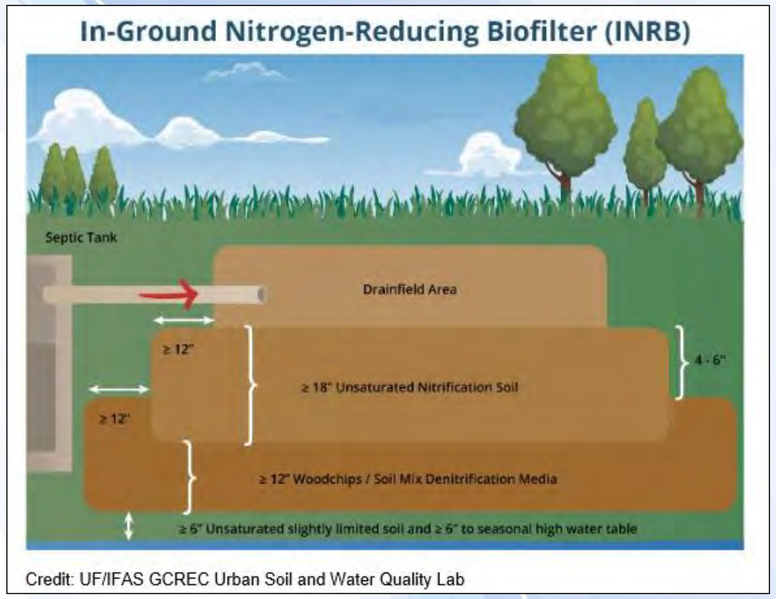
- Conventional septic systems cannot be used for lots less than one acre in the PFA for new homes or businesses with new septic systems and for existing systems when replacement is required unless sewer will be available within five years.
- Advanced Treatment Alternatives
  - Aerobic Treatment Units
  - Performance-Based Treatment System
  - In-Ground Nitrogen Reducing Biofilter (INRB)



Aerobic Treatment Units



Performance-Based Treatment Units



Credit: UF/IFAS GCREC Urban Soil and Water Quality Lab

DECENTRALIZED APPROACH

System Type	System Description	Considerations	Lifecycle Costs (40-Years)
Aerobic Treatment Units	• Systems typically consist of a pump, pipes, and diffusers and include a process to promote biological denitrification.	• Requires electrical connection. • Requires a maintenance contract and operating permit from the county health department.	Installation - $12,500-$17,500 Annual - $1,000-$1,500 (includes required inspections, electricity, routine pump out and anticipated system maintenance)
Performance-based Treatment Units	• Vary widely but include nitrogen-reducing aerobic treatment units and other components.	• Must be engineer-designed and permitted. • Require a maintenance contract and operating permit from the county health department.	Installation - $15,000-$20,000 Annual - $1,000-$1,500 (includes required inspections, electricity, routine pump out and anticipated system maintenance)
In-Ground Nitrogen Reducing Biofilter	• Modifies an OSTDS drainfield with layers of soil specially designed to promote natural N cycling processes that convert NO_3^- to an N gas that is lost to the atmosphere, thus removing N from the soil and groundwater.	• Research is ongoing, early estimates are that the soil media in an INRB can function for 20+ years before they need to be replaced or replenished • Significant Land requirements make challenging for small lots.	Installation - $10,000-$12,500 Annual - $250-$500 2nd Installation approx. year 20

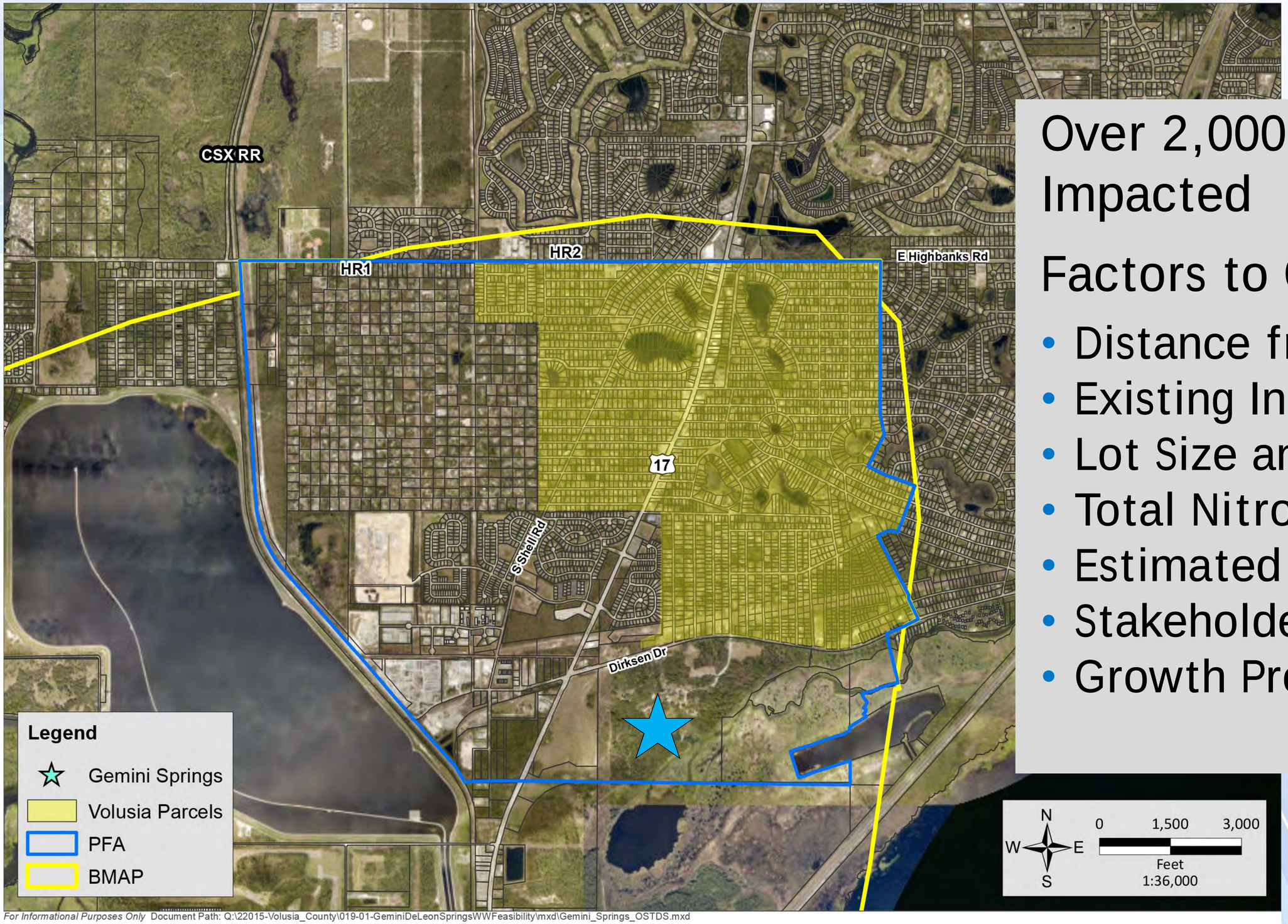
- Nitrogen reduction of up to approx. 5.3 lbs-N/yr/OSTDS removed.
- Estimated reduction of up to approx. 10,600 lbs-N/yr if all OSTDS on <1.0-acre parcels are upgraded in a decentralized approach

CENTRALIZED APPROACH

System Type	System Description	Considerations	Lifecycle Costs (40-Years)
Gravity Sewer Systems	• Involves gravity service laterals that connect to gravity sewer mains and then flows to localized lift stations. This system of lift stations pump into force mains used to transport the wastewater to a WWTF for treatment	-typically results in a greater disturbance to the residents -generally more reliable and less maintenance-intensive than other types of systems -service laterals are generally the customers' responsibility to maintain on their property	Installation - $30,000-$40,000 Annual - $400-$600
Vacuum Sewer Systems	• Includes a valve pit serving several customers, a vacuum collection system, and a vacuum collection station. Sewage flows by gravity from the homes/structures into a valve pit with pneumatic valve that operate by pressure (no electrical power is required). The valve pit pneumatic valve opens automatically when a given quantity of sewage accumulates in the valve pit.	-Disturbance to developed land resulting from construction is typically less than the disturbance from constructing a gravity collection system. -very little inflow and infiltration (I&I) occurs compared to gravity systems. -requires more O&M for the Utility than a gravity system since the pneumatic valve pits need to be inspected & maintained.	Installation - $17,500-$22,500 Annual - $400-$600
Low Pressure/ Grinder Pump Systems	• Uses a grinder pump station for each customer, installed on each customer's property or in ROW. Includes automatic pumps and control devices to convey the wastewater into a low-pressure collection system.	-low-pressure systems capital costs are generally lower than gravity or vacuum systems, operation and maintenance (O&M) costs are generally higher. -customers may be required to maintain the septic effluent pump, or provide an easement dedicated to the local government/utility to allow access onto the property to maintain the system.	Installation - $12,500-$17,500 Annual - $800-$1,000 Annual costs assume homeowner maintains the grinder pump.

- Nitrogen reduction of approx. 8.2 lbs-N/yr/OSTDS removed.
- Converting approx. 1,750 septic tanks to centralized sewer achieves the required nitrogen reduction.

CRITERIA USED TO ASSESS POTENTIAL PROJECT AREAS



For Informational Purposes Only Document Path: Q:\22015-Volusia_County\019-01-GeminiDeLeonSpringsWWFeasibility\mxd\Gemini_Springs_OSTDS.mxd

Over 2,000 Parcels Impacted

Factors to Consider

- Distance from Spring
- Existing Infrastructure
- Lot Size and Density
- Total Nitrogen Load
- Estimated Cost
- Stakeholder Input
- Growth Projections

BMAP TIMELINE

- BMAP implementation is intended to be a 20-year process with defined cumulative nitrogen reduction milestones.
  - 5-year - 30%
  - 10- year - 80%
  - 15-year - 100%
- TMDL concentration level to be met no later than the 20-year goal with a total reduction requirement of 14,270 lbs-N/year.

Nitrogen Removal 2018 – 2023	Nitrogen Removal 2023 – 2028	Nitrogen Removal 2028 – 2033	Total Nitrogen Removal by 2038
4,281 lbs	7,135 lbs	2,854 lbs	14,270 lbs

DECENTRALIZED SYSTEM REQUIREMENTS

- Advanced Treatment Units (ATUs) required on lots less than 1 acre
  - Will be required upon septic/drainfield repair or replacement after 2023 in the PFA (occurs on an average of 47 residential parcels annually)
  - Systems range in cost from $12,500-$20,000
- ATU Annual Maintenance Requirements
  - Two inspections annually by a certified entity ($300-$500 per inspection)
  - One inspection annually by the state
- Other anticipated requirements
  - Electrical consumption (approximately $85-240 annually)
  - Pump replacement every 2-3 years (approx. $80-$125 annualized)
  - System pump out every 2-3 years (approx. $160-$400 annualized)
- Annualized Cost $925-$1,765
- Onsite Sewage Program Transfers from FDOH to FDEP on 7/1/21

UTILITY RATES IN THE AREA

Comparison of Water & Sewer Rates (Feb 2021)

	Volusia Utilities (DeBary)			Orange City		
	Water	Sewer	Total	Water	Sewer	Total
Availability	15.08	23.19	38.27	12.69	23.91	36.60
3,000 gals	21.86	37.89	59.75	25.74	48.63	74.37
5,000 gals	26.38	47.69	74.07	34.44	65.11	99.55
7,000 gals	32.04	57.49	89.53	43.14	81.59	124.73

	Deltona			Deland		
	Water	Sewer	Total	Water	Sewer	Total
Availability	15.46	21.70	37.16	12.95	24.41	37.36
3,000 gals	21.91	76.21	98.12	19.85	38.90	58.75
5,000 gals	26.21	112.55	138.76	24.45	48.56	73.01
7,000 gals	34.87	159.81	194.68	32.05	58.22	90.27

NEXT STEPS?

- **Obtain** feedback from the City
- **Hold** public meeting to present information to residents
- **Evaluate** information received from public outreach
- **Receive** feedback from FDEP on proposed plan and address regulatory needs
- **Continue** City and County investment in nutrient reduction projects
- **Pursue** grant dollars to offset financial impacts to City and County residents

QUESTIONS OR COMMENTS

If you have questions or comments, please call or email

Erin Reed, PhD, PE
Water & Utilities Engineer
Volusia County Water Resources and Utilities
Office: 386.943.7027 ext. 13642
erinreed@volusia.org

Gemini Springs Nutrient Reduction Citizen Survey- Responses

February 24, 2021

We received **17** surveys from the Open House attendees. Outlined below is a summary of the information.

1. How strongly do you feel about protecting the water quality of Gemini Springs??

Very Strongly	7
Somewhat Strongly	6
Not Very Strongly	
Not Strongly at All	
Neutral	4
Did not answer	

2. What are the top 3 contributors to the water quality degradation in Gemini Springs??

Septic Tanks	9
Farm Fertilizer	7
Lawn/Turf Grass Fertilizer	14
Livestock Waste	5
WWTPs	3
Other	5
Did not answer	3

Doggie park poop
Rainwater runoff
Comment: Lack of Environmental Protection of Florida waters and waterways since long prior two 1960s
Habitat being forced out of their environment due to overbuilding.
Stormwater runoff from roadways in developments.

3. Are you familiar with the Florida Springs and Aquifer Protection Act?

Yes	4
Somewhat	8
No	5
Did not answer	

4. Are you familiar with how septic systems operate?

Yes	14
Somewhat	2
No	1
Did not answer	

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000, who should participate in addressing this issue?

All Volusia County residents	7
All City of DeBary residents	6
Home and Business Owners w/Septic Sys.	3
Project Area-specific Residents	1
Combination (Please specify)	8
Did not answer	2

DEP-State of Florida

State, County, City, Home & Business Owners

Businesses; All Volusia County Residents; State Government; All Taxpayers in Florida (Business and Private Citizens)

6. What is a reasonable business or homeowner investment to comply with the Florida Springs and Aquifer Protection Act?

$2,500-$5,000	7
$5,000-$7,500	1
$7,500-10,000	1
Did not answer	8

Comment: State mandate, state pays

Homeowner investment to comply with the Florida Springs and Aquifer Protection Act should be zero or minimal. Taxes throughout County and State should fund this project because it is a state mandate.

What kind of timeline are we expected to pay this?

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)

More information on what must be done in what areas of the county	6
More information on what homes/septic systems are impacted	5
More information on the cost of different alternatives	9
I have all the information I need	6
Did not answer	1

One did not answer.

8. All costs being equal, what would you prefer?

Centralized System	14
Decentralized System	1
Did not answer	2

Comment: Depends on funding

9. What should the county do to assist businesses or residents in meeting the requirements of the Florida Springs and Aquifer Protection Act?

Pursue grants	17

Allow residents to pay assessments over time	8
Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems	5
Develop a local funding source that provides an offset to costs	12
Did not answer	

One did not answer.

10. Is there any additional information you would like to provide or questions you would like to ask?

1. If St Johns River flows North doesn't Sanford and other areas South of DeBary flow by and into Gemini? Why do we have to pay for their gross dumping of nitrogen?
2. I moved here in 2000 - you had no provisions for me, so I did a septic system. Gemini was a mess then. I have been happy but no longer am goodbye DeBary I can't afford this.
3. Gemini Springs was a good swimming area at one time which now is closed. Why were the swimming areas closed? Is there enough water from these Springs for the swimming area? Once the septic to sewer project is underway/completed will the quality of the water at the Springs allow swimming again or will it remain inaccessible.
4. We are for sewer and water.
5. Florida's park and waters and waterways are available to all people not only those who live close by. **[*1]** Homes were allowed and permitted to be built with wells and septic tanks. Since government lacked foresight in allowing these conditions in, government should impose taxes and use fees (e.g. entrance fees) to help pay for the "needed" (suddenly) changes. Since this is a state mandate resolution of the groundwater issue must be accomplished by the state via taxes etc. stop development is 1 cure! Question: what environmental impact will occur when placing sewage and water lines?!!!
   ***1** - US citizen, non-US citizen, Floridians, and non-Floridians.
6. I would like to know the cost of public water here since I recently got out of Deltona water and hated it! $230/month 1 person!
7. Comments
   a. Is a CRA for the PFA still an option to help the funding capital improvements? Would it prevent other state funding/grants? If this takes 3 to 20 years, a CRA could raise a healthy portion of funds for such improvements.
   b. As the manager said, this is a 3 to 20 years process based on state funding. He also said the FDOH will seize allowing repair or installation of septic systems as of July 2023. If we are waiting for central sewer and the need arises to repair or replace my existing septic system, will I be forced to install a nutrient reducing septic system even though we approved a central system?
   c. Sewage will be treated at the WWTP on Donald E. Smith?
   d. Does DeBary impose limits on new construction ____ to reduce high need grass to <50% to lower fertilizer usage? Is there an overlay or requirement to use waterwise plants and at least 50% Bahia?

8. I would like the online Maps to be more conducive to be able to zoom into streets and be able to see current and proposed sewer /water lines to be run. Also, would help to be able to read the legends on the Maps.
9. Comments:
    a. Impact on future taxes.
    b. Impact on multifamily housing (i.e. apartments).
    c. Financing options.
    d. Grant funds feds fund states, states fund local government, County funds City. Grants come with “matching” should be in your proposal as [costs].
    e. All “people” in state benefit from clean water therefore, all should share in cost.
    f. This program falls short. Water should be also tested for chemical contaminants such as toxic: herbicides, algicides, pesticides: long restriction safe.
    g. Recycled water also has issues since no plants filter out medications, the use of chlorine to control bacteria. The safest drinking water is what nature provides away from man.
    h. Thanks for information and listening.

Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Volusia County residents
   - [ ] All City of DeBary residents
   - [x] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

CITY OF DEBARY 1993 FLORIDA

Volusia County FLORIDA

Florida Department of Environmental Protection

10. Is there any additional information you would like to provide or questions you would like to ask?

Name (optional) _____

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

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OVER FOR MORE

City of DeBary Florida 1993

Volusia County FLORIDA

Florida Department of Environmental Protection

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   - [X] Combination (please specify) DEP - STATE of FL

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OVER FOR MORE

CITY OF DeBARY 1993 FLORIDA

Volusia County FLORIDA

Florida Department of Environmental Protection

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   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other Maggie's park poop

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   are you kidding?

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9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

CITY OF DEBARY FLORIDA 1993

Volusia County FLORIDA

Florida Department of Environmental Protection

10. **Is there any additional information you would like to provide or questions you would like to ask?**

I moved here in
2000 - Lyon had no
provision for me.
so I did a septic System -
Gemini was a mess then -
I have been happy
but no longer can -
Good bye DeBary -
I can't afford this -

Name (optional) _____

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [X] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [X] Septic Tanks
   - [X] Farm Fertilizer
   - [X] Lawn and Turf Fertilizer
   - [X] Livestock Waste
   - [X] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [X] No

4. Are you familiar with how septic systems operate?
   - [X] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Volusia County residents
   - [X] All City of DeBary residents
   - [X] Home and business owners with septic systems
   - [X] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [X] More information on what homes/septic systems are impacted
   - [X] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [X] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [X] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [X] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [X] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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Volusia County FLORIDA

Florida Department of Environmental Protection

10. Is there any additional information you would like to provide or questions you would like to ask?

Demini Springs was a good swimming area at one time which now is closed. Why were the swimming areas closed? Is there enough water from the springs for the swimming area? Once the septic to Sewer project is underway/completed will the quality of the water at the springs allow swimming again or will it remain unusable.

Name (optional) _____

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Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [ ] Septic Tanks
   - [ ] Farm Fertilizer
   - [ ] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Volusia County residents
   - [ ] All City of DeBary residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify)

   STATE, COUNTY + CITY + HOME + BUS. OWNERS

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [x] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

CITY OF DEBARY 1993 FLORIDA

Volusia County FLORIDA

Florida Department of Environmental Protection

10. Is there any additional information you would like to provide or questions you would like to ask?

WE ARE FOR SEWER AND WATER.

Name (optional) JOHN GIULIANI, JENNIFER CARTIER, 417 SANFORD LLC'S
226 DEBARY DR 214 DEBARY DR 8 LOTS.
LAGO VISTA ST.
&
LINDO VISTA ST

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [x] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [ ] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [x] Wastewater Treatment Plants
   - [ ] Other RAIN WATER RUNOFF

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Volusia County residents
   - [ ] All City of DeBary residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   STATE

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

   STATE MANDATE STATE PAYS

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [x] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
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9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

OVER FOR MORE ➡

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Volusia County FLORIDA

Florida Department of Environmental Protection

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Name (optional) _____

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Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - ☐ Very Strongly
   - ☑ Somewhat Strongly
   - ☐ Not Very Strongly
   - ☐ Not Strongly at All
   - ☐ Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - ☐ Septic Tanks
   - ☐ Farm Fertilizer
   - ☑ Lawn and Turf Fertilizer
   - ☐ Livestock Waste
   - ☐ Wastewater Treatment Plants
   - ☐ Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - ☐ Yes
   - ☑ Somewhat
   - ☐ No

4. Are you familiar with how septic systems operate?
   - ☑ Yes
   - ☐ Somewhat
   - ☐ No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - ☑ All Volusia County residents
   - ☐ All City of DeBary residents
   - ☐ Home and business owners with septic systems
   - ☐ Project area-specific residents
   - ☐ Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - ☑ $2,500 - $5,000
   - ☐ $5,000 - $7,500
   - ☐ $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ☐ More information on what must be done in what areas of the county
   - ☑ More information on what homes/septic systems are impacted
   - ☑ More information on the cost of different alternatives
   - ☐ I have all the information I need

8. All costs being equal, what would you prefer?
   - ☑ Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - ☐ Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - ☑ Pursue grants
   - ☐ Allow residents to pay assessments over time
   - ☐ Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - ☑ Develop a local funding source that provides an offset to costs

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Volusia County FLORIDA

Florida Department of Environmental Protection

10. **Is there any additional information you would like to provide or questions you would like to ask?**

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Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [ ] Septic Tanks 41%
   - [1] Farm Fertilizer 46%
   - [2] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [3] Other Lack of Environmental protection of FLORIDA'S WATERS AND WATERWAYS SINCE Long PRIOR TO 1960'S !!

3. Are you ~~familiar with~~ the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [ ] Somewhat
   - [x] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Volusia County residents
   - [ ] All City of DeBary residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify)

   Businesses; all Volusia County residents; State government; ALL TAX payers in FLORIDA! (Business and private citizens)

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000
   - [x] ZERO or Minimal; TAXES Throughout County and State should fund this project Because IT is A State Mandate!!

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

   Depends on FUNDING

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs (generalized taxes as example)

OVER FOR MORE

CITY OF DEBARY 1993 FLORIDA

Volusia County FLORIDA

Florida Department of Environmental Protection

10. Is there any additional information you would like to provide or questions you would like to ask?

FLORIDA'S PARKS AND WATERS AND WATERWAYS ARE AVAILABLE TO ALL PEOPLE NOT ONLY THOSE WHO LIVE CLOSE BY.* HOMES WERE ALLOWED AND PERMITTED TO BE BUILT WITH WELLS AND SEPTIC TANKS. SINCE government lacked foresight in allowing these conditions in government should impose taxes and use fees (e.g., entrance fees) to help pay for the "needed" (suddenly) changes.
SINCE THIS IS A STATE MANDATE... RESOLUTION OF THE groundwater issue(s) MUST be accomplished by the STATE via taxes etc. Stop Development is one CURE!

Q: What environmental "impact" will occur when placing sewage and water lines?!!!

*US citizen, non us citizens, FLORIDIANS, and non FLORIDIANS!

Name (optional) _____

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [x] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Volusia County residents
   - [x] All City of DeBary residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [x] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [x] More information on the cost of different alternatives
   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
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Florida Department of Environmental Protection

10. Is there any additional information you would like to provide or questions you would like to ask?

Name (optional) _____

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Volusia County
FLORIDA

Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [x] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [ ] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [x] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other habitat being forced out of their environment due to over building

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Volusia County residents
   - [ ] All City of DeBary residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

   -0-

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
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   - [ ] I have all the information I need

8. All costs being equal, what would you prefer?
   - [ ] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [x] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [ ] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
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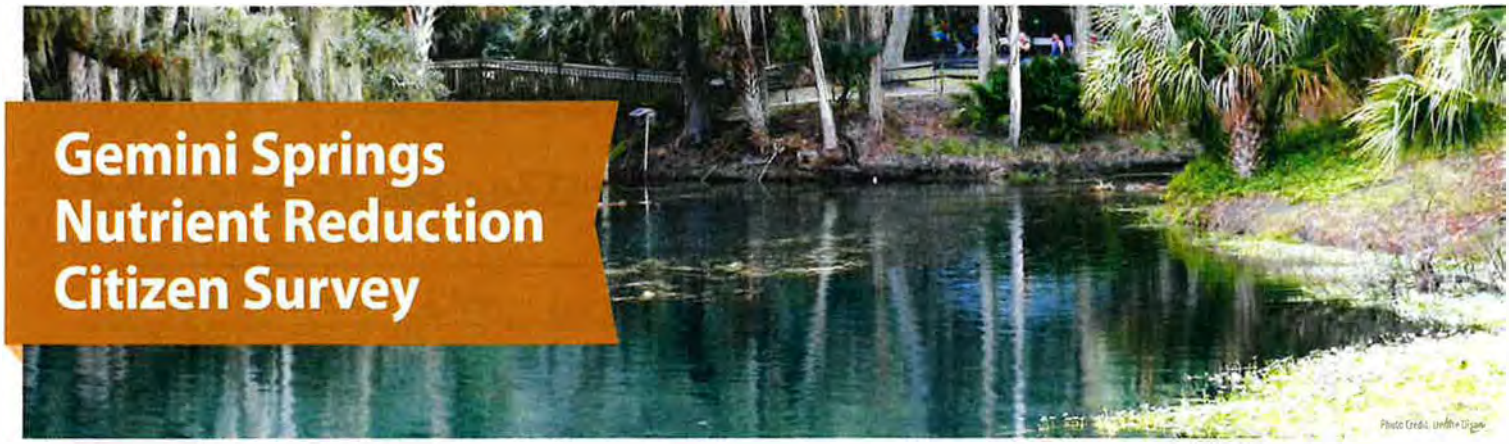
10. **Is there any additional information you would like to provide or questions you would like to ask?**

Name (optional) _____

You may submit via email to
erinreed@volusia.org
or sewer@debary.org



Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [x] Septic Tanks
   - [x] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [ ] Yes
   - [x] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Volusia County residents
   - [ ] All City of DeBary residents
   - [x] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [x] Combination (please specify)

   See above

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
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10. **Is there any additional information you would like to provide or questions you would like to ask?**

I want to know if city water is mandated! answered

I would like to know the cost of public water here since I recently got out of Deltona Water & hated it! $230/month 1 person!

Name (optional) Linda Parkin

linda.parkin871@gmail.com

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

CITY OF DeBARY 1993 FLORIDA

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Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [ ] Very Strongly
   - [x] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [x] Septic Tanks (3)
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer (1)
   - [x] Livestock Waste (2)
   - [ ] Wastewater Treatment Plants
   - [ ] Other _____

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [ ] All Volusia County residents
   - [x] All City of DeBary residents
   - [ ] Home and business owners with septic systems
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   - [ ] Combination (please specify)

   _____

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   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [x] $7,500 - $10,000

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   - [ ] More information on what homes/septic systems are impacted
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   - [x] Pursue grants
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   - [x] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [x] Develop a local funding source that provides an offset to costs

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Florida Department of Environmental Protection

10. Is there any additional information you would like to provide or questions you would like to ask?

→ Is a CRA for the PFA still an option to help with funding capital improvements? Would it prevent other state funding / grants? If this takes 3-20 years, a C.R.A. could raise a healthy portion of funds for such improvements.

→ As the manager said, this is a 3-20 year process based on state funding. He also said the FDOH will cease allowing repair or installation of septic systems as of July 2023. If we are waiting for central sewer AND the need arises to repair or replace my existing septic system, will I be forced to install a nutrient reducing septic system even though we approved a central system?

→ Sewage will be treated at the WWTP on Donald E. Smith?

→ Does DeBary impose limits on new construction lawns to reduce high need grass to ≤50% to lower fertilizer usage?

Name (optional) SUSAN F. REED

WANDASFR@BELLSOUTH.NET

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

→ Is there an overlay or requirement to use waterwise plantings and at least 50% Bahia?

CITY OF DEBARY FLORIDA 1993

Volusia County FLORIDA

Florida Department of Environmental Protection

Gemini Springs Nutrient Reduction Citizen Survey

1. How strongly do you feel about protecting the water quality of Gemini Springs?
   - [x] Very Strongly
   - [ ] Somewhat Strongly
   - [ ] Not Very Strongly
   - [ ] Not Strongly at All
   - [ ] Neutral

2. What do you think are the top 3 contributors to the water quality deterioration in Gemini Springs?
   - [x] Septic Tanks
   - [ ] Farm Fertilizer
   - [x] Lawn and Turf Fertilizer
   - [ ] Livestock Waste
   - [ ] Wastewater Treatment Plants
   - [x] Other STORMWATER Runoff From Roadways in Developments

3. Are you familiar with the Florida Springs and Aquifer Protection Act?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

4. Are you familiar with how septic systems operate?
   - [x] Yes
   - [ ] Somewhat
   - [ ] No

5. Considering the cost of reducing nitrogen coming from a septic tank is between $25,000 and $30,000 per system, who should participate in funding this program?
   - [x] All Volusia County residents
   - [ ] All City of DeBary residents
   - [ ] Home and business owners with septic systems
   - [ ] Project area-specific residents
   - [ ] Combination (please specify)

   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [ ] $2,500 - $5,000
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

   What kind of timeline are we expected to pay this?

7. What type of additional information do you need to develop an informed opinion of your preference for improved wastewater treatment as required by the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [ ] More information on what must be done in what areas of the county
   - [ ] More information on what homes/septic systems are impacted
   - [ ] More information on the cost of different alternatives
   - [x] I have all the information I need

8. All costs being equal, what would you prefer?
   - [x] Centralized wastewater treatment where the local utility provider has responsibility for treatment and disposal and homeowner pays a reasonable bill
   - [ ] Decentralized wastewater treatment where the homeowner has responsibility for treatment and disposal and all associated fees and expenses

9. What should the county and city do to assist residents in meeting the requirements of the Florida Springs and Aquifer Protection Act? (Select All That Apply)
   - [x] Pursue grants
   - [x] Allow residents to pay assessments over time
   - [ ] Provide ongoing information regarding the available technologies to address nitrogen impacts coming from septic systems
   - [ ] Develop a local funding source that provides an offset to costs

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Florida Department of Environmental Protection

10. Is there any additional information you would like to provide or questions you would like to ask?

I would like the online maps to be more conducive to being able to zoom in to streets, and be able to see current and proposed sewer/water lines to be run. Also would help to be able to read the legends on the maps.

Name (optional) Keith Lovell (Bubbabubb6@icloud.com)

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

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Volusia County FLORIDA

Florida Department of Environmental Protection

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   _____

6. What is a reasonable homeowner investment to comply with the Florida Springs and Aquifer Protection Act?
   - [x] $2,500 - $5,000 or less
   - [ ] $5,000 - $7,500
   - [ ] $7,500 - $10,000

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10. Is there any additional information you would like to provide or questions you would like to ask?

1. Impact on Future taxes
2. Impact on multi-family housing (ie, apartments)
3. Financing options
4. Grant funds Feds Fund states, state fund local government County Funds City Grants come with "matching" → should be in your proposal! as [costs]
5. All 'people' in state benefit from clean water therefore, ALL should share in costs
6. This program falls SHORT Water should be also tested for chemical contaminents such as toxic herbacides, allegecides, pesticides : law restrictions etc
7. Recycled water also has issues since no plants filter out medications, the use of chlorine to control bacteria. The safest drinking water is what Nature provides AWAY from MAN

Thanks for info and listening!

Name (optional) Paul Palmer
52 Dahlia Dr, Debary

You may submit via email to
erinreed@volusia.org
or sewer@debary.org

Erin Reed - [EX] Re: DeBary Septic to Sewer livestream

From: Deb <debnjoe@atlantic.net>
To: <erinreed@volusia.org>
Date: 2/24/2021 6:20 PM
Subject: [EX] Re: DeBary Septic to Sewer livestream

***CAUTION:** This email originated from outside Volusia County's email system. DO NOT CLICK links or attachments unless you recognize the sender and/or know the content is safe.*

If DeBary goes with centralized sewer, will individual homeowners be able to opt for decentralized?

In other words, if the city chooses centralized, would all of us be mandated to connect to that?

Wastewater Feasibility Study for the Protection of Gemini Springs

July 14, 2021

Presentation Overview

Brief History of the Project

- Florida Springs and Aquifer Protection Act
- OSTDS Remediation Plan Requirements
- PFA for Gemini Springs

Project Alternatives

- Decentralized
- Centralized

Financial Analysis

- Financial Model
- Anticipated Costs
- Potential Grants

Grant Analysis

- Decentralized
- Centralized

Next Steps

- Direction from City Council
- Submit Report to FDEP

Florida Springs and Aquifer Protection Act

- Passed by State Legislature in 2016
- Requirements of the Act
  - TMDLs must be established for first magnitude springs by December 2018
  - Priority Focus Areas (PFAs) are the *area* where a *spring* is likely to be most adversely impacted by activities established for Outstanding Florida Springs

  - Onsite Sewage Treatment and Disposal Systems (OSTDS) Remediation Plan required for areas where septic systems have greater than 20% contribution to the nutrient load in the Priority Focus Area
- OSTDS/Septic systems were determined to contribute more than 40% of the nutrient load to Gemini Springs

OSTDS Remediation Plan Requirements

- Evaluation of credible scientific information on the effects of nitrogen on springs and spring systems
- **Options for repair, upgrade, replacement, drain field modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action**
- **Cost-effective and financially feasible projects necessary to reduce the nutrient impacts from OSTDS**
- A priority ranking for each project for funding contingent on appropriations in the General Appropriations Act
- A public education plan to provide area residents with reliable, understandable information about OSTDS and springs

Priority Focus Area (PFA) Requirements and Septic Systems

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Over 2,000 Impacted Parcels in the PFA

- On lots of less than 1-acre no <u>new</u> conventional septic systems allowed
- Plan for existing septic systems to add nitrogen reducing features through ATUs or centralized sewer

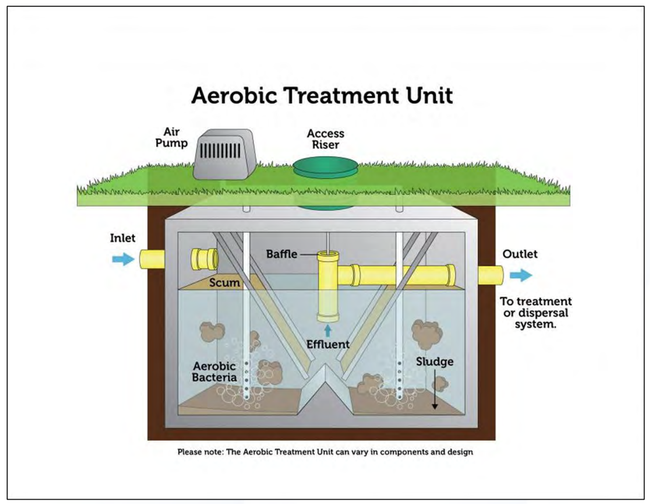
Gemini BMAP Timeline

- BMAP implementation is intended to be a 20-year process with defined cumulative nitrogen reduction milestones
  - 5-year - 30%
  - 10- year - 80%
  - 15-year - 100%
- TMDL concentration level to be met no later than the 20-year goal with a total reduction requirement of 14,270 lbs-N/year

Nitrogen Removal 2018 – 2023	Nitrogen Removal 2023 – 2028	Nitrogen Removal 2028 – 2033	Total Nitrogen Removal by 2038
4,281 lbs	7,135 lbs	2,854 lbs	14,270 lbs

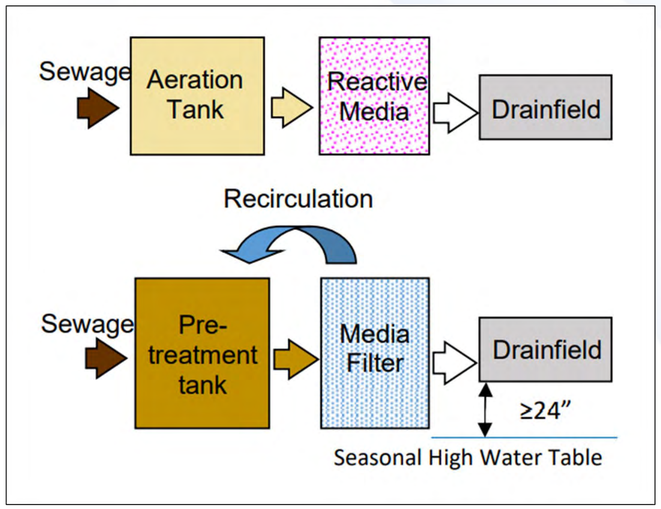
Decentralized Technologies

- Conventional septic systems cannot be used for lots less than one acre in the PFA for new homes or businesses with new septic systems and for existing systems when replacement is required unless sewer will be available within five years.
- Advanced Treatment Alternatives
  - Aerobic Treatment Units
  - Performance-Based Treatment System
  - In-Ground Nitrogen Reducing Biofilter (INRB)



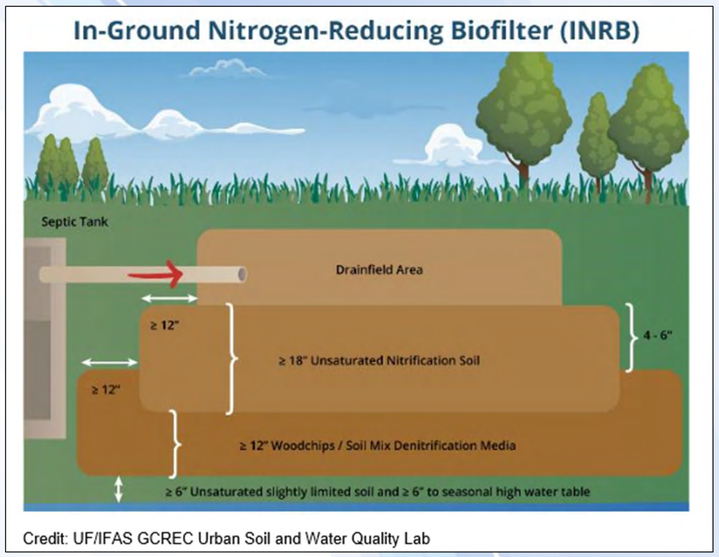
Aerobic Treatment Units

Average 65% N Removal



Performance-Based Treatment Units

Average 65-85% N Removal



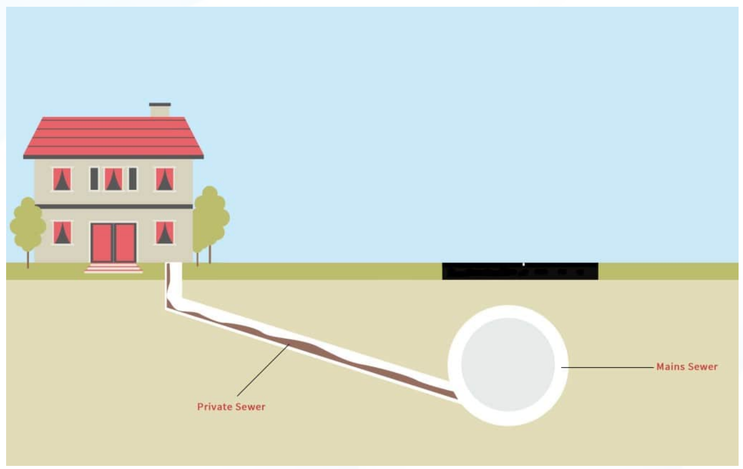
Average 65% N Removal

Centralized Technologies

- Conventional septic systems cannot be used for lots less than one acre in the PFA for new homes or businesses with new septic systems and for existing systems when replacement is required unless sewer will be available within five years.

Central Sewer Alternatives

Average 95% Nitrogen Removal



Gravity

Low Pressure

Vacuum

Planned Approach

- Narrowing Strategy - Install Just a Sewer System, Not Water
  - Reasoning
    - There are no FDEP grants to install water systems
    - Cost of construction has skyrocketed
    - Installation of water systems will impact roads
    - BMAP requirements are focused on nutrient reduction from Septic
    - Does appear to be a full commitment from the community to mandate water hookup

Planned Approach

- Narrowing Strategy - Implementing a Centralized System
  - Reasoning
    - ATU's are too expensive to individual homeowner
    - ATU's will not reduce the nutrient load to Gemini Springs as required by FDEP
    - Centralized System is most cost effective and reliable system long-term
    - Any new technologies, as they come along during implementation, can be piloted and tested with FDEP approval

Planned Approach

- Vacuum Sewer System
  - The BEST centralized system for this project is the Vacuum Sewer System
- Reasoning
  - Vacuum System is cheaper to implement, has the same performance as a conventional centralized system, and less burden on the current infrastructure
  - Proven Technology

Planned Approach

- Value to Residents
  - Greater use of your land
  - DOH data reveals within the PFA 47 homes per year are replacing leach fields
  - Over the next 20 years, most if not all systems will have to be replaced

State Level Expectations of Local Effort

- Shovel-Ready Projects Preferred
- Connection Commitments
  - SJRWMD requirements
  - FDEP expectations
- Local government financial commitment
  - SJRWMD Cost Share requirements
  - FDEP Springs dollars

Financial Model

- Septic to Sewer Financial Model
  - Dynamic financial model to evaluate feasibility of central sewer construction and operations
  - Multi-year analysis including debt repayment scenarios based on project life cycle
- $54 million septic to sewer program
  - 5-year construction program
  - Volusia County Utilities administration
    - debt issuance
    - operations

Financial Analysis

- Considerations
  - All available grants will be pursued but no grants are guaranteed
  - This is a long-term issue - residents in the PFA on less than an acre will be required to make a change at some point
- Assumptions
  - We must have a minimum of 75% external grant dollars for a program to move forward
  - We must have a dedicated (25%) local funding source to match grant dollars
  - Some form of mandatory connection is essential to optimize grant potential and secure elements of certain local sources

Anticipated Monthly Cost to Homeowners

Monthly Requirement	Monthly Cost
Wastewater Bill	$47.69
Collection System Assessment	$28*
Total	$75.69

*Based on $5,000 non-ad valorem assessment (if $5,000 paid upfront, then no monthly assessment); amount includes $3,000 allowance for onsite lateral and septic tank removal.

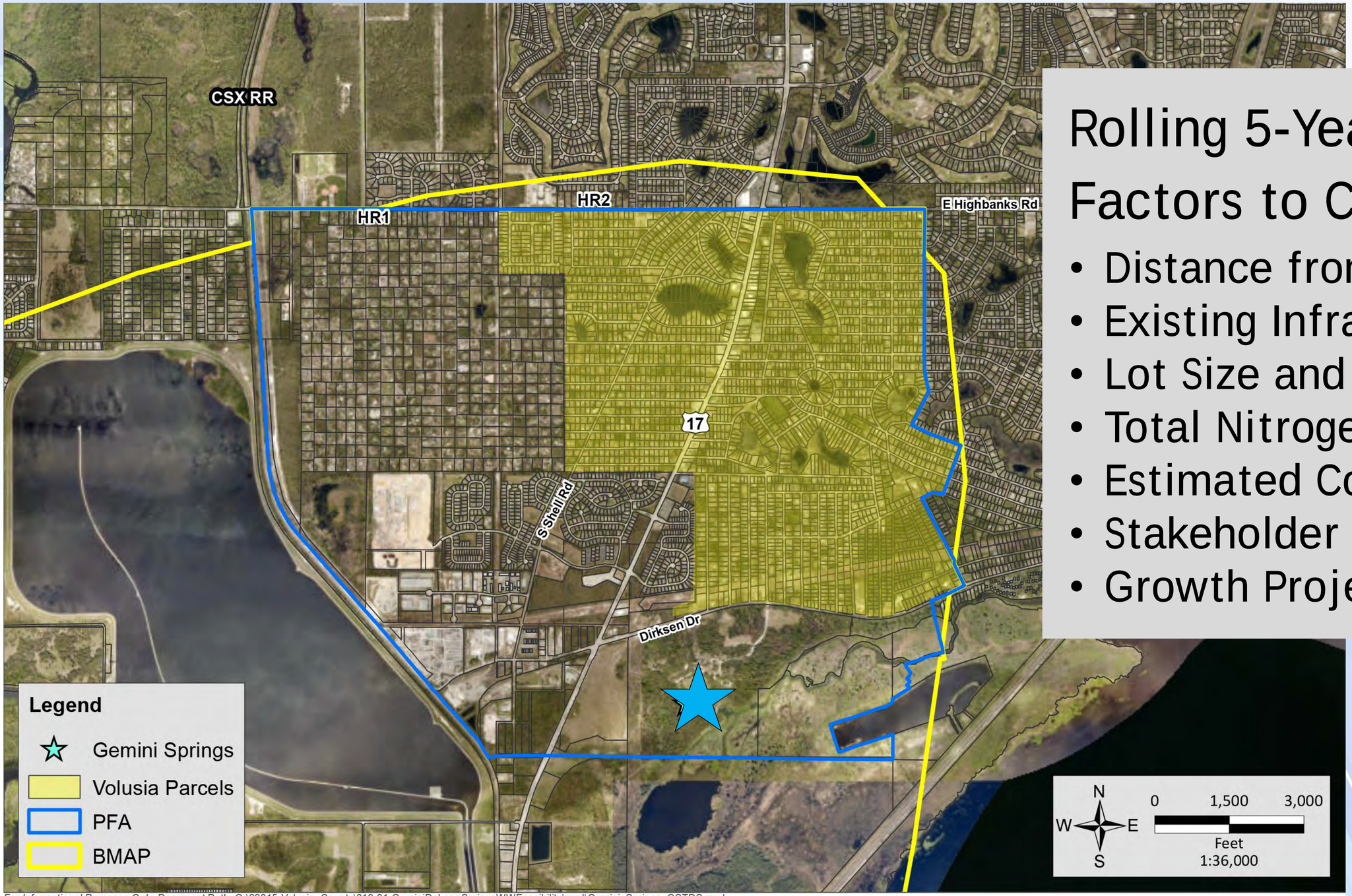
Utility Rates in the Area

Comparison of Monthly Wastewater Bills (July 2021)

Flat sewer rate based on 5,000 gallons monthly usage

	5,000 Gallons
Volusia County / DeBary	**$47.69**
Deltona	$112.55
DeLand	$48.56
Orange City	$65.11

Criteria Used to Assess Potential Project Areas



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Rolling 5-Year Plan Factors to Consider

- Distance from Spring
- Existing Infrastructure
- Lot Size and Density
- Total Nitrogen Load
- Estimated Cost
- Stakeholder Input
- Growth Projections

Potential Grant Funding Sources

Name	Funding Source	Eligible Projects	General Description	Requirements
Springs Grant	FDEP	Centralized sewer improvements, septic to sewer	Funding allocated for projects associated with nitrogen reduction in the BMAPs of springs identified in the FSAPA	Annual application process through FDEP or WMD
SRJWMD Cost Share	SJRWMD	Centralized sewer improvements, septic to sewer	Funding for projects that assist in creating sustainable water resources, provide flood protection and enhance conservation efforts. Funding may be available for local governments, agricultural interests and other entities.	Annual application process through WMD
Water Quality Grants	FDEP	Homeowner side improvements associates with S2S	Provides up to a 50% matching grant to local governmental entities for wastewater and stormwater improvements, including septic conversion and remediation.	Annual application process through FDEP
S2S Connection Grant	FDEP	Homeowner side improvements associates with S2S	Provides funding for homeowner side costs of septic to sewer projects in the springs areas as well as some cost offsets for ATUs required in springs areas.	Application process through FDEP
Legislative Appropriation	State Legislature (Administered by FDEP)	Wastewater improvements including septic to sewer	Provides funding for specifically identified projects requested through specific legislative offices and approved through the legislative process. Must be approved by the Governor.	Requires request from local gov't to state during legislative process.
ARPA	State, County and City	Wastewater improvements including septic to sewer	Funding allocations to state and local governments with wastewater as an eligible area of expenditure	Determined by Treasury

Next Steps – Council Guidance and Concurrence

Obtain concurrence on:

- Acceptable internal funding approach
- Mandatory connection
- Grant percentage and on pursuit of grant dollars in support of prioritized projects
- Submitting report to FDEP

Questions or Comments

If you have questions or comments, please call or email

Erin Reed, PhD, PE
Water & Utilities Engineer
Volusia County Water Resources and Utilities
Office: 386.943.7027 ext. 13642
erinreed@volusia.org

Decentralized System Requirements

- Advanced Treatment Units (ATUs) required on lots less than 1 acre
  - Will be required upon septic/drainfield repair or replacement after 2023 in the PFA (occurs on an average of 47 residential parcels annually)
  - Systems range in cost from $12,500-$20,000
- ATU Annual Maintenance Requirements
  - Two inspections annually by a certified entity ($300-$500 per inspection)
  - One inspection annually by the state
- Other anticipated requirements
  - Electrical consumption (approximately $85-240 annually)
  - Pump replacement every 2-3 years (approx. $80-$125 annualized)
  - System pump out every 2-3 years (approx. $160-$400 annualized)
- Annualized Cost $925-$1,765
- Onsite Sewage Program Transfers from FDOH to FDEP on 7/1/21

Available Technologies - Decentralized

System Type & Description	Considerations	Costs	Cost/lb Removal
Aerobic Treatment Units – Systems typically consist of a pump, pipes, and diffusers and include a process to promote biological denitrification.	• Requires electrical connection. • Requires a maintenance contract and operating permit from the county health department.	Installation - $12,500-$20,000 Annual Homeowner: $925-$1,765 (includes required inspections, electricity, routine pump out and anticipated system maintenance)	~$370
Performance-based Treatment Units – Vary widely but include nitrogen-reducing aerobic treatment units and other components.	• Must be engineer-designed and permitted. • Requires electrical connection. • Require a maintenance contract and operating permit from the county health department.	Installation - $15,000-$25,000 Annual Homeowner- $1,000-$1,500 (includes required inspections, electricity, routine pump out and anticipated system maintenance)	~$340
In-Ground Nitrogen Reducing Biofilter – Modifies an OSTDS drainfield with layers of soil specially designed to promote natural N cycling processes that convert NO_3^- to an N gas that is lost to the atmosphere, thus removing N from the soil and groundwater.	• Research is ongoing, early estimates are that the soil media in an INRB can function for 20+ years before they need to be replaced or replenished. • Significant land requirements make difficult to impossible for small lots.	Installation - $10,000-$12,500 Annual Homeowner: $250-$500 2nd Installation approx. year 20	~$245

Decentralized = Removes approximately 5.3 lbs N/year per septic system converted

Available Technologies - Centralized

System Type & Description	Considerations	Costs	Cost/lb Removal
Gravity Sewer Systems – Involves gravity service laterals that connect to gravity sewer mains and then flows to localized lift stations. This system of lift stations pump into force mains used to transport the wastewater to a WWTF for treatment.	• Typically results in a greater disturbance to the residents. • Generally more reliable and less maintenance-intensive than other types of systems. • Service laterals are generally the customers' responsibility to maintain on their property.	Capital: $40,000 Annual O&M: $400 Annual Homeowner – Flat Rate x 12	~$170
Vacuum Sewer Systems – Includes a valve pit serving several customers, a vacuum collection system, and a vacuum collection station. Sewage flows by gravity from the homes/structures into a valve pit with pneumatic valve that operate by pressure (no electrical power is required). The valve pit pneumatic valve opens automatically when a given quantity of sewage accumulates in the valve pit.	• Disturbance to developed land resulting from construction is typically less than the disturbance from constructing a gravity collection system. • Very little inflow and infiltration (I&I) occurs compared to gravity systems. • Requires more O&M for the Utility than a gravity system since the pneumatic valve pits need to be inspected & maintained.	Capital: $22,500 Annual O&M: $600 Annual Homeowner – Flat Rate x 12	~$140
Low Pressure/Grinder Pump Systems – Uses a grinder pump station for each customer, installed on each customer's property or in ROW. Includes automatic pumps and control devices to convey the wastewater into a low-pressure collection system.	• Low-pressure systems capital costs are generally lower than gravity or vacuum systems, operation and maintenance (O&M) costs are generally higher. • Customers may be required to maintain the septic effluent pump, or provide an easement dedicated to the local government/utility to allow access onto the property to maintain the system.	Capital: $17,500 Annual O&M: $400 Annual Homeowner O&M - $1,000 Annual costs assume homeowner maintains the grinder pump. Flat Rate x 12	~$225

Centralized = Removes approximately 8.2 lbs N/year per septic system converted

Traditional Revenue Sources

Governance Vehicle	Funding Source	Legal Authority	General Description	Approx. Revenue
County	General or Limited (by geographic area) Ad Valorem Millage	Art. VII, §9(b), Fla. Const.	Countywide property tax up to 10 mills that is available for any County purpose.	$1,900,000 / year (at a 0.1 millage)
County	Communication Services Tax(2)	§202.19, Fla. Stat.	Tax on communications services that is available for any public purpose.	De minimis < $100,000 annually
Municipal Service Taxing Unit ("MSTU")	Ad Valorem Taxes	§125.01(1)(q) and (r), Fla. Stat.	Property tax (can be less than countywide) up to 10 mills in aggregate that is available to fund municipal services and improvements.	See County-wide revenue generation.(3)
Independent Special District	Voter Approved Ad Valorem and Special Assessments(1)	Chapter 189, Fla. Stat.	Separate specialized unit of government with authority to levy property taxes up to a voter approved millage rate and/or special assessments.	See County-wide revenue generation.(3)
County	Utility Fee(2)	Art. VIII, §1(f), Fla. Const.; §125.01, Fla. Stat.	Utility fees included in an approved rate tariff that may include a portion of the capital costs in system wide rates or may include a targeted capital surcharge.	$500,000 per year (Based on a 2.0% rate increase)
Municipal Service Benefit Unit ("MSBU")	Special Assessments(1)	§125.01(1) (q) and (r), Fla. Stat.	Non-ad valorem special assessment on benefitted properties to cover the cost of the improvement or service providing the benefit.	$4,500 / parcel (approx. $24/mo. over 20-yrs)

(1) May be pledged to secure debt without voter approval. (2) Subject to additional restrictions based on existing debt documents.
(3) Fewer parcels will produce less revenues than shown above.

Appendix B

Detailed Non-Residential Wastewater Flow Assumptions

Table B-1 Detailed Non-Residential Wastewater Flow Assumptions

DOR UC	Description	Data	Flow Rate	Conversion Factor
10	Vacant Commercial – with/without extra features			
11	Stores, one story	Sum of TOT_LVG_AR	200 per bathroom	2 bathrooms/1,500 square feet (SF)
12	Mixed use – store and office or store and residential combination	Sum of TOT_LVG_AR	200 per bathroom	2 bathrooms/1,500 SF
13	Department Stores	Sum of TOT_LVG_AR	200 per bathroom	2 bathrooms/1,500 SF
16	Community Shopping Centers	Sum of TOT_LVG_AR	0.1 gallons per SF (GPSF)	N/A
17	Office buildings, non-professional service buildings, one story	Sum of TOT_LVG_AR	15 gallons per 100 SF	N/A
18	Office buildings, non-professional service buildings, multi-story	Sum of TOT_LVG_AR	15 gallons per 100 SF	N/A
19	Professional service buildings	Sum of TOT_LVG_AR	15 gallons per 100 SF	N/A
20	Airports (private or commercial), bus terminals, marine terminals, piers, marinas	COUNT_DOR_UC	3 gallons per passenger	N/A
21	Restaurants, cafeterias	Sum of TOT_LVG_AR	40 to 60 gallons per seat	11 to 15 SF/seat
22	Drive-in Restaurants	Sum of TOT_LVG_AR	40 to 60 gallons per seat	11 to 15 SF/seat
23	Financial institutions (banks, saving and loan companies, mortgage companies, credit services)	Sum of TOT_LVG_AR	15 gallons per 100 SF	N/A
25	Repair service shops (excluding automotive), radio and TV repair, refrigeration service, electric repair, laundries, Laundromats	Sum of TOT_LVG_AR	10 gallons per 100 SF	N/A
26	Service stations	COUNT_DOR_UC	200 per bathroom	2 bathrooms
27	Auto sales, auto repair and storage, auto service shops, body and fender shops, commercial garages, farm and machinery sales and services, auto rental, marine equipment, trailers and related equipment, mobile home sales, motorcycles, construction vehicle sales	Sum of TOT_LVG_AR	10 gallons per 100 SF	N/A
30	Florists, greenhouses	Sum of TOT_LVG_AR	15 gallons per 100 SF	N/A
33	Drive-in theaters, open stadiums	Sum of TOT_LVG_AR	4 gallons per seat	1 seat/10 SF
39	Hotels, motels	Sum of TOT_LVG_AR	100 gallons per room	1 room/500 SF
40	Vacant Industrial – with/without extra features	0	average current commercial rate	average of current flows/ LND_SQFOOT

DOR UC	Description	Data	Flow Rate	Conversion Factor
41	Light manufacturing, small equipment manufacturing plants, small machine shops, instrument manufacturing, printing plants	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
42	Heavy industrial, heavy equipment manufacturing, large machine shops, foundries, steel fabricating plants, auto or aircraft plants	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
44	Packing plants, fruit and vegetable packing plants, meat packing plants	Sum of TOT_LVG_AR	15 gallons per 100 SF	N/A
48	Warehousing, distribution terminals, trucking terminals, van and storage warehousing	Sum of TOT_LVG_AR	10 gallons per 100 SF	N/A
70	Vacant Institutional, with or without extra features			
71	Churches	Sum of TOT_LVG_AR	4 gallons per seat	1 seat/10 SF
72	Private schools and colleges	Sum of TOT_LVG_AR	10 gallons per student	1 student/30 SF
74	Homes for the aged	Sum of TOT_LVG_AR	100 per hospital bed	225 SF/hospital bed
76	Mortuaries, cemeteries, crematoriums	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
77	Clubs, lodges, union halls	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
80	Vacant Governmental – with/without extra features for municipal, counties, state, federal properties, and water management district (including DOT/State of Florida retention and/or detention areas)	0		
82	Forest, parks, recreational areas	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
83	Public county schools – including all property of Board of Public Instruction	Sum of TOT_LVG_AR	10 gallons per student	1 student/30 SF
86	Counties (other than public schools, colleges, hospitals) including non-municipal government	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
87	State, other than military, forests, parks, recreational areas, colleges, hospitals	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
88	Federal, other than military, forests, parks, recreational areas, hospitals, colleges	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A
89	Municipal, other than parks, recreational areas, colleges, hospitals	Sum of TOT_LVG_AR	5 gallons per 100 SF	N/A

Appendix C

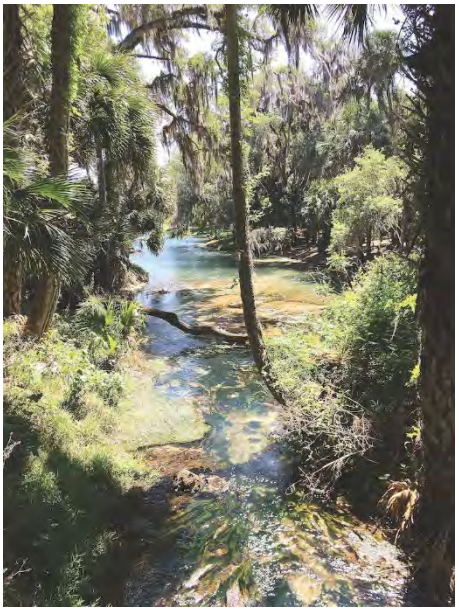
Newspaper Articles

The West Volusia Beacon

April 8, 2021 Al Everson

Mission: Get rid of septic tanks

A major capital project that may take two decades to complete is now in the conceptual stage in DeBary.



A sewage system, whose full cost has not yet been determined, is to be built to connect many, if not most, of the homes and businesses that now rely on septic tanks for waste disposal. Property owners affected by the conversion may have to pay large sums to link up with the system, unless the city can secure outside funding.

The big-ticket effort to save Gemini Springs from an environmental disaster has the force of law behind it, civic leaders say. “There’s no other option. This is a state mandate,” DeBary City Manager Carmen Rosamonda said.

The project area is mostly south of Highbanks Road, where, officials say, septic tanks are overloading the groundwater with nitrogen. “We are working on a strategy to connect 2,300 homes,” Rosamonda said.

DeBary is not alone — many West Volusia cities will ultimately have to contend with improving or getting rid of septic tanks that lie within focus areas near major springs. West Volusia has three designated “Outstanding Florida Springs” — Blue, Gemini, and DeLeon.

DeLeon Springs is currently planning for infrastructure improvements that will connect sewer lines around DeLand to their business corridor.

Ultimately, by 2038, every septic system around a designated spring, in a priority focus area or not, will need to phase out older, traditional septic systems and either replace them with newer, more expensive enhanced aerobic systems, or hook up to a sewage-treatment plant.

Orders from the state

The Florida Department of Environment Protection is ordering the city and the county to reduce the nitrogen load finding its way into the springs in the coming years. The state agency says some 20,496 pounds of nitrogen are now going into the springs from septic tanks and fertilizer each year, and the FDEP is calling for an annual reduction of at least 14,270 pounds.

Nitrogen, biologists warn, promotes the growth and spread of algae and aquatic plants that deprive the water of oxygen and diminish water quality.

DeBary already has in place an ordinance restricting the use of fertilizer, and thus authorities are demanding something be done about the septic tanks believed to be affecting Gemini Springs. Gemini Springs has been polluted for several years. Because of high levels of disease-causing bacteria, swimming has not been allowed in the springs since 1996.

TURFGRASS FERTILIZER IS THE TOP SOURCE — This map shows the area affected by the Gemini Springs Basin Management Action Plan. Most of it is Seminole County, but Gemini Springs is in Volusia County, and the Priority Focus Area, where changes will be required first, is in DeBary. The PFA is shown with an orange border.

The FDEP blames septic tanks for adding a great deal of nitrogen to the springs, and it is calling for the reduction of at least 14,270 pounds of nitrogen by 2038.

“We realize what an incredible task this is,” Volusia County Utilities Director Mike Ulrich said.

Two options for homeowners

The county is heavily involved in the septic-to-sewer conversion, because the county owns and operates the water and wastewater systems inside DeBary”s city limits.

“This is a state mandate. You, the city and the county are on the same side, working together as a whole,” Ulrich told DeBaryites at a Feb. 24 public-information meeting.

Ulrich said DeBary homeowners face two options:

One is to replace a conventional septic tank with an advanced system that reduces nitrogen going into the ground. The installation prices of these aerobic-treatment systems typically range between $12,500 and $17,500. There are recurring expenses including electricity to operate a pump and the costs of inspections.

The other option, Rosamonda said, is to “move to a central sewer system.”

“Central systems work,” Ulrich said. But the cost of such projects is not cheap. Information compiled by the county notes the cost of building and connecting users to a sewer system would be $30,000-$40,000 per home. Is it possible for DeBary and Volusia County to obtain grants from higher levels of government to lower that cost for individual homeowners?

“What we don’t know is the state funding amount,” Ulrich said.

Ulrich added the final amount charged to each homeowner may range between $5,000 and $7,000, but those numbers could be higher.

The individual utility customer’s share of the sewer system’s cost would become a loan — and a lien — whose payment could be stretched out over several years, with interest charged. The annual amount due would appear as a special assessment on property-tax bills.

Rosamonda hopes for better. “We would prefer that the state pay for all of it, as they should,” he said, noting the demand is coming from Tallahassee. “It’s our intention to get the State of Florida to pay as much as possible,” Rosamonda added. “We’ll shoot for 100 percent and see where we’re going.”

Rosamonda said he has talked with legislators about DeBary’s need for help higher up in complying with the FDEP’s order.

https://beacononlinenews.com/2021/04/08/mission-get-rid-of-septic-tanks/

THE DAYTONA BEACH
NEWS-JOURNAL

VOLUSIA

To clean up Gemini Springs, DeBary looking to oust 2,300 septic tanks on state's dime

Katie Kustura The Daytona Beach News-Journal

Published 9:23 p.m. ET Apr. 11, 2021

In less than three months, DeBary must show the state how it plans on cleaning up Gemini Springs where an excessive nitrogen load has been attributed to septic systems and urban turfgrass fertilizer.

And those plans, once established, could take 20 years and more than $50 million to finish, City Manager Carmen Rosamonda said.

"It's another mandate and burden that's put on local governments without any funding," Rosamonda said by phone Friday.

For that reason, he believes the state should cover the cost of removing the 2,000-plus septic tanks in the Gemini Springs priority focus area, which the Department of Environmental Protection defines as "vulnerable areas where pollution sources pose the highest risk due to proximity to a spring and permeable [sandy] soil conditions."

"If we don't partner up, each resident will be required to install a modern advanced-treatment system in their yard," Rosamonda said.

Those decentralized systems, depending on the type, can cost between $10,000 to $20,000 to install with annual inspection and maintenance costs between $250 to $1,500.

The plans, which DeBary is working on with Volusia County and the state, will be submitted to the Department of Environmental Protection by June 30.

Once the plans are approved, the city will begin looking for grants to keep the costs for homeowners minimal, though the hope is that there won't be a cost to residents at all.

"Without a plan, the chance of being able to get any of that money is pretty much nil," Mike Ulrich, water resources and utilities director for Volusia County, said.

Series: Septic tanks leak nitrogen into Florida's springs

Tomoka Marathon's westward pandemic move to Gemini Springs in DeBary a 'blissful' run

The need to devise a plan is a result of the 2016 Florida Springs and Aquifer Protection Act in which the state Legislature identified 30 "Outstanding Florida Springs," one of which is Gemini Springs. In Volusia County, Blue Spring and DeLeon Springs also received that designation.

The Department of Environmental Protection determined that 24 of those 30 springs, including the three in Volusia County, were impaired by excessive nitrate pollution.

The act requires adopting basin management action plans, commonly called BMAPs, to ensure the pollutant levels in the springs are below the established total maximum daily loads. The act also requires adopting strategies to ensure the water levels of the springs don't drop below the established minimum levels.

What's in the water?

In Gemini Springs, where the current nutrient load is about 20,496 pounds per year, urban turfgrass fertilizers account for 46% and septic systems account for 41%.

The nitrogen polluting the springs is leaching into the groundwater, the source of drinking water.

Other contributors include: 5% atmospheric deposition; 4% sports turfgrass fertilizer; 3% wastewater treatment facility; 1% farm fertilizer; and 0.1% livestock waste, according to the Gemini Springs BMAP.

Herb Reed, who lives in the priority focus area, suggested that if there is a cost, every DeBary resident should pay into it, especially since urban turfgrass fertilizer is the bigger pollutant and identifying those who continue to use it isn't feasible.

"They should have some kind of skin in the game, I think," Reed said during a workshop for residents living in the priority focus area.

The City Council in June 2017 adopted an ordinance to address the fertilizer issue.

According to the ordinance:

> No fertilizer in the summer, June through September.
> Fertilizer applied October through May must be at least 50% slow release nitrogen.
> Do not apply phosphorus to your lawn without a soil test.
> Fertilizer must be kept at least 15 feet away from any body of water.
> Fertilizer containing nitrogen or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first 30 days after seeding or sodding.

"We're trying to get compliance through education," Rosamonda said. "We're working on both sides to try and clean up Gemini Springs."

During the workshop for residents in the priority focus area, attendees also heard from Terri Lowery, senior vice president of Jones Edmunds, an engineering and consulting firm.

Lowery said that while Florida residents amount to about 6.5% of the country's population, the state has 12% of the country's septic tanks.

Volusia County has about 90,000 septic tanks, 50,000 of which are in BMAP boundaries, Lowery said. Each tank contributes about 8.2 pounds of nitrogen.

"What we hear a lot is that 'my septic system works fine,' and the truth is that many of the septic systems work fine, but conventional septic systems were not designed to address nutrients," Lowery said. "They were designed for human health protection."

For the future

Lowery said while the Department of Environmental Protection recognizes it's asking a lot, "they put some aggressive goals up front" regarding the amount of nitrogen that should be removed.

By 2038, 14,270 pounds need to be removed.

"It’s not something that’s going to happen overnight," Rosamonda said.

In the process of moving to a central sewer system, Rosamonda anticipates the city will run water lines since the roadways already will be torn up. If residents do hook up to the water lines, they can keep their wells and convert them to be used for irrigation only.

Rosamonda said additional benefits of the water lines would be adding fire hydrants to areas that don't have them, which would help with insurance costs, and if the power goes out, water and sewer won't be affected.

The goal is to take care of the 2,300 homes in the priority focus area during a five-year period, but it could be a rolling plan depending on funding.

"That’s probably the biggest factor in this whole thing is how much money is the state will grant to local government," Rosamonda said. "It's competitive."

He said the plans will likely be finished in May or early June and then presented to the City Council before they're turned over to the state.

THE DAYTONA BEACH
NEWS-JOURNAL

VOLUSIA

Plans to oust 2,300 septic tanks in DeBary include vacuum sewer system, no water lines

Katie Kustura The Daytona Beach News-Journal
Published 5:30 a.m. ET Aug. 16, 2021 | **Updated 11:04 a.m. ET Aug. 16, 2021**

Experts will recommend to the DeBary City Council Wednesday the best way to remove 2,300 septic tanks as required by the state due to their detrimental impact on Gemini Springs.

Local officials say they're hoping the state will pay for the lion's share of the mandate, which could take 20 years and more than $50 million to complete, but the affected homeowners will likely have to pay about $5,000 through an ad valorem assessment.

While the preferred cost to residents would be zero, officials say that scenario unfortunately isn't an option.

"If we do nothing, they will eventually face having to retrofit [their septic systems] and have their own private system at a very high cost based on everything that we know right now," Mike Ulrich, water resources and utilities director for Volusia County, said last week.

Saving the springs: Once pristine waters are slowly being choked by high nitrogen levels from septic tanks

Those systems can cost between $15,000 to $17,000 to install and carry annual inspection and maintenance costs between $250 to $1,500, officials say.

After holding workshops and gathering residents' feedback over the past few months, local officials say the plans will involve removing the septic tanks in phases and installing a vacuum sewer system, also called a pneumatic sewer system.

Vacuum sewer systems "use negative pressure to draw the wastewater from the point of generation to the wastewater treatment plant," according to a report by the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB. Vacuum pumps generate pressure which draws in "atmospheric air through specific air inlets located at the wastewater collection points."

These systems, which have been used in South Florida for several years, have less of an impact on residents from a construction perspective compared to other options, said Terri Lowery, senior vice president of Jones Edmunds, an engineering and consulting firm. They also don't generate complaints regarding odor or noise.

Lowery, who is working with DeBary and Volusia County on the plans, said vacuum sewer systems are becoming more popular, especially as the need to retrofit septic tanks has increased.

"On lots of less than 1 acre, there are no new conventional septic systems allowed within the priority focus area, and you have over 2,000 impacted parcels in your community," Lowery told the DeBary City Council during a workshop last month. "And so there has to be a plan for those existing septic systems to find some alternative for nitrogen reduction, be it a decentralized or centralized system."

The Department of Environmental Protection defines the priority focus areas as "vulnerable areas where pollution sources pose the highest risk due to proximity to a spring and permeable [sandy] soil conditions." Due to the vulnerability of these areas and the damage several state springs already have incurred, new septic systems aren't permitted in these areas.

Going with a centralized system would work best because they are the most cost-effective and reliable long-term, Lowery said. Another reason is aerobic treatment units, which are similar to standard septic systems, are generally too expensive for individual homeowners, and they won't reduce enough of the nutrient load as required by the state.

Required remediation

In 2016, the Legislature identified 30 "Outstanding Florida Springs" in its Florida Springs and Aquifer Protection Act; this resulted in plans to reduce the excessive nitrate pollution in the springs. Twenty-four of those springs, including three in Volusia County, were deemed impaired by the levels of pollution.

Read: Florida Springs and Aquifer Protection Act

The current nutrient load in Gemini Springs is about 20,496 pounds per year, according to the Department of Environmental Protection. Urban turfgrass fertilizers account for 46% and septic systems account for 41%.

And the nitrogen polluting the springs is leaching into the groundwater, the main source of drinking water.

Other contributors include: 5% atmospheric deposition; 4% sports turfgrass fertilizer; 3% wastewater treatment facility; 1% farm fertilizer; and 0.1% livestock waste, according to the Gemini Springs Basin Management Action Plan.

The Springs and Aquifer Protection Act requires BMAPs, as they're commonly called, to ensure the pollutant levels in the springs are below the established total maximum daily loads. Adopting strategies to ensure the water levels of the springs don't drop below the established minimum levels also is required.

There are approximately 90,000-100,000 septic tanks in Volusia County. About 50,000 of those tanks, each of which contributes about 8.2 pounds of nitrogen, are located in BMAP boundaries.

The Department of Environmental Protection wants 14,270 pounds of that nutrient load in Gemini Springs removed by 2038.

"A lot of folks think it's just leaky septic tanks, but it's really not," Ulrich said. "Even a properly working septic tank system still produces ammonia."

A plan for DeLeon Springs also is in the works, and a plan for Blue Spring could be initiated next year, Ulrich said.

The fertilizer dilemma

When it comes to fertilizer, there's only so much local governments can do, Ulrich said.

"It's a difficult thing to enforce," Ulrich said.

DeBary took action on the fertilizer issue in 2017 through an ordinance approved by the City Council.

Education on the ordinance is ongoing, said Carmen Rosamonda, city manager of DeBary.

"Until the state mandates that certain fertilizers cannot be sold in Florida, what we can do is educate our residents on how they can preserve our springs," said Shari Simmans, DeBary's director of economic development, communications and government affairs.

The ordinance states that no fertilizer shall be used during the summer, June through September.

Read: DeBary's ordinance on fertilizer use

Additionally, the ordinance states:

> Fertilizer applied October through May must be at least 50% slow-release nitrogen.
> Do not apply phosphorus to your lawn without a soil test.
> Fertilizer must be kept at least 15 feet away from any body of water.
> Fertilizer containing nitrogen or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first 30 days after seeding or sodding.

Volusia County's fertilizer ordinance, which was approved by the council in 2014, includes the same provisions.

In addition to initiating a program to educate residents on properly using fertilizer, information is included with the city's newsletter, which residents receive on a quarterly basis, Rosamonda said.

City officials and legislators are also discussing possibly prohibiting the sale of certain types of fertilizer in Florida, Rosamonda said.

The summer ban on fertilizer, something municipalities across Florida employ, is concurrent with the state's rainy season, because excessive rainfall can result in fertilizer washing into creeks and ditches and, eventually, the springs.

This can lead to seagrass-killing algal blooms.

And manatees, which feed on seagrass, are starving at record rates, according to the Florida Fish and Wildlife Conservation Commission.

The excess nutrients from fertilizer runoff can also cause fish kills.

State expectations

Ulrich said his goal is to have the Gemini Springs wastewater feasibility analysis report finalized and submitted to the Department of Environmental Protection by the end of September. He hopes to initiate the design work early in the next fiscal year.

Reports on Gemini and DeLeon Springs were initially due to the Florida Department of Environmental Protection on June 30, but a nine-month extension was secured as the coronavirus pandemic impeded the process.

Once the plans are approved, local officials may begin looking for grants to keep the cost to homeowners minimal.

"All available grants will be pursued, but none are guaranteed," Tony Hairston, vice president of Raftelis, a local government and utilities consulting firm, said during the July 14 workshop.

Prior to the workshop, the parties had hoped to include adding water lines, but officials say they didn't receive enough interest from the affected residents who are on well water.

If water lines were to be included, the predicted cost to residents would increase to about $15,000, Ulrich said.

Buy-in from the community is one factor the state considers in reviewing grant applications, Lowery said. Also considered is the local financial commitment.

In an earlier workshop, resident Herb Reed, who lives in the priority focus area, suggested that every resident should pay into the cost as urban turfgrass fertilizer is the bigger nutrient contributor and figuring out just which residents to point the finger at isn't really feasible.

"They should have some kind of skin in the game, I think," Reed said.

Rosamonda said the goal is to take care of those 2,300 homes within five years, but achieving it will depend on funding.

THE DAYTONA BEACH
NEWS-JOURNAL

ENVIRONMENT

DeBary City Council approves plan to remove 2,300 septic tanks impacting Gemini Springs

Katie Kustura The Daytona Beach News-Journal

Published 12:17 p.m. ET Aug. 25, 2021 | **Updated 12:24 p.m. ET Aug. 25, 2021**

The DeBary City Council approved the plan detailing how to remove 2,300 septic tanks that have contributed to the pollution of Gemini Springs.

The 54-page Gemini Springs Wastewater Treatment Feasibility Analysis report, which received unanimous support at the Aug. 18 meeting, was an effort of Jones Edmunds, an engineering and consulting firm; Volusia County Water Resources and Utilities; and the City of DeBary.

"It's been a long journey," Carmen Rosamonda, city manager of DeBary, said during the special council meeting.

Removing the 2,300 tanks in phases and providing the affected residents with a vacuum sewer system could take 20 years and more than $50 million to complete.

Money for the mandate: To clean up Gemini Springs, DeBary looking to oust 2,300 septic tanks on state's dime

"Our work is really just beginning," Mike Ulrich, water resources and utilities director for Volusia County, said.

While the council's approval includes authorizing the city manager to make minor corrections to wording if necessary, there likely won't be any significant changes to the report between the council's vote and when it's submitted to the Department of Environmental Protection by the end of next month.

"I appreciate the in-depth amount of time we spent on this, trying to make this as painless as possible," Councilmember William Sell said. "It’s a big deal to me, and it affects my neighbors who are mostly on a fixed income."

For the residents who will eventually bid farewell to their septic tanks, the price of connecting to the proposed vacuum sewer system is estimated at $5,000.

The cost, which will appear on the property tax assessment, can be assessed up to 20 years, and with a 2% interest rate, would be about $317 per year or $26 monthly, said Shari Simmans, DeBary's director of economic development, communications and government affairs. Homeowners will also be responsible for sewer services, which cost $48 per month.

Officials hope the state and available grants will cover the rest of the $50 million price tag.

Once the plan gets the Department of Environmental Protection's stamp of approval, the project's design will go out for bid.

Designing and engineering the project could take a year to 18 months, Ulrich said.

Brian Icerman, senior vice president and managing director for utilities infrastructure with Jones Edmunds, said the state likes seeing projects that are "shovel-ready."

"The sooner you get started with that piece, the higher likelihood you're going to get money from the state," Icerman said.

Asked about how soon the physical construction work could begin, Icerman said breaking ground by 2023 isn't unrealistic.

Councilmember Patricia Stevenson said she feels like she's been part of a group project for school and, now, the group is waiting to find out their grade.

"I think through the process of speaking with citizens and educating them that this really was the best financial decision we could make for our town," Stevenson said. "This is going to save homeowners money, and it's going to meet the goals for improving our environment."

Special Report: Volusia’s septic tank crisis

Leaking nitrogen: Once pristine waters are slowly being choked by high nitrogen levels brought on by septic systems

Florida's expectations on cleaning up pollution in springs

The mandate to clean up Gemini Springs came in 2016 when the Legislature identified 30 "Outstanding Florida Springs" in the Florida Springs and Aquifer Protection Act.

Twenty-four of those springs, including Gemini, DeLeon Springs and Blue Spring, were declared impaired from the levels of pollution.

The Department of Environmental Protection wants more than 14,000 pounds of that nutrient load in Gemini Springs removed by 2038.

The current nutrient load in Gemini Springs is about 20,496 pounds per year, according to the Department of Environmental Protection. Urban turfgrass fertilizers account for 46% and septic systems account for 41%.