Public Works
Department

650 Old Dixie Highway
Lake Park, FL 33403
Phone: (561) 881-3345
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www.lakeparkflorida.gov

March 29, 2021

Florida Department of Environmental Protection
NPDES Stormwater Program
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000
Attention: Stephen Cioccia, MS4 Coordinator

Re: Town of Lake Park, Florida NPDES MS4 Permit Cycle 4, Year 4 Annual Report & MS4 reapplication

Dear Mr. Cioccia:

Please find the attached Town of Lake Park NPDES MS4 Cycle 4, Year 4 Annual Report (AR). The AR includes a statement of reapplication for reissuance/renewal and the additional information required in Year 4 of the cycle.

A draft of the AR was previously submitted to Mock Roos for review. This final version, dated March 29, 2021, includes all the suggested corrections.

The responses to the reapplication requirements reference the attached Town of Lake Park MS4 Stormwater Master Plan Assessment Program Annual Results Report dated March 29, 2021.

As stated in the AR and the Assessment Program Annual Results Report, the Town of Lake Park is excited to implement the recommendation for the Town's 2020 Stormwater Masterplan Update consisting of Green Infrastructure-based Best Management Practices. The programmatic 20-year CIP implementation will greatly enhance the Town's MS4 program and reduce pollutant loadings to the Lake Worth Lagoon.

I trust this submittal meets and complies with the Palm Beach County Group/State of Florida NPDES/MS4 F.A.C. Requirements – MS4 Permit Yr. 4 Renewal/Reapplication. Please contact me if you have any questions.

Regards,

Dwayne Bell, Sr., Operations Manager / Interim Public Works Director

Annual Report Form

For Individual NPDES Permits For Municipal Separate Storm Sewer Systems (RULE 62-624.600(2), F.A.C.)

Final 03/29/2021

- This Annual Report Form must be completed and submitted to the Department to satisfy the annual reporting requirements established in Rule 62-621.600, F.A.C.
- Submit this fully completed and signed form and any REQUIRED attachments by email to the NPDES Stormwater Program Administrator or to the MS4 coordinator (http://www.dep.state.fl.us/water/stormwater/npdes/contacts.htm). Files larger than 10MB may be placed on the FTP site at: ftp://ftp.dep.state.fl.us/pub/NPDES_Stormwater/. After uploading files, email the MS4 coordinator or NPDES Program Administrator to notify them the report is ready for downloading; or by mail to the address in the box at right.
- Refer to the Form Instructions for guidance on completing each section.
- **Please print or type information in the appropriate areas below.**

Submit the form and attachments to:
Florida Department of Environmental Protection
Mail Station 3585
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

SECTION I. BACKGROUND INFORMATION

A.	Permittee Name: Town of Lake Park		
B.	Permit Name: Palm Beach County		
C.	Permit Number: FLS000018-004		
D.	Annual Report Year: ☐ Year 1 ☐ Year 2 ☐ Year 3 ☒ Year 4 ☐ Year 5 ☐ Other, specify Year:		
E.	Reporting Time Period (month/year): 10 / 2019 through 09 / 2020		
F.	Name of the Responsible Authority: John D'Agostino		
	Title: Town Manager		
	Mailing Address: 535 Park Avenue		
	City: Town of Lake Park	Zip Code: 33404	County: Palm Beach
	Telephone Number: 561-881-3304	Fax Number: 561-881-3314	
	E-mail Address: Townmanager@lakeparkflorida.gov		
G.	Name of the Designated Stormwater Management Program Contact (if different from Section I.F above): Dwayne Bel		
	Title: Public Works Director (Interim)		
	Department: Public Works		
	Mailing Address: 650 Old Dixie Highway		
	City: 650 Old Dixie Highway	Zip Code: 33404	County: Palm Beach
	Telephone Number: 650 Old Dixie Highway	Fax Number: 561-881-3349	
	E-mail Address: dbell@lakeparkflorida.gov		

SECTION II. MS4 MAJOR OUTFALL INVENTORY (Not Applicable in Year 1)

A.	Number of outfalls ADDED to the outfall inventory in the current reporting year (insert "0" if none): (Does this number include non-major outfalls? ☐ Yes ☐ No ☒ Not Applicable)
B.	Number of outfalls REMOVED from the outfall inventory in the current reporting year (insert "0" if none): (Does this number include non-major outfalls? ☐ Yes ☐ No ☒ Not Applicable)
C.	Is the change in the total number of outfalls due to lands annexed or vacated? ☐ Yes ☐ No ☒ Not Applicable

SECTION III.	PART V.B. ASSESSMENT PROGRAM
A.	Provide a brief statement as to the status of water quality monitoring plan implementation. Status may include sampling frequency changes, monitoring location changes, or sampling waiver conditions. *DEP Note: If permittee participates in a collaborative monitoring plan, permittee may refer to a joint response as defined by the interlocal agreement.* Name and date of the approved plan: Town of Lake Park Cycle 4, MS4 Assessment Plan (Approved by FDEP on 2/24/2021) Status: The Cycle 4, year 4 water quality monitoring program has been updated to reflect the proposed use of Green Infrastructure Best Management Practices (BMP's) such as bioswales, biodetention, bioretention as part of the Town of Lake Park 2020 Stormwater Masterplan update. It is expected that Town-wide implementation of roadside bioswales will reduce pollutant loadings to the Lake Worth Lagoon. Monitoring sampling location #1 will now reflect proposed bioswales along 2nd Street. Additionally, monitoring sampling location #2 has been proposed for relocation to better address runoff discharges and pollutants loads from the US Highway 1 right-of-way.
B.	Provide a brief discussion of the monitoring and loading results to date which includes a summary of the water quality monitoring data and / or stormwater pollutant loading changes from the reporting year. *DEP Note: Results must be specific to the permittee's SWMP.* Water quality monitoring data was very consistent with the previous reporting year for all parameters (Chl-a, TN, TP and TSS). A pattern was observed with Chl-a and TN at sampling location #4. There appears to be periodic spikes of these parameters representative of loading discharges from a system of stormwater lakes along Congress Avenue. These area is characterized by significant commercial development, parking lots, and landscaped sites including Aldi, and Culverts. It is very likely that excessive fertilizer application and parking lot runoff contributes to the spikes. It was observed that the spikes correlate well with storm events of 1 to 2 inches. The Town of Lake Park is in the process of performing model simulations of proposed bioswales and biodetention in various parts of the Town. These results will be provided in an update of the MS4 Stormwater Masterplan Assessment Program Annual Results Report presented in February 24, 2021.
C.	Attach a monitoring data summary as required by the permit. An analysis of the data discussing changes in water quality and/or stormwater pollutant loading from previous reporting years. *DEP Note: Analysis must be specific to the permittee's SWMP.* The monitoring data summary required by the permit is provided in the Town's 2019-2020 Annual Assessment Report

SECTION IV.	FISCAL ANALYSIS
A.	Total expenditures for the NPDES stormwater management program for the current reporting year: $876,643
B.	Total budget for the NPDES stormwater management program for the subsequent reporting year: $953,918
C.	Did the current reporting year resources decrease from the previous year? Y☐ / N☒ If program resources decreased, provide a discussion of the impacts on the implementation of the SWMP. *N/A*

SECTION V. MATERIALS TO BE SUBMITTED WITH THIS ANNUAL REPORT FORM

Only the following materials are to be submitted to the Department along with this fully completed and signed Annual Report Form (check the appropriate box to indicate whether the item is attached or is not applicable):

Attached	N/A	Required Attachments	Permit Citation	Attachment Number/Title
☐	☒	Any additional information required to be submitted in this current annual reporting year in accordance with Part III.A of your permit that is not otherwise included in Section VII below.	Part III.A	
☐	☒	An explanation of why the minimum inspection frequency in Table II.A.1.a. was not met, if applicable.	Part II.A.1	
☐	☒	A list of the flood control projects that did not include stormwater treatment and an explanation for each of why it did not (if applicable).	Part III.A.4	
☒	☐	A monitoring data summary as directed in Section III.C above and in accordance with Rule 62-624.600(2)(c), F.A.C.	Part V.B.3	See the Town's 2019-2020 Annual Assessment Report
☐	☒	YEAR 1 ONLY: An inventory of all known major outfalls and a map depicting the location of the major outfalls (hard copy or CD-ROM) in accordance with Rule 62-624.600(2)(a), F.A.C.	Part III.A.1	
☐	☒	YEAR 2: A summary review of codes and regulations to reduce the stormwater impact from development.	Part III.A.2	
☐	☒	Year 3 ONLY: The estimates of pollutant loadings and event mean concentrations for each major outfall or each major watershed in accordance with Rule 62-624.600(2)(b), F.A.C.	Part V.A	
☐	☐	YEAR 3: Summary of TMDL Monitoring Results (if applicable).	Part VIII.B.2	
☐	☒	YEAR 3: Bacteria Pollution Control Plan (if applicable).	Part VIII.B.3	
☐	☒	YEAR 4: A follow-up report on plan implementation of changes to codes and regulations to reduce the stormwater impact from development.	Part III.A.2	See Attachments
☐	☒	YEAR 4: A report on any amendments to the applicable legal authority (if applicable).	Part III.A.7.a	No Amendments
☐	☒	YEAR 4: Permit re-application information in accordance with Rule 62-624.420(2), F.A.C. • The monitoring plan (with revisions, if applicable). • If the total annual pollutant loadings have not decreased over the past two permit cycles, revisions to the SWMP, as appropriate.	Part V.B.3 Part V.A.3	Refer to Town of Lake Park Cycle 4 Annual Joint report
☐	☒	YEAR 4: TMDL Supplemental SWMP (if applicable).	Part VIII.B.3	

DO NOT SUBMIT ANY OTHER MATERIALS
(such as records and logs of activities, monitoring raw data, public outreach materials, etc.)

SECTION VI. CERTIFICATION STATEMENT AND SIGNATURE

The Responsible Authority listed in Section I.F above must sign the following certification statement, as per Rule 62-620.305, F.A.C:

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 gathered and evaluated the information submitted. Based upon 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 of Responsible Authority (type or print): John D'Agostino

Title: Town Manager

Signature: _____ Date: 3/29/2021

SECTION VII.	STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE								
A.	**B.**						**C.**	**D.**	**E.**	**F.**
Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**						**Number of Activities Performed**	**Documentation /Record**	**Entity Performing theActivity**	**Comments**
Part III.A.1	**Structural Controls and Stormwater Collection Systems Operation**									
	Report the current known inventory. Report the number of inspection and maintenance activities conducted for each applicable type of structure included in Table II.A.1.a, and the percentage of the total inventory of each type of structure inspected and maintained. *Note: Delete structures that are not in your MS4's inventory. The permittee may choose its own unit of measurement for each structural control to be consistent with the unit of measurement in the documentation. Unit options include: miles, linear feet, acres, etc.*									
	Type of Structure	**Number of Structures**	**Number of Inspections**	**Percent Inspected**	**Number of Maintenance Activities**	**Percent Maintained**				
	Dry retention systems	1	1	100	0	0		Insp Reports	Public Works	
	Exfiltration trench / French drains (lf)	2497'	831'	33.28	831'	33.28		Insp Reports	Public Works	Cleaned
	Grass treatment swales (miles)	183040	189	10.7	19593	10.7		Insp Reports	Public Works	Regrade/Sod
	Dry detention systems	7	7	100	7	1000		Insp Reports	Public Works	
	Detention with filtration systems	32	6	18.75	6	18.75		Insp Reports	Public Works	Exfiltration. Structures
	Major outfalls	13	13	100	11	100		Insp Reports	Public Works	Remove Barnacles
	Weirs or other control structures	5	5	100	5	100		Insp Reports	Public Works	5 Weir Structures.
	pipes / culverts (miles)	9.94	10.4	10.5	1.18	11.9		Insp Reports	Public Works	See note 1
	Inlets / catch basins / grates	522	119	22.8	119	22.8		Insp Reports	Public Works	Cleaned
	Ditches / conveyance swales (miles)	34.6	3.71	10.7	189			Insp Reports	Public Works	Inspected
	If the minimum inspection frequencies set forth inTable II.A.1.a. were not met, provide as an attachment an explanation of why they were not and a description of the actions that will be taken to ensure that they will be met.	☒ **Note 1:** 11.9% of the system was cleaned with a jet/vacuum truck								

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Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**	**Number of Activities Performed**	**Documentation / Record**	**Entity Performing the Activity**	**Comments**
Part III.A.1 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Structural controls have been inspected and maintained on a regular basis and have been found to be functioning as designed				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
Part III.A.2	**Areas of New Development and Significant Redevelopment**				
	Report the number of significant development projects, including new and redevelopment, reviewed and approved by the permittee for post-development stormwater considerations.				
	Number of significant development projects reviewed	1	Comments	Consultant/Staff	See Attachments
	Number of significant development projects approved	1	Approval Letter	Consultant/Staff	See Attachments
	Provide in the Year 2 Annual Report the summary report of the review activity. Provide in the Year 4 Annual Report the follow-up report on plan implementation.				
	Year 2 ONLY: Attach the summary report of the review activity				
	Year 4 ONLY: Attach the follow-up report on plan implementation	[x]	Technical Report	Consultant	See Annual Report
Part III.A.2 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Review of proposed site plans by Stormwater Masterplan consultant to assure compliance with new GI/LID-based SWMP				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
Part III.A.3	**Roadways**				
	Report on the litter control program, including the frequency of litter collection, an estimate of the total number of road miles cleaned or amount of area covered by the activities, and an estimate of the quantity of litter collected. *Note: If the permittee does not contract activities, delete CONTRACTOR activities.*				
	PERMITTEE Litter Control: Frequency of litter collection	Weekly	Coll. Reports	Public Works	
	PERMITTEE Litter Control: Estimated amount of area maintained (lf)	39.55 Ac	Coll. Reports	Public Works	20 Locations Road ROW's & Parks
	PERMITTEE Litter Control: Estimated amount of litter collected (cy)	209.87	Coll. Reports	Public Works	
	CONTRACTOR Litter Control: Frequency of litter collection	Weekly	Coll. Reports	Town Landscape Maint Contractor	
	CONTRACTOR Litter Control: Estimated amount of area maintained (lf)	11.09 acres	Coll. Reports	Town Landscape Maint Contractor	
	CONTRACTOR Litter Control: Estimated amount of litter collected (cy)	17.63	Coll. Reports	Town Landscape Maint Contractor	
	OPTIONAL: If an Adopt-A-Road or similar program is implemented, report the total number of road miles cleaned and an estimate of the quantity of litter				

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Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**	**Number of Activities Performed**	**Documentation / Record**	**Entity Performing theActivity**	**Comments**
	collected. If you do not participate in an Adopt-A-Road program, report "0". N/A				
	Trash Pick-up Events: Total miles cleaned	0			
	Trash Pick-up Events: Estimated amount of litter collected (cy)	0			
	Adopt-A-Road: Total miles cleaned	0			
	Adopt-A-Road: Estimated amount of litter collected (cy)	0			
	Report on the street sweeping program, including the frequency of the sweeping, total miles swept, an estimate of the quantity of sweepings collected, and the total nitrogen and total phosphorus loadings that were removed by the collection of sweepings. If no street sweeping program is implemented, provide the explanation of why not in column F.				
	Frequency of street sweeping	Monthly	Sweeper Logs	Public Works	
	Total miles swept	70	Sweeper Logs	Public Works	
	Estimated quantity of sweeping material collected (cy / tons)	27.39	SWA Receipts	Public Works	Dry
	Total phosphorous loadings removed (pounds)	25	FSA Calculator	Public Works	Dry
	Total nitrogen loadings removed (pounds)	38	FSA Calculator	Public Works	Dry
	Report the equipment yards and maintenances shops that support road maintenance activities, and the number of inspections conducted for each facility.				
	Name of Facility	**Number of Inspections**			
	Public Works Maintenance Yard/640 Old Dixie Hwy Lake Park, FL 33403	12	Insp. Records	Public Works	
Part III.A.3 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Regular maintenance of roadways via street sweeping and litter collection programs				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
Part III.A.4	**Flood Control Projects**				
	Report the total number of flood control projects that were constructed by the permittee during the reporting period and the number of those projects that did NOT include stormwater treatment. The permittee shall provide a list of the projects where stormwater treatment was not included with an explanation for each of why it was not. Report on any stormwater retrofit planning activities and the associated implementation of retrofitting projects to reduce stormwater pollutant loads from existing drainage systems that do not have treatment BMPs.				
	Flood control projects completed during the reporting period	**0**	**0**	Public Works	CIP GI/LID Program
	Flood control projects completed that did not include stormwater treatment	0	0	Public Works	CIP GI/LID Program
	Stormwater retrofit projects planned/under construction	0	CIP	Public Works	CIP Renewal Program
	Stormwater retrofit projects completed	0	CIP	Public Works	CIP Renewal Program
	If there were projects that did not include stormwater treatment, provide as an attachment a list of the projects and an explanation for each of why it did not.	☐	CIP	Public Works	CIP Renewal Program

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Part III.A.4 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Flood control devices perform adequately				
	Limitations: Old infrastructure is approaching useful life expectancy (CIPP program recommended and programmed in SWMP 2010 Update)				
	SWMP revisions implemented to address limitations: Currently updating Stormwater Masterplan based on Green Infrastructure BMP's				
Part III.A.5	**Municipal Waste Treatment, Storage, and Disposal Facilities Not Covered by an NPDES Stormwater Permit**				
	Report the applicable facilities and the number of the inspections conducted for each facility.				
	Name of Facility	**Number of Inspections**			
	Public Works Maintenance Yard, 640 Old Dixie Hwy, Town of Lake Park, FL.	12	Inspection reports	Vehicle Maintenance Foreman	One Location
Part III.A.5 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: The Town's maintenance yard is inspected on a monthly basis				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				
Part III.A.6	**Pesticides, Herbicides, and Fertilizer Application**				
	Report the number of permittee personnel applicators and contracted commercial applicators of pesticides and herbicides who are FDACS certified / licensed. Report the number of permittee personnel who have been trained through the Green Industry BMP Program and the number of contracted commercial applicators of fertilizer who are FDACS certified / licensed.				
	PERSONNEL: FDACS public applicators of pesticides/herbicides	1	State License	FDACS	
	CONTRACTORS: FDACS commercial applicators of pesticides/ herbicides	1	Certificate	IFAS	
	PERSONNEL: Green Industry BMP Program training completed	1	State License	FDACS	
	CONTRACTORS: FDACS certified / licensed applicators of fertilizer	1	State License	FDACS	
	Provide a copy of the adopted ordinance with the Year 2 Annual Report. If this provision is not applicable because the permittee is not within the watershed of a nutrient-impaired water body, indicate that in Column F.				
	Year 2 ONLY: Attach copy of adopted Florida-friendly ordinance	☐			
	Report on the public education and outreach activities that are performed or sponsored by the permittee within the permittee's jurisdiction to encourage citizens to reduce their use of pesticides, herbicides and fertilizers including the type and number of activities conducted, the type and number of materials distributed, and the number of Web site visits (if applicable).				
	Public Education and Outreach Program	The public outreach and education plan is carried out as a joint effort by the Palm Beach County Co-permittees. Please see the Palm Beach County Joint Annual Report for the public education and outreach information. All activities listed here are in addition to PBCJAR.			
	Brochures/Flyers/Fact sheets distributed	1591	**Brochure/Flyers Fact Sheets**	Public Works	**Distribution in addition to PBC Annual Report**
	Neighborhood presentations: Number conducted	0	0	0	0
	Neighborhood presentations: Number of participants	0	0	0	0

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	Newspapers & newsletters: Number of articles/notices published	5	Newsletter	Public Works	**Distribution in addition to PBC Annual Report**
	Newsletters: Number of newsletters distributed	16236	Newsletter	Public Works	**Distribution in addition to PBC Annual Report**
	Public displays (e.g., kiosks, storyboards, posters, etc.)	68	Photograph	Public Works	Posters at Marina, Town Hall, Library
	Special events: Number conducted	6	Email	Library/Public Works	Charismas/Family Health & Safety Expo/Florida Gov
	Special events: Number of participants	1813	Email	Library/Public Works	
	Number of visitors to stormwater-related pages	0			
Part III.A.6 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Applicators are licensed to perform service				
	Limitations: None				
	SWMP revisions implemented to address limitations: Increase staff training				
Part III.A.7.a	**Illicit Discharges and Improper Disposal — Inspections, Ordinances, and Enforcement Measures**				
	Report amendments in Year 4.				
	Year 4 ONLY: Attach a report on amendments to applicable legal authority	☐			
Part III.A.7.c	**Illicit Discharges and Improper Disposal — Investigation of Suspected Illicit Discharges and/or Improper Disposal**				
	Report on the proactive inspection program, including the number of inspections conducted by the permittee, the number of illicit activities found, and the number and type of enforcement actions taken.				
	Proactive inspections for suspected illicit discharges	126	Insp Reports	Public Works	Inlets/Catch Basins Inspections
	Illicit discharges found during a proactive inspection	2	Insp Reports	Public Works	Reported to Code Enf.
	NOV/WL/citation/fines issued for illicit discharges found during proactive inspection	1	Insp Reports	Public Works	Code Compliance Officer/Courtesy Note Posted
	Report on the reactive investigation program as it relates to responding to reports of suspected illicit discharges, including the number of reports received, the number of investigations conducted, the number of illicit activities found, and the number and type of enforcement actions taken.				
	Reports of suspected illicit discharges received	0	Log	Public Works	Code Compliance
	Reactive investigations of reports of suspected illicit discharges etc.	0	Log	Public Works	Code Compliance
	Illicit discharges etc. found during reactive investigation	0	Log	Public Works	Code Compliance

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	NOV/WL/citation/fines issued for illicit discharges etc. found during reactive investigation	0	Insp. Reports	Public Works	Compliance
	Report the type of training activities, and the number of permittee personnel and contractors trained (both in-house and outside training) within the reporting year. (See Statements)				
	Personnel trained	23	Annual NPDES Training Sign In	Palm Beach County NPDES	In House Virtual Training
	Contractors trained	0	Annual NPDES Training Sign In	Palm Beach County NPDES	In House Virtual Training
Part III.A.7.d	**Illicit Discharges and Improper Disposal — Spill Prevention and Response**				
	Report on the spill prevention and response activities, including the number of spills addressed.				
	Hazardous and non-hazardous material spills responded to	0	Insp. Reports	Fire Dept.	Incident Report
	Report the type of training activities, and the number of permittee personnel and contractors trained (both in-house and outside training) within the reporting year.				
	Personnel trained	23	Annual NPDES Training Sign In	Palm Beach County NPDES	In House Virtual Training
	Contractors trained	0	Annual NPDES Training Sign In	Palm Beach County NPDES	In House Virtual Training
Part III.A.7.e	**Illicit Discharges and Improper Disposal — Public Reporting**				
	Report on the public education and outreach activities that are performed or sponsored by the permittee within the permittee's jurisdiction to encourage the public reporting of suspected illicit discharges and improper disposal of materials, including the type and number of activities conducted, the type and number of materials distributed, and the number of Web site visits (if applicable).				
	Public Education and Outreach Program	The public outreach and education plan is carried out as a joint effort by the Palm Beach County Co-permittees. Please see the Palm Beach County Joint Annual Report for the public education and outreach information.			
	Brochures/Flyers/Fact sheets distributed	1591	Brochure	Public Works	
	Newspapers & newsletters: Number of articles/notices published	5	Newsletter	Public Works	
	Newsletters: Number of newsletters distributed	16236	Newsletter	Public Works	
	Public displays (e.g., kiosks, storyboards, posters, etc.)	68	Newsletter	Public Works	
	Special events: Number conducted	6	Email	Library/ PWD	
	Special events: Number of participants	1830	0	Library/ PWD	
	Number of visitors to stormwater-related pages	0	0	0	Undetermined

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Part III.A.7.f	**Illicit Discharges and Improper Disposal — Oils, Toxics, and Household Hazardous Waste Control**				
	Report on the public education and outreach activities that are performed or sponsored by the permittee within the permittee's jurisdiction to encourage the proper use and disposal of oils, toxics, and household hazardous waste, including the type and number of activities conducted, the type and number of materials distributed, the amount of waste collected / recycled / properly disposed, and the number of Web site visits (if applicable).				
	Public Education and Outreach Program	The public outreach and education plan is carried out as a joint effort by the Palm Beach County Co-permittees. Please see the Palm Beach County Joint Annual Report for the public education and outreach information.			
	Brochures/Flyers/Fact sheets distributed	1591	Brochure	Public Works	
	Neighborhood presentations: Number conducted	0			
	Neighborhood presentations: Number of participants	0			
	Newspapers & newsletters: Number of articles/notices published	5	Newsletter	Public Works	
	Newsletters: Number of newsletters distributed	16236	Newsletter	Public Works	
	Public displays (e.g., kiosks, storyboards, posters, etc.)	68	Newsletter	Public Works	
	Radio or television Public Service Announcements (PSAs)	0			
	School presentations: Number conducted	0			
	School presentations: Number of participants	0			
	Seminars/Workshops: Number conducted	0			
	Seminars/Workshops: Number of participants	0			
	Special events: Number conducted	6	Email	Library/ PWD	
	Special events: Number of participants	1830		Library/ PWD	
	Storm sewer inlets newly marked/replaced	0			
	Number of visitors to stormwater-related pages	0			
Part III.A.7.g	**Illicit Discharges and Improper Disposal — Limitation of Sanitary Sewer Seepage**				
	Report on the type and number of activities undertaken to reduce or eliminate SSOs and inflow/ infiltration, the number of SSOs or inflow / infiltration incidents found, and the number resolved, and the name of the owner of the sanitary sewer system within the permittee's jurisdiction. Report only the SSOs and inflow / infiltration incidents into the MS4. (N/A)				
	Owner of the sanitary sewer system	Seacoast Utility Authority			
	Activity to reduce/eliminate SSOs and I&I: (description)	0	Seacoast Records	Seacoast Utilities	Email
	Activity to reduce/eliminate SSOs and I&I: (description)	0	Seacoast Records	Seacoast Utilities	Sent
	SSO incidents discovered	0	Seacoast Records	Seacoast Utilities	Regarding
	SSO incidents resolved	0	Seacoast Records	Seacoast Utilities	Illicit
	Inflow / infiltration incidents discovered	0	Seacoast Records	Seacoast Utilities	Incident
	Inflow / infiltration incidents resolved	0	Seacoast Records	Seacoast Utilities	

SECTION VII.	STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
A.	**B.**			**C.**	**D.**	**E.**	**F.**
Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**			**Number of Activities Performed**	**Documentation / Record**	**Entity Performing the Activity**	**Comments**
Part III.A.7 Summary	For activities required by Part III.A.7: Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.						
	Strengths: Staff performs regular inspections via pipe/inlet cleaning and CCTV inspections program						
	Limitations: SWMP Update addresses the need for additional CCTV equipment for FY2021						
	SWMP Revisions implemented to address limitations: Budget increase for additional CCTV inspection of stormsewer lines recommended						
Part III.A.8.a	**Industrial and High-Risk Runoff — Identification of Priorities and Procedures for Inspections**						
	Report on the high-risk facilities inventory, including the type and total number of high-risk facilities and the number of facilities newly added each year.						
	Report on the high-risk facilities inspection program, including the number of inspections conducted and the number and type of enforcement actions taken.						
	Type of Facility	**Number of Facilities**	**Number of Inspections**	**Enforcement Actions**			
	Operating municipal landfills	0	0	0	SOP	Public Works	FDEP Website/ Solid Waste
	Hazardous waste treatment, storage, disposal, and recovery (HWTSDR) facilities	**2**	2	2	Insp reports (See attachment)	Public Works (See attachment)	Copy of report sent to Public Works Director
	EPCRA Title III, Section 313 facilities (TRI)	0	0	0			
Part III.A.8.b	**Industrial and High-Risk Runoff — Monitoring for High-Risk Industries**						
	Report the number of high-risk facilities sampled.						
	High risk facilities sampled			0	SOP	Public Works	Copy of Report
Part III.A.8 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.						
	Strengths: Staff performs regular inspections of facilities.						
	Limitations: None						
	SWMP revisions implemented to address limitations: SWMP update addresses additional SWMP O&M needs for FY2021						
Part III.A.9.a	**Construction Site Runoff — Site Planning and Non-Structural and Structural Best Management Practices**						
	Report the number of permittee and private pre-construction site plans reviewed for stormwater, erosion, and sedimentation controls, and the number approved.						
	PERMITTEE SITES: Construction site plans reviewed			0			
	PERMITTEE SITES: Construction site plans approved			0			
	PRIVATE SITES: Construction site plans reviewed			1	Const. Site Plan Application	Comm Dvlp Staff	(See attachment)
	PRIVATE SITES: Construction site plans approved			1	Approval Letter	Comm Dvlp Staff	(See attachment)

SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE					
A.	**B.**	**C.**	**D.**	**E.**	**F.**
Permit Citation/ SWMP Element	**Permit Requirement/Quantifiable SWMP Activity**	**Number of Activities Performed**	**Documentation / Record**	**Entity Performing the Activity**	**Comments**
	Report the number of development permit applicants notified of the ERP and CGP, and the number of applicants who confirmed ERP and CGP coverage.				
	Notified of ERP stormwater permit requirements	0			
	Confirmed ERP coverage	0			
	Notified of CGP stormwater permit requirements	1	Comments Letters	Comm Dvlp Staff	(See attachment)
	Confirmed CGP coverage	1	SFWMD	Comm Dvlp Staff	(See attachment)
Part III.A.9.b	**Construction Site Runoff — Inspection and Enforcement**				
	Report on the inspection program for privately-operated and permittee-operated construction sites, including the number of active construction sites during the reporting year, the number of inspections of active construction sites, the percentage of active construction sites inspected, and the number and type of enforcement actions / referrals taken.				
	PERMITTEE SITES: Active construction sites	0	Land Development	Planning Department	
	PERMITTEE SITES: Pre-, During, and Post inspections of active construction sites for E&S and waste control BMPs	0		Planning Department	
	PERMITTEE SITES: Percentage of active construction sites inspected	0			
	PRIVATE SITES: Active construction sites	1	Photos	Planning Department Consultant	Const. Ongoing
	PRIVATE SITES: Pre-, During, and Post inspections of active construction sites for E&S and waste control BMPs	1	Photos	Planning Department Consultant	Inspections to be completed in YR4
	PRIVATE SITES: Percentage of active construction sites inspected	100	Commission Minutes	Public Works Department	(See attachment)
	Enforcement Action	0			
Part III.A.9.c	**Construction Site Runoff — Site Operator Training**				
	Report the type of training activities, the number of inspectors, site plan reviewers and site operators trained (both in-house and outside training).				
		DEP Certification	**Annual Training**		
	Permittee construction site inspectors	**2**	2	FSA NPDES Training	Public Works
	Permittee construction site plan reviewers		2	FSA NPDES Training	Public Works
	Permittee construction site operators		2	FSA NPDES Training	Public Works
Part III.A.9 Summary	Provide an evaluation of the Stormwater Management Program according to Part VI.B.2 of the permit.				
	Strengths: Staff and consultants perform regular inspections to ensure maintenance of pollution prevention devices.				
	Limitations: None				
	SWMP revisions implemented to address limitations: None				

SECTION VIII. CHANGES TO THE STORMWATER MANAGEMENT PROGRAM (SWMP) ACTIVITIES (Not Applicable in Year 4)		
A.	**Permit Citation/ SWMP Element**	**Proposed Changes to the Stormwater Management Program Activities Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change) — REQUIRES DEP APPROVAL PRIOR TO CHANGE IF PROPOSING TO REPLACE OR DELETE AN ACTIVITY.**
		SWMP 2020 update recommendations included a second crew for O&M of Green Infrastructure to be constructed. Crew will be created in FY2022 when.
		GI/LID improvements come on line
B.	**Permit Citation/ SWMP Element**	**Changes to the Stormwater Management Program Activities NOT Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change)**
		None

SECTION IX. TMDL Status Report

A. YEAR 1 Provide a table summarizing the status of the TMDL process. Include a list of prioritized TMDLs and their monitoring and implementation schedule; and include the Identification number of the outfall prioritized for TMDL monitoring. **No TMDL's adopted at this time**

WBID Number	Segment/ Waterbody/ Basin	Pollutant of Concern	TMDL DEP / EPA	Percent Reduction (WLA)	Priority Rank	Priority Outfall	Monitoring Summary / BPCP Due Date	Supplemental SWMP Due Date
			☐ /☐		1		*(Year 3 AR)*	*(Year 4 AR; N/A) if BPCP)*
			☐ /☐					
			☐ /☐					

B. YEAR 3 and annually thereafter, provide a summary of the estimated load reductions that have occurred for the pollutant(s) of concern being discharged from the MS4 to the TMDL water body during the reporting period and cumulatively since the date the Supplemental SWMP was implemented.

Year 3: Submit a Monitoring data summary or BPCP (if applicable). N/A

Year 4: Submit a Supplemental SWMP (if applicable).

WBID Number	Pollutant of Concern	Monitoring Summary / BPCP Submitted	Supplemental SWMP Submitted	Projected load reductions OR Actual load reductions to date
		(Year 3 AR)	*(Year 4 AR; N/A if BPCP)*	

C. Provide a brief statement as to the status of TMDL implementation according to Part VIII.B of the permit (e.g. status of monitoring to validate WLA):

ATTACHMENTS

Part III.A.2 Areas of New Development and Significant Redevelopment

Only one commercial development at 754 Park Avenue was reviewed and approved , but the site is only 0.33 acres and did not require follow up NPDES inspections. Other commercial and light industrial projects (such as the Silver Beach Industrial Park) have either not completed the Town's approval process or has not yet started construction.

Part III.A.4 CIP Flood Control Projects

The following Tables indicate the specifics for the swale flood control project and the CIPP O&M activities performed at four (4) locations in the stormsewer system

Storm Water Retrofit Projects / Main Line Repair or Replacement	Column1	Column2	Column3	Column4
Project Location		Length in Feet	Pipe Size	Type
638 Kalmia Dr.		56	15"	RCP was CIPP
1600 Flagler Blvd		35	15"	Replace RCP
904 Jasmine Dr		35	18"	Replace RCP
704 to 722 W. ilex Dr.		233	18"	RCP was CIPP
Annual Total Pipe Replacement Footage				
		359		

Part III.A.7.c NOV/WL/citation/fines issued for illicit discharges etc. found during reactive investigation

Storm Water IDDE Training/ Pipe Line Safety/ Storm Watch Training / Safety - Tips to Avoid Heat Stress / Safety - The Best Way to Wash your Hands/ Safety - Share the Road Safely with Pedestrians/ Safety - Prevention Tips/ Safety - Power to Change (Video)/ Safety - Planning a Safe Day/ Safety - Machine Guard Safety/ Safety - Listening Safety/ Safety - Help Stop the Spread of Coronavirus/ Safety - Hand Sanitizer Safety/ Safety - Gasoline (Toolbox Talks)/ Safety - Foot Protection/ Safety - FEMA Disaster Work In-Take Sheets/ Safety - Electrical Safety-Controlling the Hazards (Video)/ Safety - Drug and Alcohol Abuse/ Safety - Don't Exceed the Posted Height of Bridges, Overpasses and Wires/ Safety - Can You Find the Mistake [Inattentional Blindness]/ Safety - Back to School, A Pedestrian's Point of View/ Safety - A Strong Defense Against Flu/ Safety - 10 Keys to Facility Fire Safety.

YEAR 4 MS4 Permit Reapplication AR Checklist for Inclusions for Permit Renewal

Per F.A.C Requirements, the following MS4 Permit Reapplication items are addressed as part of this Town of Lake Park Cycle 4, Year 4 Annual Report (AR):

(1) A statement with the timely filing of the Year 4 Annual Report, stating that the Year 4 Annual Report is to serve as the principle component for re-application (may be included in a transmittal letter or as an attachment, note in Section V of the report). Include proposed revisions requested to the permittee's activities required under the existing permit, if applicable. Per 62-624.420(2), F.A.C.

See attached Cover Letter

(2) Current information for Section I of the Year 4 Annual Report. Per 62-624.440(1)(a-c), F.A.C.

No changes, provided in AR Section I

Should be provided in AR (Section I) permittee Contact info.

(3) Listing of changes in co-applicants (co-permittees) since issuance of initial MS4 permit. Per 62-624.440(1)(d), F.A.C.

N/A

(4) Identification of any previously unidentified water bodies receiving discharges from the MS4; and a summary of any known water quality impacts on the newly identified water bodies from the MS4 discharge. Per 62-624.440(1)(e,f), F.A.C.

N/A

The only two waterbodies receiving discharge from the Town of Lake Park MS4 watersheds are the C-17 Canal to the west and the Lake Worth Lagoon to the east.

(5) Summary of known or estimated reductions in stormwater pollutant loads discharged from the MS4 resulting from implementation of the stormwater management plan (SWMP) during the term of the most recent permit. Per 62-624.440(1)(g), F.A.C.

Table 2 of the attached Town of Lake Park MS4 Stormwater Master Plan Assessment Program Annual Results Report dated 3/29/2021 includes a comparison of pollutant load discharges to the C-17, and LWL from the Town MS4 Basins for Cycle4, Year 3 and Cycle 4, Year 4. This comparison indicates that a net 1-3 % reductions in all pollutant loads were obtained with the current BMP applications (mostly dry and wet detention facilities).

These reductions are applicable to the existing t Town of Lake Park Stormwater Masterplan (SWMP), and do not include the BMP proposed in the 2020 SWMP update. The 2020 SWMP, using the latest H&H modeling and LiDAR topographic data methodology with emphasis on Green Infrastructure BMP's Town-wide, was just completed in December 2020.

The SWMP update includes a number of GI-based projects that are under design and will be implemented as part of the FY2021-2025 CIP planning period. These include Bioswales, Biodetention, and Underground Filtration Chambers.

(6) If the total annual pollutant loadings for each parameter in the permit's Table V.A.1. have not decreased since the issuance of the previous MS4 permit, appropriate revisions to the SWMP shall be included. Per Permit Part V.A.3.

The Table 2 comparison above indicates that pollutant loadings for all parameters in the Table V.A1 of the permit decreased. However, the updated SWMP proposes the use of Town-wide GI/LID BMP's which will significantly speed up the MS4 permit pollutant load reductions goals. The specifics of the proposed GI-based BMP plan is included in Sections 3 and 4 of the attached Town of Lake Park MS4 Stormwater Master Plan Assessment Program Annual Results Report dated 3/29/2021.

(7) Submit a copy of the existing Assessment Program (completed by the permittee in C4Y1) with any requested revisions, to be used by the permittee in Cycle 5 as an attachment. Per Permit Part V.B.5- *Submission of the Assessment Program for Reissuance*. The submission of the Assessment Program shall include either: A. A statement the Assessment Program does not require revision; or

B. Proposed revisions to the Assessment Program (noted in the plan document).

The attached Town of Lake Park MS4 Stormwater Master Plan Assessment Program Annual Results Report dated 3/29/2021, includes a detail assessment of the Town's sampling plan and makes a recommendation (under Section 2.5 Monitoring Site Location Adequacy) to relocate Location Sampling #1 to better reflect the first flush from US Highway 1.

The FDOT US Highway 1 ROW discharges through the Town's Southern Outfall (Site #2). Currently, Site 1 is downstream of site 2 and does not capture the "first flush" pollutant loads from the mostly impervious US Highway 1 ROW.)

(8) Permit Part VI.C.- *Reapplication: Evaluation of SWMP Effectiveness*: A. An evaluation of the effectiveness of the SWMP in reducing pollutant loading from the MS4, accomplishments in the implementation of MS4 pollutant reduction activities, and the overall effectiveness of SWMP implementation. The permittee should utilize information generated in Part V and Part VIII of the permit in composing their evaluation.

The attached Town of Lake Park MS4 Stormwater Master Plan Assessment Program Annual Results Report dated 3/29/2021, includes a detail assessment of the Town's sampling plan results and its effectiveness (Section 2.8 Trend Analysis for Town of Lake Park Sampling Locations, and Section 3 (Pollutant Load Estimate Plan).

B. Describe whether stormwater pollutant loadings discharged from the MS4 have decreased. Include results and annual loadings from Part V.; and

Table 2 of the attached Town of Lake Park MS4 Stormwater Master Plan Assessment Program Annual Results Report dated 3/29/2021 includes a comparison of pollutant load discharges to the C-17, and LWL from the Town MS4 Basins for Cycle4, Year 3 and Cycle 4, Year 4. This comparison indicates that a net 1-3 % reductions in all pollutant loads were obtained with the current BMP applications (mostly dry and wet detention facilities)

C. Recommended SWMP revisions for each of the elements in Part III of the permit as a result of the SWMP evaluation. Based on an analysis of the assessment results, identify any areas or drainage basins within the boundaries of the MS4 that should be targeted for corrective action(s). If applicable, specify what corrective actions should be completed and a timetable for implementation. Corrective action(s) include, but are not limited to, retrofits, structural BMPs, and non-structural BMPs (e.g., public education, street sweeping).

The attached Town of Lake Park MS4 Stormwater Master Plan Assessment Program Annual Results Report dated 3/29/2021, includes under Section 4 -Evaluation and Response Plan , a detail assessment of the Town's BMP's throughout the Town's MS4 basin areas (mostly dry and wet detention BMP's). It also provides a detail discussion of a forward path to implement the SWMP 2020 Update 5% Bioswales Plan.

Four (4) BMP sites are being proposed for the FY2021-2025 CIP planning period that includes Bioswales, Biodetention and Underground Filtration Chambers. These facilities, currently under design, will be implemented in FY2022, and FY2023 and will be available for the Cycle 5 Annual Assessment Reporting.

(9) TMDL Implementation Plan / Supplemental SWMP to be submitted as part of the permit renewal application (if applicable TMDL activities have been undertaken). Per Permit Part VIII.B.2.d.

N/A

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WATER RESOURCES | ENGINEERING

THE TOWN OF LAKE PARK

MS4 STORMWATER MASTERPLAN
ASSESSMENT PROGRAM
ANNUAL RESULTS REPORT

CYCLE 4, YEAR 4
March 29, 2021

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FIGURES

TABLES

1. TOWN OF LAKE PARK ASSESSMENT PROGRAM

1.1 Assessment Program Objective

The purpose of this assessment program is to provide information for the Town of Lake Park to determine the overall effectiveness of its Stormwater Management Program (SWMP) in reducing stormwater pollutant loadings from its Municipal Storm Sewer System (MS4) to receiving water bodies. Phase 1 MS4 Monitoring Plans are required to meet the following goals:

A. Identify areas that can be targeted for corrective action that have a potential for water quality problems related to stormwater runoff. The corrective actions include, but are not limited to, non-structural BMPs (i.e., trash collection, street sweeping, public education), structural BMPs and retrofits.
B. Measure the effectiveness of stormwater pollution reduction measures, such as BMPs that have or will be implemented.
C. For specific outfalls or watersheds, document pollutant loadings and/or trends in pollutant loadings.

1.2 Assessment Program Components

As required by the MS4 Permit, the following components make up this Assessment Program:

A. Water Quality Monitoring Plan – the plan identifies local sources where urban stormwater adversely affects surface water resources.
B. Pollutant Loading Estimate Plan – the plan is intended to estimate the Pollutant Loading from the MS4 contributing area, based on BMPs and land use.
C. Evaluation and Response Plan – the plan is intended to propose a plan of action to be taken based on the results of the Water Quality Monitoring Plan and Pollutant Loading Estimate Plan. The plan will be used for the following:

    1. Analyze trends in Pollutant Loading from the MS4.
    2. Analyze trends in water quality that discharges from the MS4.
    3. Identify areas of the MS4 to be targeted for corrective measures and loading reduction.

2. WATER QUALITY MONITORING PLAN

2.1 Identification and Monitoring of Land-Based Pollutants in the Town of Lake Park

Sediment concentrations of heavy metals such as cadmium, copper, lead, and zinc, tend to be high in urbanized areas such as the Town of Lake Park. These sediments can be transported and discharged into local waterbodies during wet weather events. In addition to metals, stormwater runoff may also carry fertilizers, pesticides, herbicides, and petroleum products, which provide excess nutrients to receiving waterbodies. Associated high nutrient loads of nitrogen and phosphorus can result in decreased oxygen levels in the water and potentially algal blooms, which are a serious threat to public health and safety. Toxins released from algal blooms may lead to skin or breathing problems, kill fish, and deplete seagrass beds that are key food sources for many aquatic species.

The total concentration of pollutants from the Town of Lake Park largely varies with land use. Metals may be released from brake pads, plumbing, and industrial or commercial activities. Fertilizers, pesticides, and other chemical pollutants can stem from lawns or agricultural areas. The following describes existing land uses with the Town.

Existing Land Use Map

The Town of Lake Park's municipal boundary encompasses 1383.7 acres (2.16 square miles), including portions of the Lake Worth Lagoon (LWL). Of this total area, 1,116 acres (1.74 square miles) are non-water areas contained within the upland corporate limits. **Figure 1** shows the Town of Lake Park boundaries and existing land uses. Lake Park is a mature urban area incorporated originally as Kelsey City in 1923. The Town is essentially a platted, residential community, with linear commercial areas along U.S. Highway No. 1, Northlake Blvd, Tenth Street and Park Avenue. There is a large mixed commercial and light industrial area located to the west of the Florida East Coast Railroad, which divides the Town.

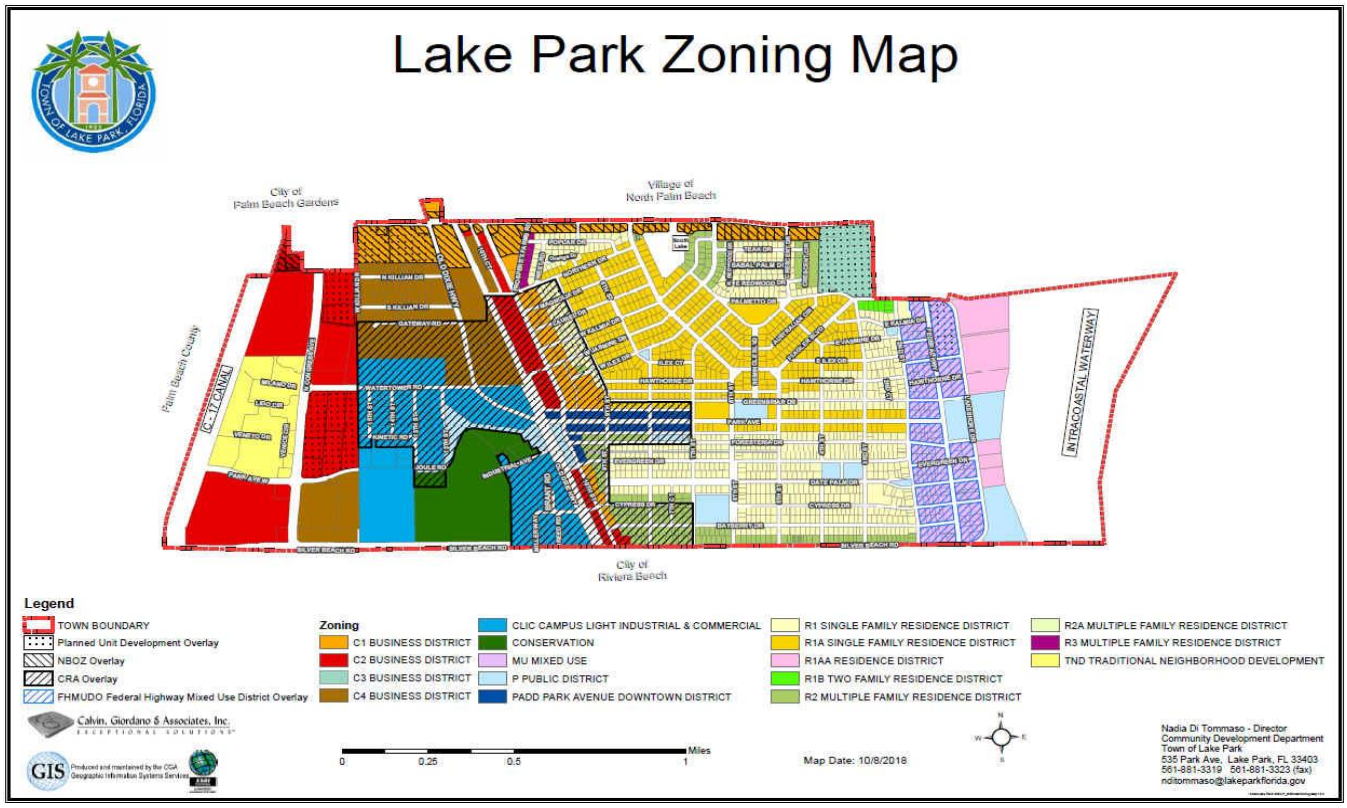


Figure 1. Town of Lake Park Boundaries and Existing Land Use

Single family, low density residential developments comprise the largest single land use category within the Town. Approximately 305 acres, or 34.4% of the total area of the Town, is used for single-family residential purposes; while 56.4 acres are used for medium density and 22.2 acres are used for high density development. Almost all of the low-density development is located west of the Florida East Coast Railroad and west of U.S. Highway No. 1.

Commercial development in the Town is located along four corridors: (1) U.S. Highway No. 1; (2) Northlake Boulevard; (3) Prosperity Farms Road/Tenth Street; and (4) Park Avenue. There are two major shopping centers, including the Twin City Mall (i.e., shared with the Village of North Palm Beach). Smaller centers and free-standing businesses surround the thruways. Commercial uses in these facilities are primarily retail, service, and professional businesses; together accounting for 135.9 acres, or 8.5% of the total area of the Town.

Mixed commercial and light industrial land use account for 95.1 acres and constitutes 8.5% of the municipal land area. All of these uses are located along Congress Avenue and are buffered from the

remainder of the Town by the Florida East Coast Railroad. The greatest amount of vacant land is located in this area.

Recreational/open space land use consists of 31.9 acres, or 2.9% of the corporate area, and Public building and grounds land use currently utilizes 9.4 acres and constitutes approximately 0.8% of the corporate area. Existing rights-of-way for roads and streets and the Florida East Coast Railroad consume approximately 22.4% or 250 acres of the total area in Lake Park. Water areas constitute a minor portion (i.e., 0.8%) of the total area of the Town.

Future Land Use Map

Figure 2 shows the future land use map for the Town of Lake Park. Presently, the Town is built-out to approximately 84% of the corporate area. Only 16%, or 158 acres of the total area, is vacant and potentially available for future development. Of this total, 132 acres or 84% of the total vacant area is designated and zoned for future mixed commercial/industrial development.

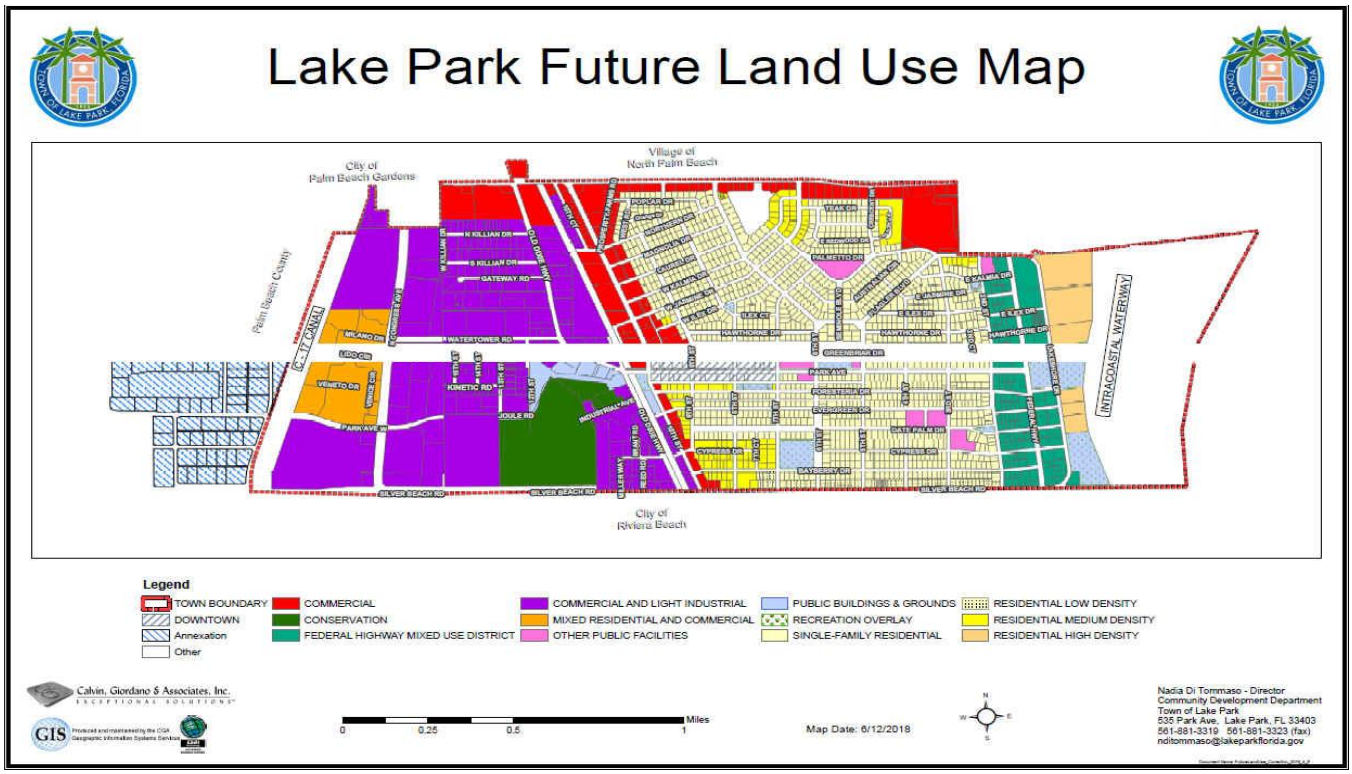


Figure 2. Future Land Use

Figure 2 includes some land for potential expansion along the western boundary of the Town's current limits. However, there are no specific plans for implementing the future annexation at this time. Comparisons of both Figure 1 and 2 land uses indicate that water discharges from the Town of Lake Park jurisdiction will not significantly change in quality in the near future.

2.2 Lake Worth Lagoon Water Quality Issues

All surface waters in Palm Beach County, including the LWL, are classified as Class III waters (with few exceptions). Population increases in Palm Beach County have altered regional watershed hydrology. Large-scale freshwater releases from regional canals such as the C-17 Canal, along the west boundary of the Town of Lake Park, are the main stressors for potential habitat loss and degradation of water quality in the LWL.

Water quality within the lagoon has been significantly degraded by various drainage, dredging, and costal development projects in the past. These projects have caused significant alterations in the timing, distribution, quality, and quantity of fresh water that enters the coastal waterways including the C-17 Canal. Large volumes of freshwater discharge into the Lagoon, primarily through the C-17, C-51, and C-16 canals, can cause extreme salinity fluctuations which can be harmful to many aquatic organisms, such as oysters and seagrasses unable to tolerate excessive freshwater inflows.

While salinity fluctuations are a problem with freshwater discharges, a major threat to the recovery of the LWL is excess ***suspended sediments.*** Suspended sediments increase turbidity and thereby decrease the amount of sunlight that reaches the bottom of a water column. As sediments fall out of suspension, they accumulate on the bottom, sometimes forming a silty layer over previously natural sediments which affect the flora and fauna. At present, water quality within the Lagoon is highly variable and is best in the vicinity of the inlets, where the water is subjected to tidal flushing and enhanced circulation.

There are three major freshwater inflows from the watershed discharged to the Lagoon estuary via regional canals. One of these is the Earman River Canal (C-17 Canal) that discharges to the northern segment of the lagoon (LWL) where the Town of Lake Park is situated. The Town of Lake Park stormwater discharges occur to both the C-17 (Earman River) Canal along the west and north and to the LWL directly along the east.

Impairment/TMDL's for Lake Worth Lagoon

The Town is located in the northern Lake Worth Lagoon segment. Per the latest (January 2020/Cycle 3 NPDES/MS4) impaired water body list, the northern LWL segment is classified as impaired by Cooper and Nutrients (Chlorophyll- a). This segment of the LWL is impaired for these parameters based on the number of exceedances for the sample size, and these parameters have been added to the USEPA 303(d) List. The priority for TMDL development is considered medium and no TMDL's apply at this time for discharges from the Town of Lake Park MS4's areas.

2.3 LWL Water Quality Monitoring Network

The LWL monitoring network implemented in October 2007 consists of 22 separate sites. **Figure 3** shows the location of NPDES Site 13 and LWL Monitoring sites LWL2, 3 and 4. These are the sites that are used to correlate the upland water quality discharges to the receiving water body (LWL). LWL4 is the most applicable to the Town of Lake Park direct and C-17/Earman River pollutant load discharges.

Several parameters have been analyzed on a monthly basis including dissolved oxygen (DO), pH, salinity; Kjeldahl Nitrogen (TKN), Ammonia Nitrogen (NH4), Nitrite-Nitrate Nitrogen (NOX), Total Phosphorus (TP) And Orthophosphorus (OPO4), Turbidity, and Chlorophyll- a.

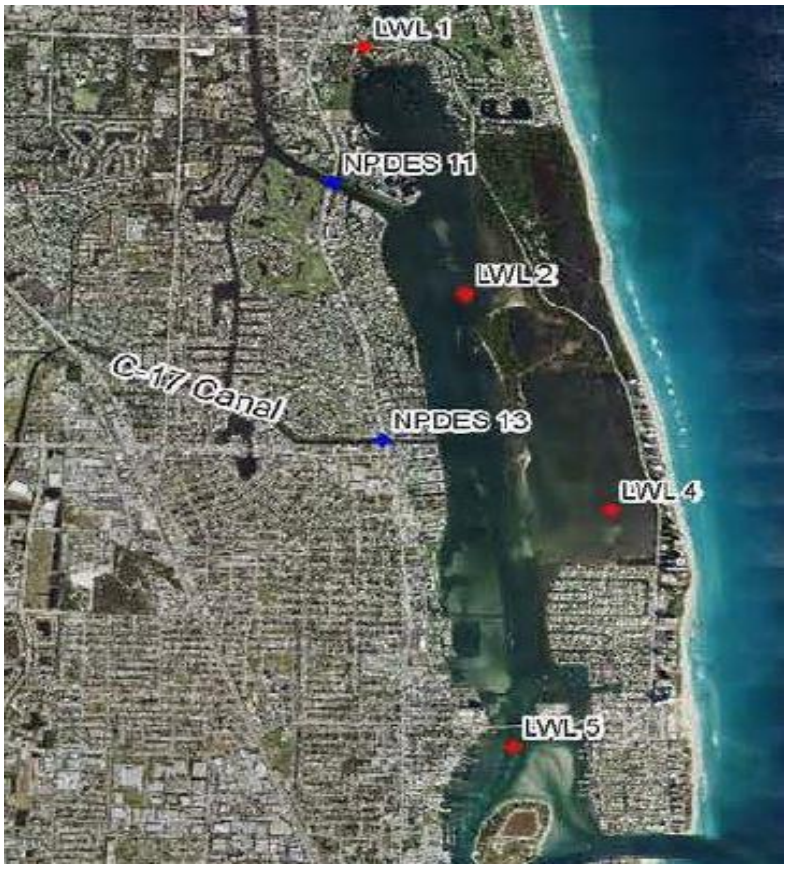


Figure 3. NPDES and LWL Water Quality Monitoring Sites

The Town of Lake Park is located in the Northern Lake Worth Lagoon segment. The 2013 plan is currently under review. Items within the plan are being assessed and an updated version will be published and approved by the Lake Worth Lagoon Initiative (LWLI) in the near future.

Lake Worth Lagoon water quality trends for the period from 2007-2012 for all three segments of the LWL are presented in Table 10 of the 2013 Lake Worth Lagoon Management Plan and shown here as **Figure 4.**

Parameters	Statistics	Segments			IRL04
		LWN	LWC	LWS	
Salinity	minimum	14.80	6.93	0.36	30.10
	maximum	38.00	36.60	38.00	38.10
	median	33.4***a***	30.8***c***	32.8***b***	35.10
	average	32.55	29.05	30.30	34.10
	standard deviation	3.66	6.18	6.37	1.88
Chlorophyll *a*	minimum	1.00	1.00	1.00	0.50
	maximum	31.00	38.00	45.00	5.00
	median	2.00***b***	4.00***a***	4.00***a***	2.00
	average	3.22	5.00	5.69	1.75
	standard deviation	3.03	4.66	5.24	1.04
TN	minimum	0.12	0.22	0.08	0.09
	maximum	1.07	1.13	1.23	0.37
	median	0.30***c***	0.40***a***	0.37***b***	0.19
	average	0.33	0.48	0.42	0.20
	standard deviation	0.14	0.21	0.22	0.07
TP	minimum	0.004	0.014	0.006	0.010
	maximum	0.087	0.098	0.222	0.033
	median	0.022***c***	0.039***a***	0.03***b***	0.014
	average	0.024	0.041	0.036	0.014
	standard deviation	0.012	0.014	0.023	0.005
Secchi Disc Depth	minimum	0.5	0.4	0.5	0.9
	maximum	4.8	4.2	3.3	2.8
	median	1.2***b***	1.4***a***	1.3***a***	1.6
	average	1.4	1.5	1.5	1.6
	standard deviation	0.6	0.7	0.6	0.5
TSS	minimum	1.5	1.5	1.5	1.50
	maximum	59.0	37.0	43.0	22.00
	median	6.0***c***	8.0***a***	7.0***b***	8.00
	average	7.8	9.9	9.1	8.47
	standard deviation	7.3	6.4	6.9	6.05

Figure 4. Lake Worth Lagoon Management Plan Water Quality Values (mg/l)

2.4 Town of Lake Park Water Quality Monitoring Program

As a co-permittee of the Palm Beach County NPDES/MS4 permit program, where the Northern Palm Beach County Improvement District is the Lead Permittee, the Town of Lake Park collects quarterly ambient water quality data throughout the Town at four (4) designated sampling sites.

As required by the MS4 Permit, the Town utilizes a FDEP approved lab using NPDES-approved procedures to perform quarterly sampling at these locations for five test parameters, including Chlorophyll- a, Dissolved Oxygen (DO), Total Phosphorus (TP), Total Nitrogen (TN), and Total Suspended Solids (TSS). **Figure 5** shows the location of the four sampling sites. The four sampling locations where selected based on the type of water quality pollutant that could be generated by the land uses in the surrounding areas.

- Location 1

  148 Data Palm Drive – Basin 12, Structure #103. Google Earth: 26*47'41.25"N, 80*3"22.30W Water sampling at Location 1 is from the bottom of a manhole along a 60" RCP part of the Southern Outfall to Lake Worth Lagoon. This sampling location is supposed to be representative of the upstream 446-acre residential watershed.

- Location 2

  301 Federal Hwy – Basin 12, Structure #131A. Google Earth: 26*47'41.93"N, 80*3'13.85"W Samples are pulled from a manhole along a 72" CAP part of the Southern Outfall that discharges to Lake Worth Lagoon at the Town's Marina. This sampling location was selected to assess the impact of discharges from the US Highway 1 right-of-way and adjacent business District.

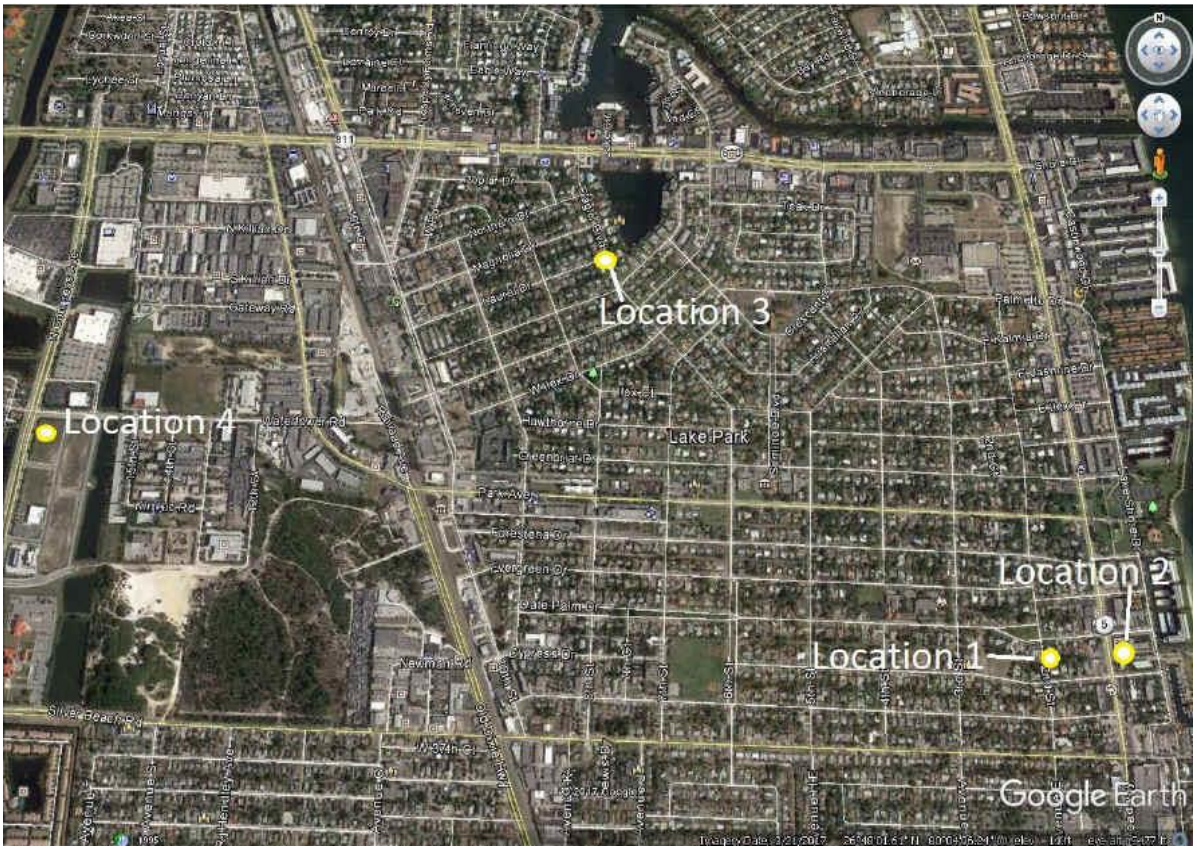


Figure 5. Town of Lake Park NPDES Sampling Location Sites

- Location 3

  1406 Flagler Blvd – Basin 15, Structure #35A. Google Earth: 26*48'17.43"N, 80*4'5.63"W Samples area pulled from a manhole along a 36" RCP outflow to South Lake.

This sampling location was selected to assess the impact of discharges from the residential district area southwest of South Lake or representative of the stormwater outfalls to the Earman River.

- Location 4

  Intersection of Congress Avenue and Watertower Road (Southeast Corner) – Basin 26, Structure unnamed. Google Earth: 26*48'1.67"N, 80*5'4.21W. Samples are pulled from the downstream site of a control structure discharging a 96" RCP outflow to SFWMD C-17). This sampling location was selected to assess the impact of discharges representative of the Campus Light Industrial and Commercial area east of Congress Avenue and west of the Florida East Coast Railroad tracks.

As part of the NPDES Permit program, specific MS4 areas have been designated for the purpose of monitoring water quality discharges and the application effectiveness of Best Management Practices (BMPs) for the reduction of pollutant loads to the LWL. **Figure 6** shows these areas as a function of the Town's land uses and stormwater management system discharging to the C-17/Earman River and LWL.

Figure 6. MS4 Basin Areas, Land Uses & Monitoring Locations

Figure 7 depicts the MS4 Basin areas as a function of the system of roads and the current drainage infrastructure composed mainly of roadside inlets and stormsewers discharging to the LWL (east), the C-17 Canal (West) and the Earman River (north).

Figure 7. MS4 Basin Areas, Monitoring Locations & Drainage System Infrastructure

2.5 Monitoring Site Locations Adequacy

Figures 5 and 6 indicate that the current MS4 Basin areas are representative of the residential, commercial, and light industrial areas and the stormwater management system discharging runoff.

Sampling Location 1:

The location of this site is 750 feet from Site 2 upstream along the same (Southern Outfall) conduit. Site 1 was selected to measure the pollutant discharges from the 147- acre US Highway 1 ROW and adjacent commercial district catchment area with a time of concentration much shorter than the runoff measured at Site 2 with a contributary area of 446 acres and time of concentration much larger than that of site 1. This means that the first flush of runoff which carries the bulk of the pollutant load would pass through and discharge much sooner than that of the pollutant load arriving at Site 2 much later. It is very likely that the US Highway1 ROW drainage area pollutant-laden runoff peak discharges well before the three (3) hours after the storm sampling requirement. It is also very likely that the Site 1 pollutant baseline is reflective of the Site 2 baseflow after 3 hours.

The results of the 2019 sampling plan have been reviewed and there is very little difference between the sampled parameters at both sites. Therefore, it is recommended that a new sampling location more representative of the runoff pollutants along the US Highway 1 right-of-way. **Figure 8** shows the new recommended location at the Intersection of Evergreen Drive and US Highway 1. This site (FDOT Manhole Structure S-111) is approximately 500 feet north of the FDOT stormsewer discharge into the Southern Outfall.

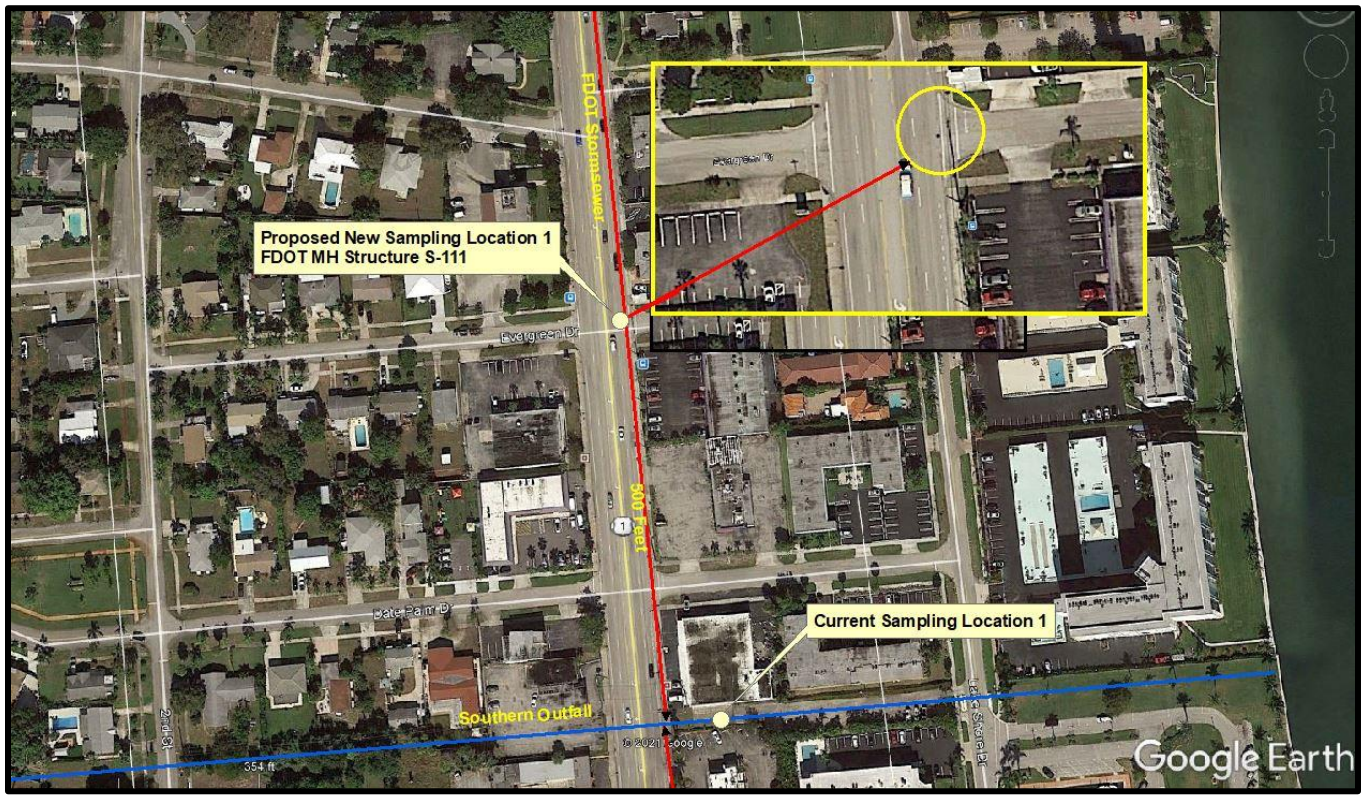


Figure 8. New Proposed Sampling Site 1 Location

There is also the issue of the proximity of these sampling locations to tidewater. Sampling locations 1, 2, and 3 are manholes with inverts well below LWL tides and it is very important to perform the sampling during low tide. This issue will become progressively more difficult as Sea Level Rise will increase tides. Locations 1 and 2 will be impacted the most.

The Town is in the process of installing inline valves at the LWL stormwater outfalls. The Lake Shore Drive Drainage Improvement project, currently underway in FY 2021 is placing valves at three (3) smaller outfalls to the Lagoon and the proposed Southern Outfall Priority project would do the same in the FY2022-2023 period.

Sampling Location 4:

This sampling location was selected to assess the impact of stormsewer discharges representative of the Campus Light Industrial and Commercial area west of the Florida East Coast Railroad tracks. **Figure 9** shows that Site 4 is located at the outfall pipe discharging from a detention lake south of Water Tower Road that collects runoff from the surrounding commercial sites.

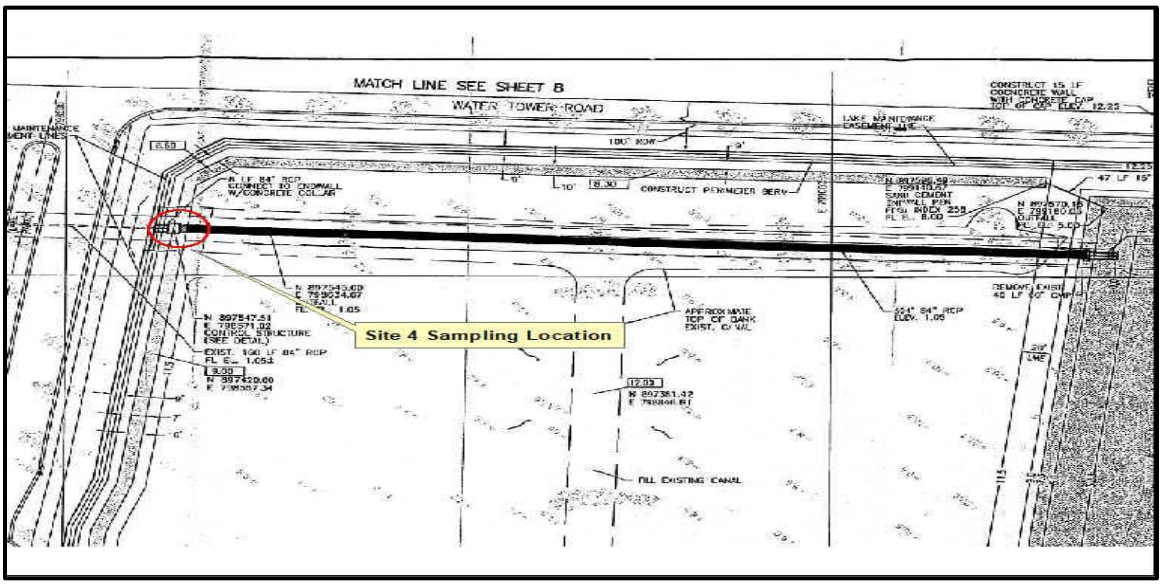


Figure 9. Site 4 Sampling Location

Figure 10 indicates that although the discharge from Site 4 originally flowed west to the C-17 canal via an existing ditch to a culvert at C-17, this transport system was radically changed when privately-owned residential development took place west of Congress and eats of the C-17 ROW. Currently, the Site 4 outfall discharges under Congress Avenue into a system of wet detention lakes at the privately-owned residential development (San Marco Villa) with a significant residence time of treatment prior to discharge to the C-17 canal. This means that pollutant loadings from the Town's MS4 Campus Light Industrial and Commercial areas get further treated or attenuated at the stormwater management system of the new development.

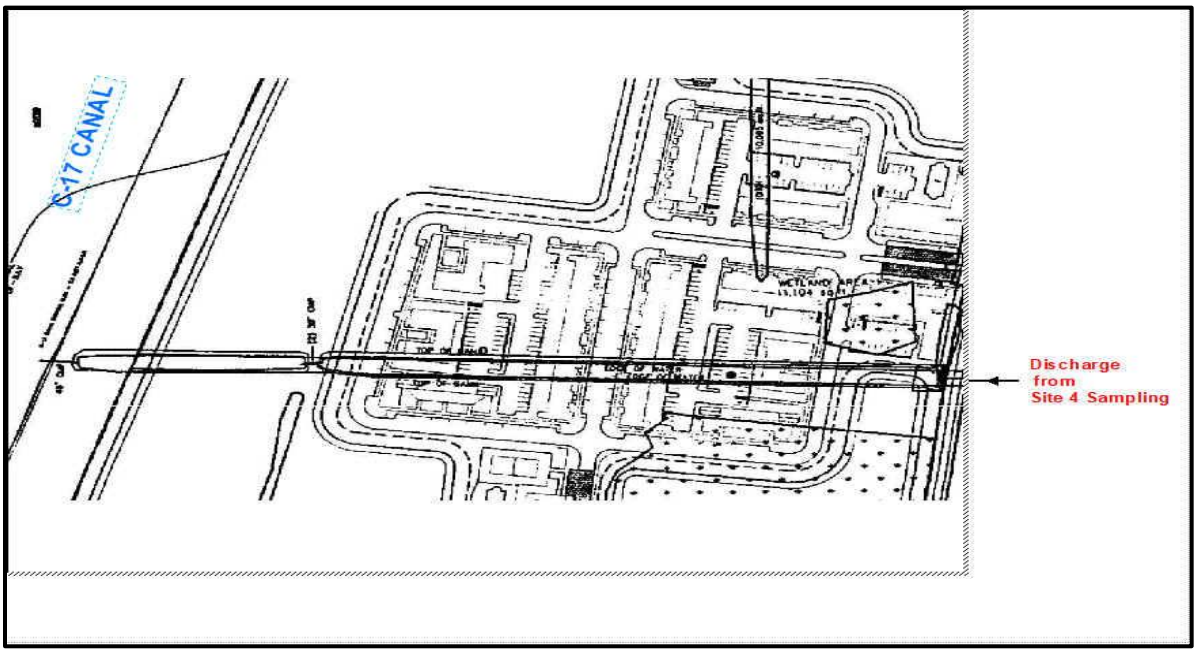


Figure 10. Original Site 4 West Discharge to C-17 Transport System

Figure 11 shows that algae mats are evident at the San Marco Villas lake system receiving the Site 4 NPDES discharge. The stormwater management system at the San Marco Villa residential development is under private ownership and maintenance, and it appears that Best Management Practices (BMPs) to control nutrient/sediments loads are not being currently in effect and need to be recommended for implementation to reduce future pollutant discharges to the C-17 Canal and the LWL.

It was reported at the Cycle 4 Year3 Town of Lake park Annual Report that Chlorophyll- a values at the Site 4 location ranged from 8.1 to 24.8 exceeding the State Standard of 20 ug/l. It was also stated that these Chlorophyll- a values were higher because of the nutrient-laden stormwater management lakes at the San Marco Villas development (i.e., algae mats resulting from the adjacent parking lots and roadside landscape features that could result in the Chlorophyll- a spikes).

Examination of sampling procedures indicated that sampling had been historically performed in the discharge side of the weir control structure at Location 4 which is the side connecting to the residential stormwater management system of lakes on the west side of Congress. Therefore, it was recommended in the Cycle4 Year 3 report that by switching the sampling to the incoming side of the outfall better (lower) Chlorophyll- a concentrations could be obtained that were more in line with values at the three other sites.

This hypothesis was to be tested during the 2019/2019 sampling period and the results are provided in the following section.

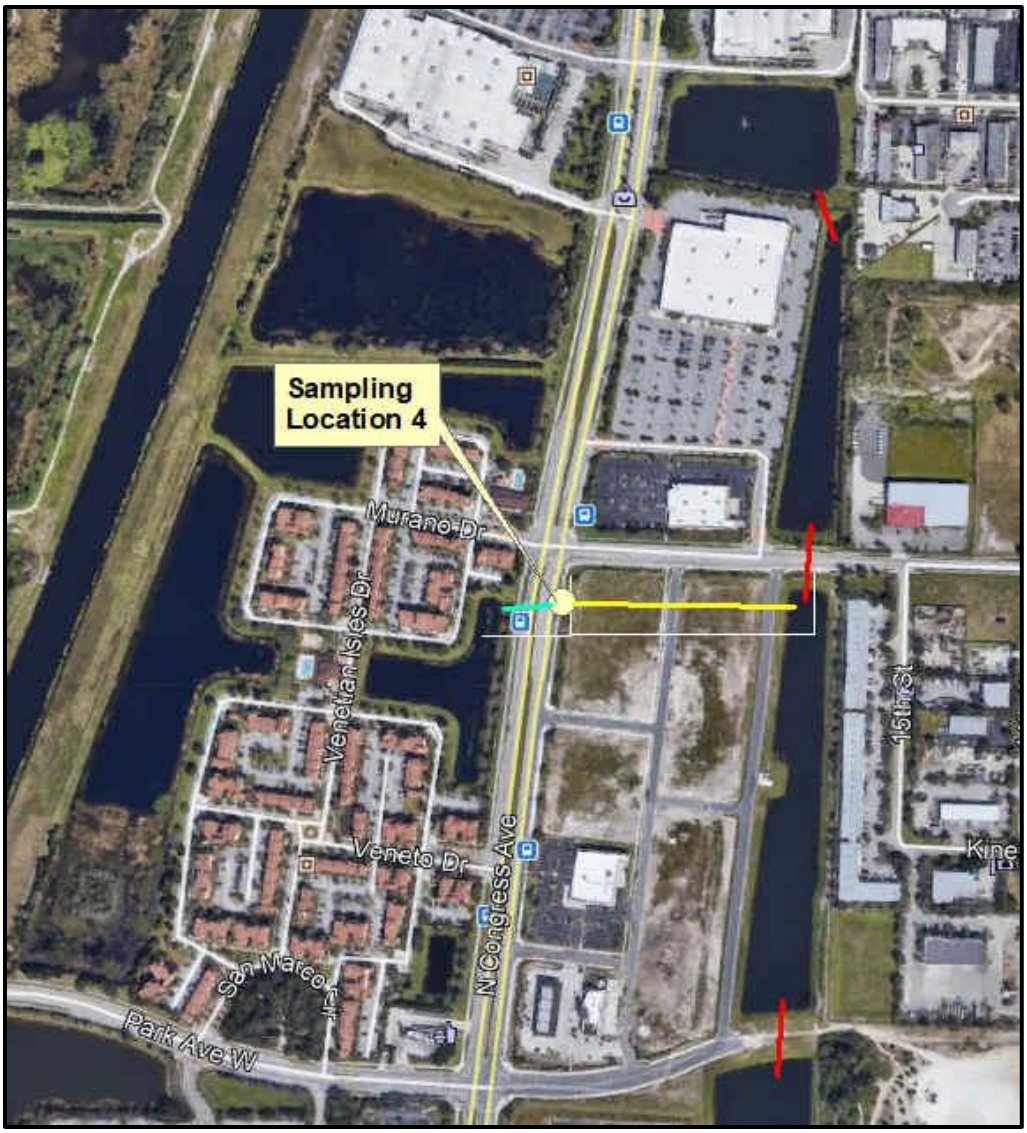


Figure 11. Source of Downstream Water for Location #4 Sampling

2.6 Water Quality Monitoring Results – Tabular

Results of the sampling period from March 2019 to September 2019 have been tabulated and are presented in X-Y scatter plots. The plots also include the State of Florida Standard Minimum Detection limits by which these pollutant values are compared to for program assessment.

The following sampling guidelines were observed:

- Sampling was performed for storms of 0.75 inches or greater.
- Sampling was performed (when possible) within 3 hours after the storm event.

- Sampling was performed at low tide to avoid brackish water influence on pollutant concentrations.

Sampling events are recommended by the NPDES Program for each quarter as follows:

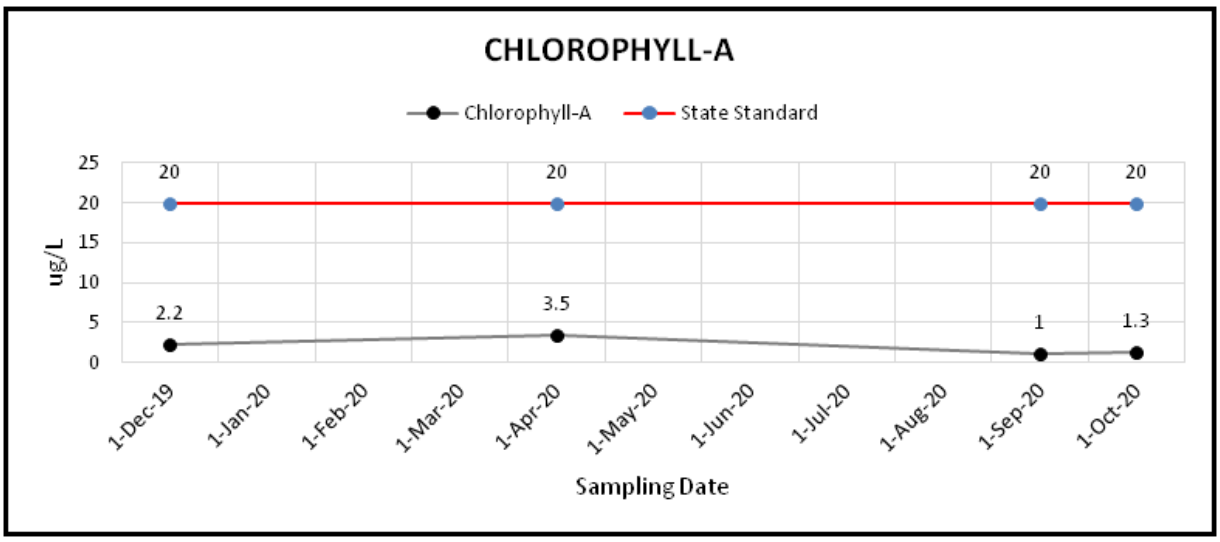
- First sampling quarter: October 1st to December 31st
- Second sampling quarter: January 1st to March 31st
- Third sampling quarter: April 1st to June 30th
- Fourth sampling quarter: July 1st to September 30th

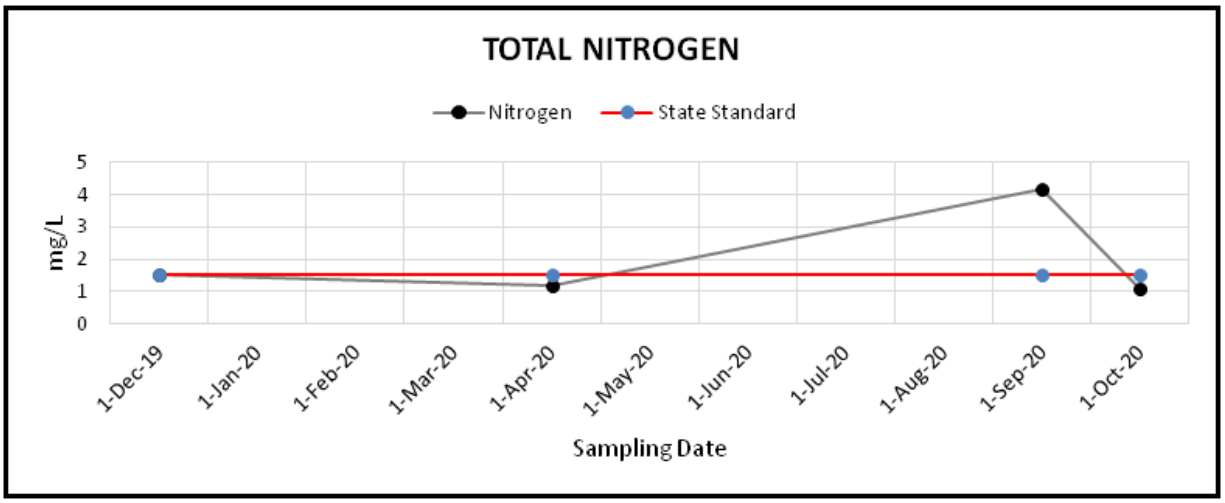
There was no sampling performed in the second quarter of 2020 due to changes in management and sampling responsibilities. However, two sampling events were performed in the fourth quarter (October 2nd and October 26th) to compensate and increase accuracy of reporting. The October 2nd was used in this cycle and the October 26th will be applied for the FY2021-2022 NPDES cycle. No Dissolve Oxygen (DO) % Saturation Data was obtained at any of the sites.

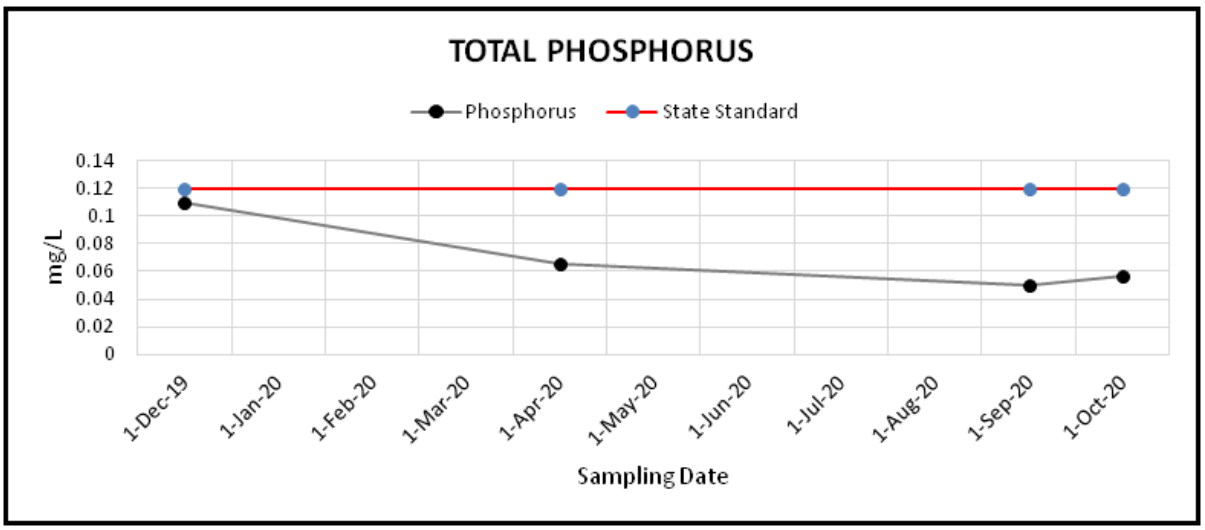
The State surface water quality criteria for Chlorophyll-a, TN and TP is based on Annual Geometric Mean (AGM) values. Location 4 is in the South Florida Watershed Region (C-17 Canal Basin) and as such there is no numeric State Surface Water Quality Criteria for TN and TP. Locations 1, 2 and 3 are in the Peninsular Region where FDEP has adopted numeric nutrient values for Chlorophyll-A, TN, and TP concentrations. The following AGM's apply: Chl-a: 20 ug/l, TN: 1.54 mg/l, TP: 0.12 mg/l.

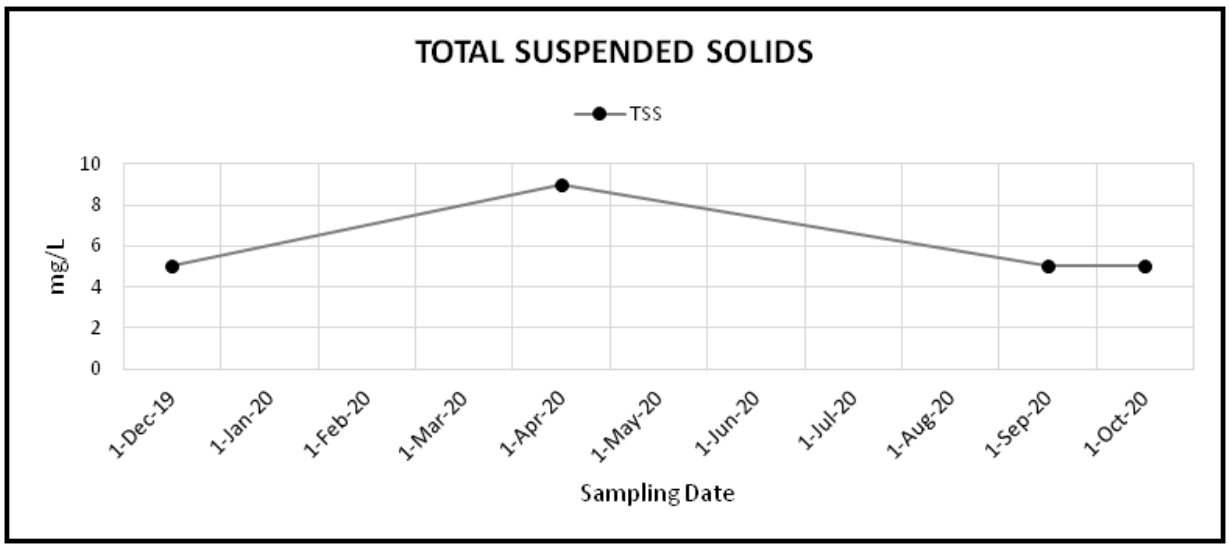
Location #1 Data and Plots

LOCATION #1 Single-Family Medium	Chlorophyll- a ug/l	Total Nitrogen mg/l	Total Phosphorus mg/l	Total Suspended Solids mg/l	Dissolved Oxygen % Saturation
State Standard Criteria	20	1.54	0.12	N/A	N/A
December 19, 2019	2.2	1.5	0.11	5.0	No Data
April 17, 2020	3.5	1.2	0.066	9.0	No Data
September 1, 2020	1.0	4.2	0.050	5.0	No Data
October 2, 2020	1.3	1.1	0.057	5.0	No Data


CHLOROPHYLL-A
Chlorophyll-A
State Standard
ug/L
25
20
15
10
5
0
20
20
20
20
2.2
3.5
1
1.3
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
1-May-20
1-Jun-20
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date

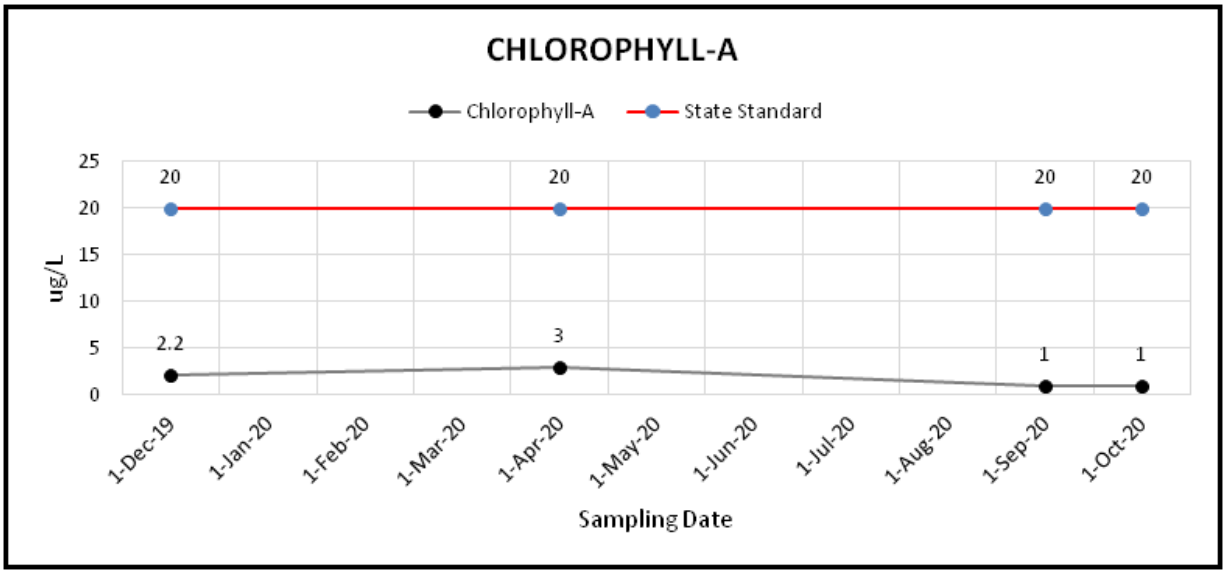

TOTAL NITROGEN
Nitrogen
State Standard
mg/L
5
4
3
2
1
0
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
1-May-20
1-Jun-20
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date

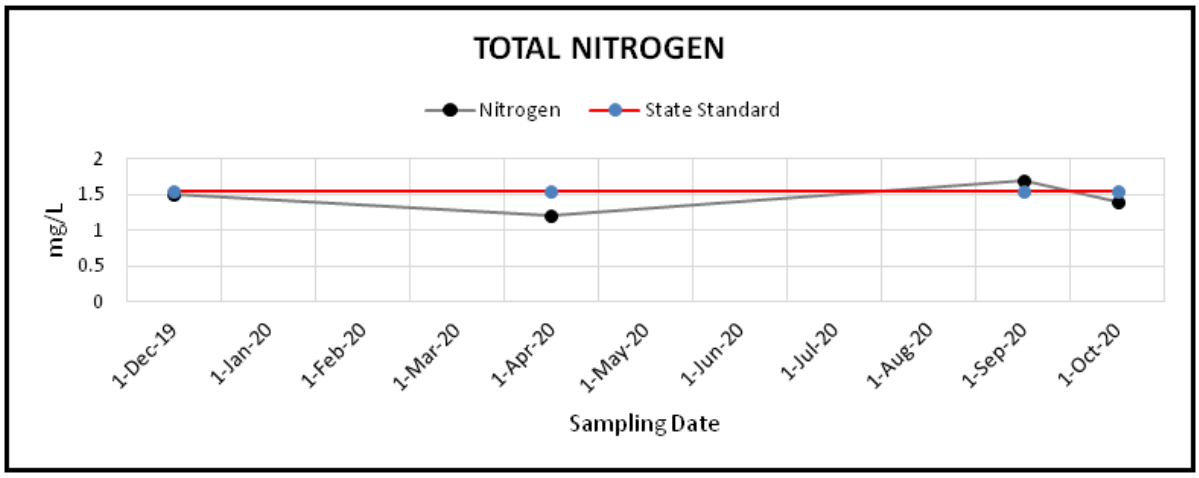

TOTAL PHOSPHORUS
Phosphorus
State Standard
mg/L
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
1-May-20
1-Jun-20
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date

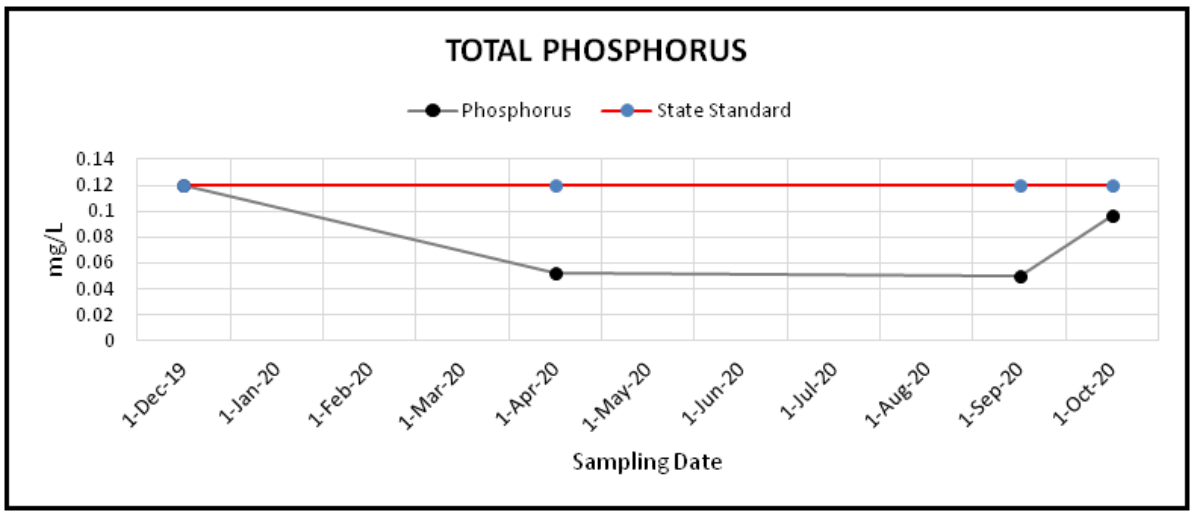


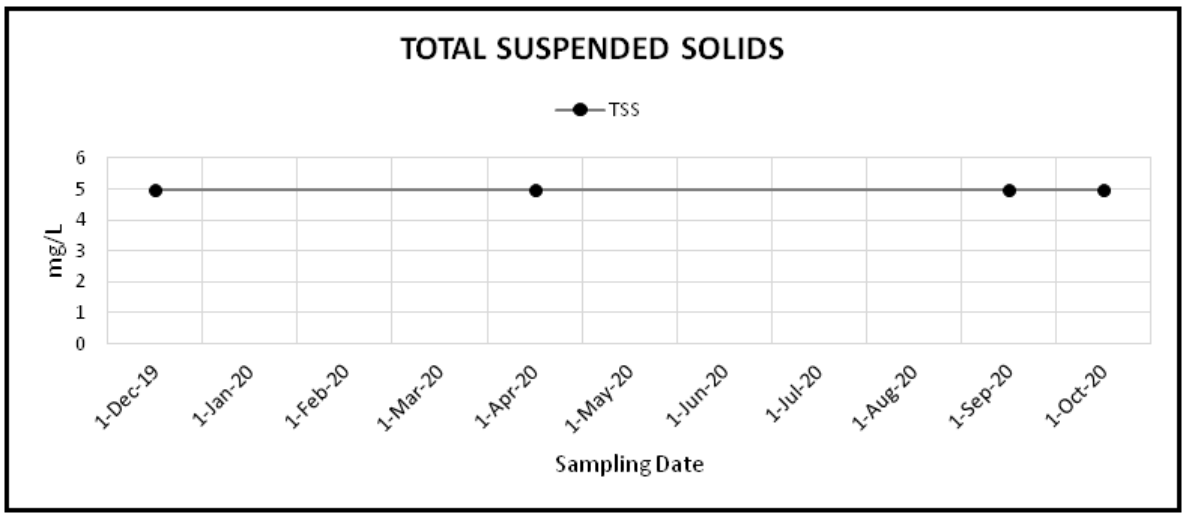
Location #2 Data and Plots

Location #2 Business District US Highway1	Chlorophyll- a ug/l	Total Nitrogen mg/l	Total Phosphorus mg/l	Total Suspended Solids mg/l	Dissolved Oxygen % Saturation
State Standard Criteria	20	1.54	0.12	N/A	N/A
December 19, 2019	2.2	1.5	0.12	5.0	No Data
April 17, 2020	3.0	1.2	0.052	5.0	No Data
September 1, 2020	1.0	1.7	0.050	5.0	No Data
October 2, 2020	1.0	1.4	0.097	5.0	No Data



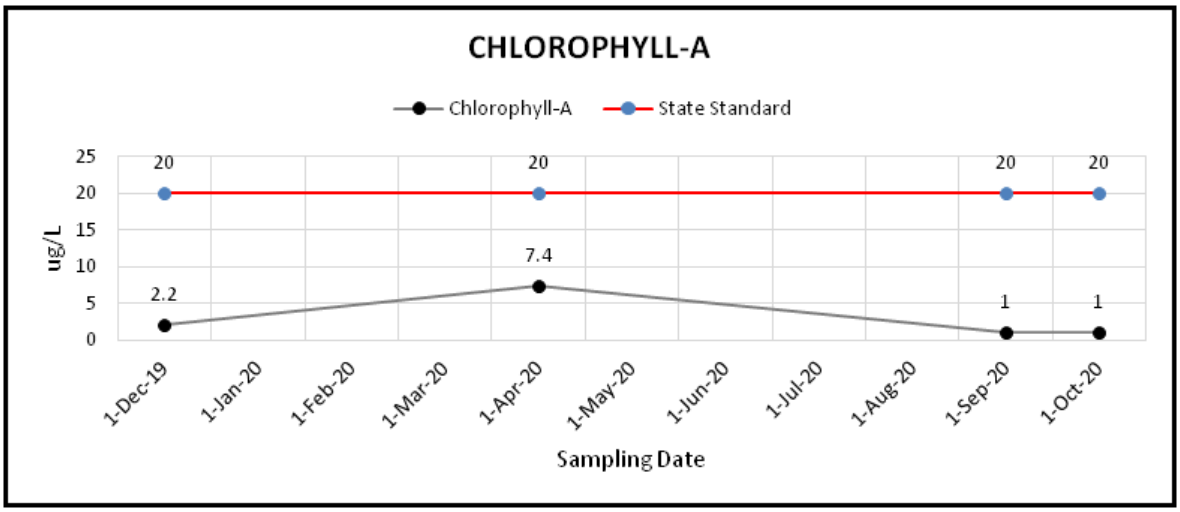

TOTAL NITROGEN
Nitrogen
State Standard
mg/L
2
1.5
1
0.5
0
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
1-May-20
1-Jun-20
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date

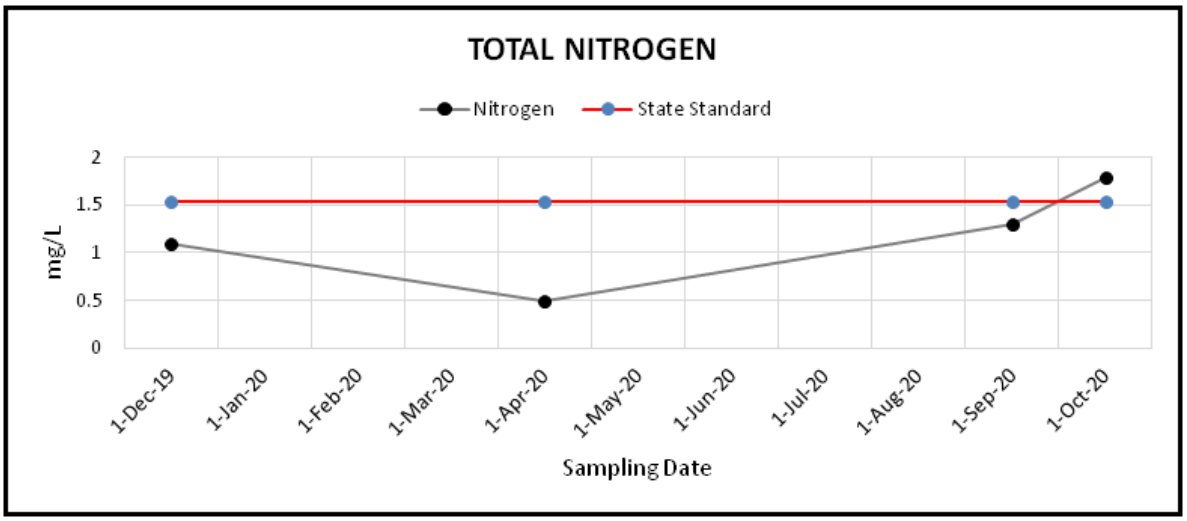

TOTAL PHOSPHORUS
Phosphorus
State Standard
mg/L
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
1-May-20
1-Jun-20
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date

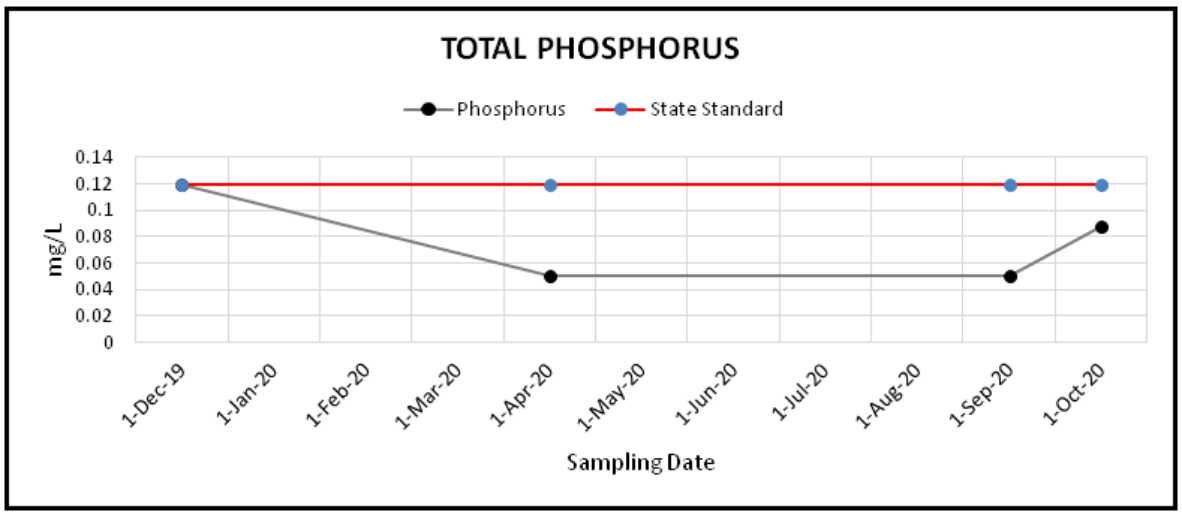

TOTAL SUSPENDED SOLIDS
TSS
mg/L
6
5
4
3
2
1
0
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
1-May-20
1-Jun-20
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date

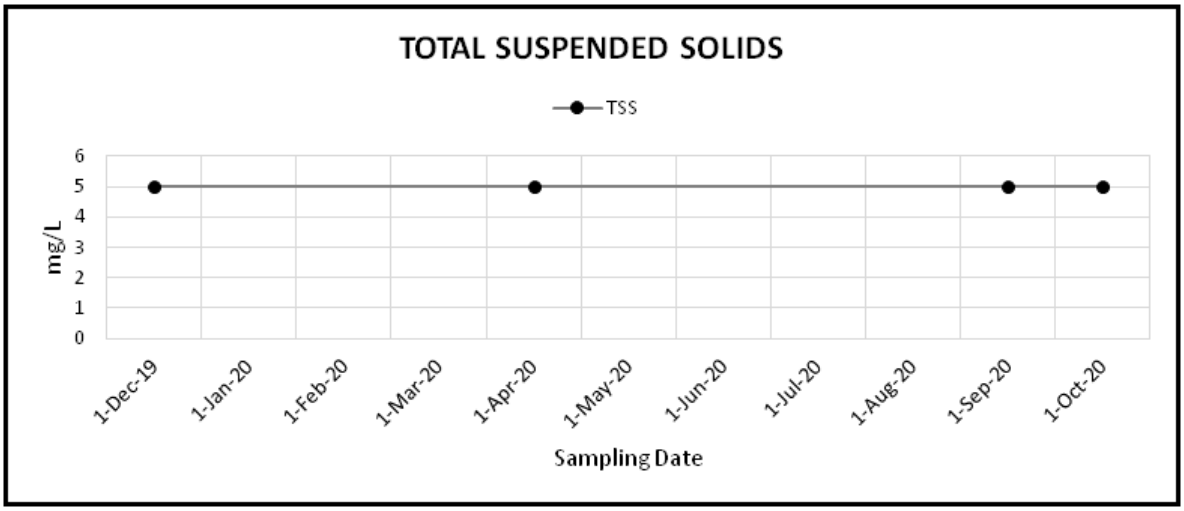
Location #3 Data and Plots

Location #2 Business District US Highway1	Chlorophyll-A ug/l	Total Nitrogen mg/l	Total Phosphorus mg/l	Total Suspended Solids mg/l	Dissolved Oxygen % Saturation
State Standard Criteria	20	1.54	0.12	N/A	>38
December 19, 2019	2.2	1.5	0.12	5.0	No Data
April 17, 2020	3.0	1.2	0.052	5.0	No Data
September 1, 2020	1.0	1.7	0.050	5.0	No Data
October 2, 2020	1.0	1.4	0.097	5.0	No Data



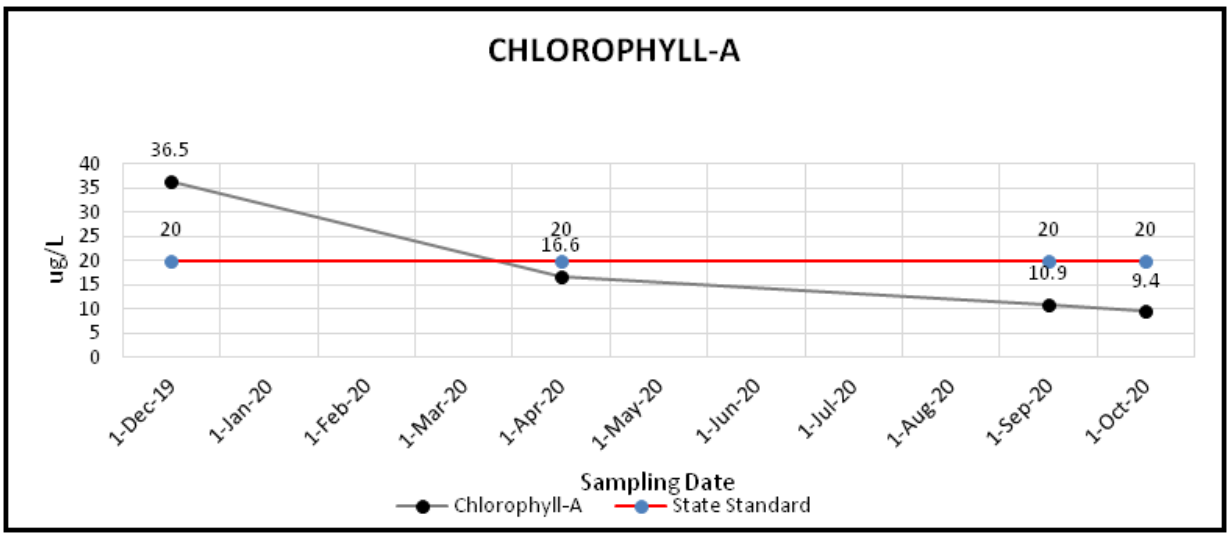






Location #4 Data and Plots

Location #4 Residential district south of South Lake	Chlorophyll- a ug/l	Total Nitrogen mg/l	Total Phosphorus mg/l	Total Suspended Solids mg/l	Dissolved Oxygen % Saturation
State Standard Criteria	20	NA	NA	N/A	>38
December 19, 2019	36.5	0.9	0.051	6.9	No Data
April 17, 2019	16.6	0.96	0.050	5.0	No Data
September 1, 2020	10.9	31.8	0.10	5.0	No Data
October 2, 2020	9.4	0.64	0.050	5.0	No Data


CHLOROPHYLL-A
ug/L
40
35
30
25
20
15
10
5
0
36.5
20
20
16.6
20
10.9
20
9.4
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
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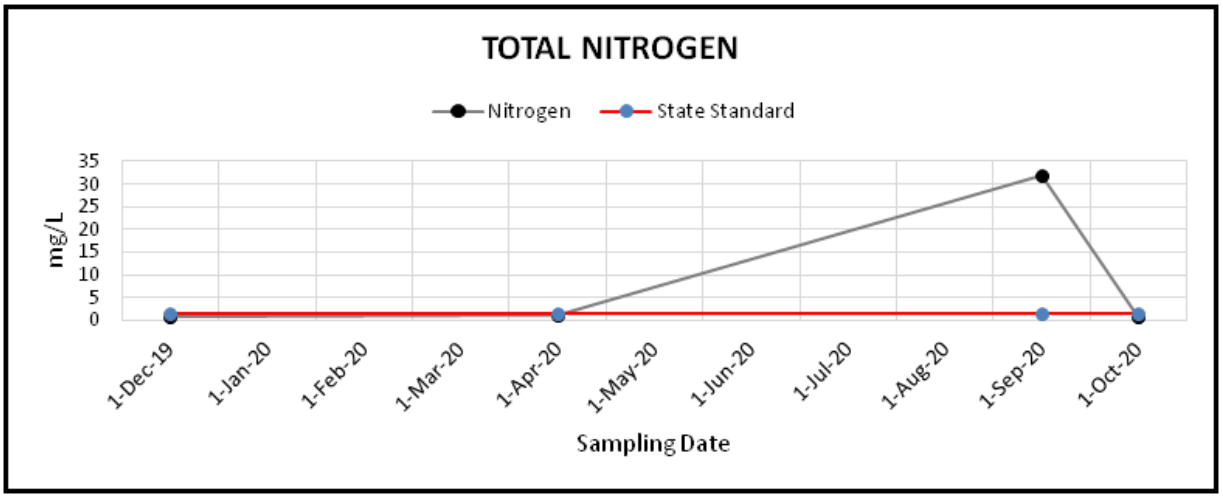
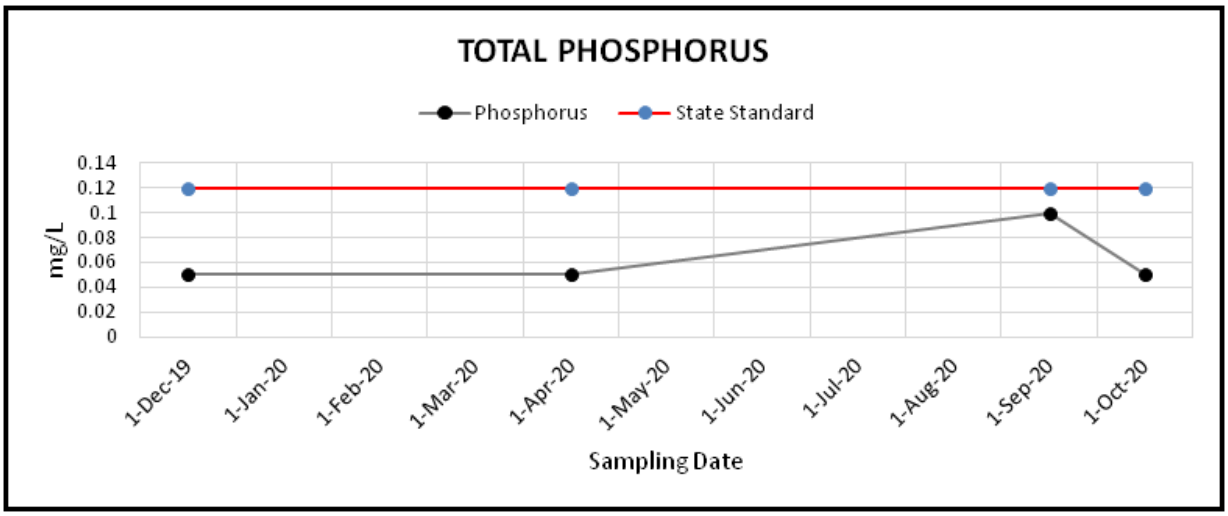
1-Sep-20
1-Oct-20
Sampling Date
Chlorophyll-A
State Standard


TOTAL NITROGEN
Nitrogen
State Standard
mg/L
35
30
25
20
15
10
5
0
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
1-Apr-20
1-May-20
1-Jun-20
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date


TOTAL PHOSPHORUS
Phosphorus
State Standard
mg/L
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1-Dec-19
1-Jan-20
1-Feb-20
1-Mar-20
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1-May-20
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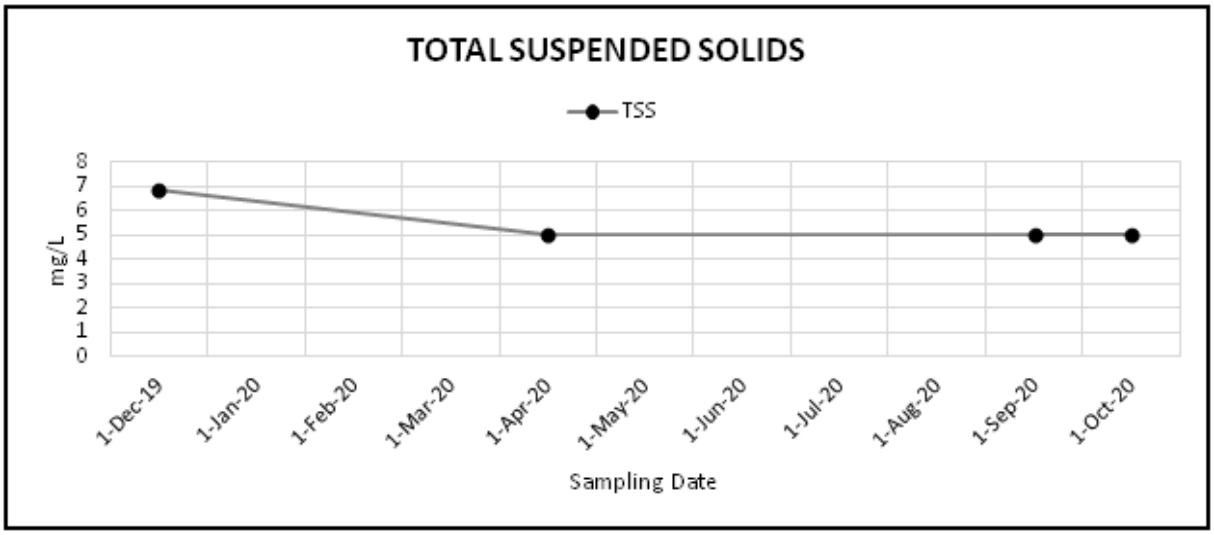
1-Jul-20
1-Aug-20
1-Sep-20
1-Oct-20
Sampling Date



2.7 Water Quality Monitoring Results – Trend Analysis Basis and Water Quality Parameters

Trend analysis involves the collection of information from varying time periods and plotting the information for detail analysis to spot patterns of change in the collected information. A primary objective of most long-term environmental water quality monitoring surveys is to detect and estimate trends in the parameters that are measured over a significant period of time.

The data to be analyzed in the trend analysis is for the period from 10/2019 to 9/2020. The short-term monitoring can be used to detect subtle changes in environmental parameters that can indicate an upcoming event such as Algal Bloom from spike in Nutrient Loads.

There are specific water quality parameter characteristics that can be applied to assess trends in water quality discharges to the LWL.

Chlorophyll- a is a measure of the number of algae growing in a waterbody. It can be used to classify the trophic condition of a waterbody. Although algae are a natural part of freshwater ecosystems, too many algae can cause aesthetic problems such as green scums and bad odors and can result in decreased levels of dissolved oxygen. One of the symptoms of degraded water quality condition is the increase of algae biomass as measured by the concentration of Chlorophyll-a. Waters with high levels of nutrients from fertilizers, septic systems, sewage treatment plants and urban runoff may have high concentrations of Chlorophyll-a and excess amounts of algae.

Nitrogen is an essential nutrient for plants. Small amounts of Nitrogen are a natural component of ecosystems, but agricultural and urban land use can add more nitrogen to waterways such as the LWL. Trends in three indicators of Nitrogen are very important for maintaining a healthy LWL habitat: total nitrogen, nitrate-nitrogen and ammoniacal nitrogen. Too much total nitrogen and nitrate-nitrogen can lead to excessive growth of algae, which can deteriorate river habitats. Nitrate-nitrogen and ammoniacal nitrogen can be toxic to aquatic life.

Agricultural activities, primarily row crop and livestock production, account for over 80 percent of all Nitrogen added to the environment. Non-agricultural sources of Nitrogen contribute less than 20 percent of the Nitrogen released into the environment. Six percent is released from point sources (such as outfalls) into water bodies, while fourteen percent is deposited from atmospheric sources. The typical sources of Nitrogen pollution in urban areas such as the Town of Lake Park include fertilizer use on lawns, septic tank sewage disposal, and leaks from sewer lines.

Phosphorus. Runoff from both urban and rural areas is loaded with nutrients such as phosphorus and nitrogen. Phosphorus is the nutrient of greatest concern because it promotes weed and algae growth in lakes and streams and waterways such as the LWL. Typically, phosphorus concentrations are lower in urban runoff than in rural runoff, but annual phosphorus loads. However, because phosphorus compounds attach to soil particles, urban areas with high sediment loads also produce high phosphorus load which mean that urban construction sites are significant sources of sediments and phosphorus loads. Other sources of phosphorus include fertilizer spills, leaves and grass left on paved areas, and orthophosphate in vehicle exhaust

Total Suspended Sediments (TSS). Total suspended solids (TSS) are the dry weight of suspended particles, that are not dissolved in water. TSS are particles that are larger than two (2) microns found in the water column. Anything smaller than 2 microns (average filter size) is considered a dissolved solid. Most suspended solids are made up of inorganic materials. These solids include debris drifting or floating in the water, sediment, silt, and sand to plankton and algae. Organic particles from decomposing materials can also contribute to the TSS concentration. As algae, plants and animals' decay the

decomposition process allows small organic particles to break away and enter the water column as suspended solids

TSS is a water quality parameter used to assess the quality of a specimen of any type of water or waterbody such as the LWL. It is a significant factor in observing water clarity and the more solids present in the water, the less clear the water will be. Some sediment will settle to the bottom of a body of water, while others remain suspended. Some suspended solids can settle out into sediment at the bottom of a body of water over a period of time. Although this settling improves water clarity, the increased silt can smother benthic organisms and eggs.

The flow rate of the water body is a primary factor in TSS concentrations. Fast running water can carry more particles and larger-sized sediment. Heavy rains can pick up sand, silt, clay, and organic particles (such as leaves, soil, tire particles) from the land and carry it to surface water. A change in flow rate can also affect TSS. TSS is listed as a conventional pollutant in the U.S. Clean Water Act and a major source of water quality degradation as the sediment load becomes the transport mechanism for pollutants from upland urban /suburban watersheds such as the Town of Lake Park.

Concentrations of TSS in urban stormwater runoff are highly variable. Concentrations are similar across different land uses. A state standard has not been established in Florida. **Figure 12** includes data from the International Stormwater Database, May 2011 edition.

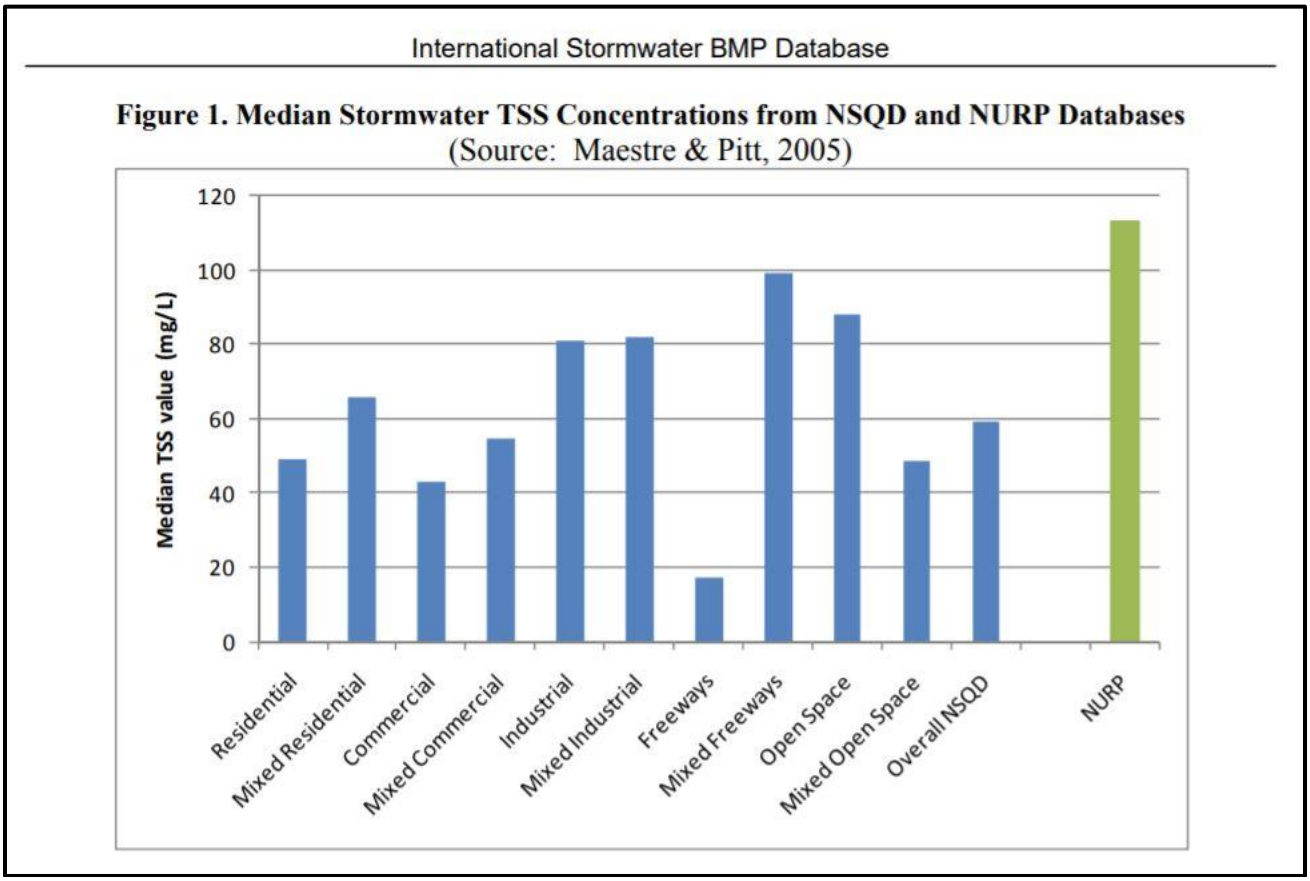


Figure 12. Land Use TSS Concentrations - International Stormwater Database, May 2011

Dissolved Oxygen

The dissolved oxygen (DO) is oxygen that is dissolved in water. The oxygen dissolves by diffusion from the surrounding air and as a waste product of photosynthesis. The concentration of dissolved oxygen in surface water is affected by temperature and has both a seasonal and a daily cycle. Cold water can hold more dissolved oxygen than warm water. In winter and early spring, when the water temperature is low, the dissolved oxygen concentration is high. In summer and fall, when the water temperature is high, the dissolved-oxygen concentration is often lower.

Dissolved oxygen in surface water is used by all forms of aquatic life; therefore, this constituent typically is measured to assess the "health" of waterbodies such as the LWL. Oxygen enters a stream from the atmosphere and from groundwater discharge. Photosynthesis is the primary process affecting the dissolved oxygen/temperature relation; water clarity and strength and duration of sunlight, in turn, affect the rate of photosynthesis.

In a stable body of water with no stratification, dissolved oxygen will remain at 100% air saturation. 100% air saturation means that the water is holding as many dissolved gas molecules as it can in equilibrium.

2.8 Trend Analysis for Town of Lake Park Sampling Locations

Chlorophyll- a

The Florida State Standard for Chlorophyll- a is 20 ug/l.

Typical low values ranging from 1.0. to 7.4 ug/l were registered at sampling locations 1, 2 and 3. Sampling location 4 Chlorophyll- a values ranged from 9.4 to 36.5 ug/l at the December 19, 2019 sampling event.

As stated in the preceding section, the Chlorophyll- a concentration at the sampling site 4 location was believed to be influenced by high nutrients (algae mats occurring at the downstream end of the discharge. A recommendation was made to switch the sampling to the upstream side of the weir control structure to test the hypothesis that lower Chlorophyll- a concentration would be obtained.

The 12/19/2019, 4/17/2020 and 09/01/2020 were sampled by graving a sample on the upstream side of the control structure. **Table 1** shows a comparison of the Cycle 4, Year 3 and Cycle 4, Year 4 Chlorophyll-a sampling results at this location.

High Chlorophyll- a concentration values were obtained during the December 19, 2019 and the April 17,2020 sampling events indicating that that the results were inconclusive to prove that switching the grab sample to the downstream side of the weir would produce lower Chlorophyll-a values.

Table 1 includes the AGM values for the Cycle 4, Year 3 and Cycle 4, Year 4. These AGM values indicate that although individual Chlorophyll- a Concentrations higher than 20 ug/l were obtained during sampling the Cycle 4, Year 3 AGM of 14.3 and the Cycle 4, Year 4 AGM value of 15.8 were below the allowable AGM limit of 20 ug/l.

Table 1 - Comparison of Chlorophyll- a Concentration Sampling Results		
Sampling Dates	Cycle 4, Year 3	Cycle 4, Year 4
March 21, 2019	24.8	
April 17, 2020		16.6
July 1, 2019	15.0	
August 23, 2019	10.9	
September 1, 2020		10.9
September 20, 2019	10.3	
October 2, 2020		9.4
December 19, 2019		36.5
AGM per Cycle	**14.3**	**15.8**

It was observed during the sampling that the water levels on both sides of the weir were very close. This indicates that backflow from the receiving lakes could be possible and responsible for the Chlorophyll-a concentration spikes. This is supported by the fact that Chlorophyll-a concentration values at all other Town sampling locations do not exceed 8 ug/l.

The next step is for the Town Public Works Department to make a recommendation to the management of the San Marco Villa residential development for implementation of more robust Best Management Practices (BMPs) to control nutrient/sediments loads to the stormwater management lakes. This will also reduce future pollutant discharges to the C-17 Canal, Earman River and LWL.

Total Nitrogen (TN)

Review of the Total Nitrogen records at all Locations indicate that all values were below the 1.54 mg/l state standard with the exception of two sampling event: September 1, 2020 (4.2 at site 1, 1.7 at site 2, 31.8 at site 4, and the October 2, 2020 event (1.8 at site 3).

Examination of rainfall records at the nearby SFWMD S-44 meteorological station indicated that approximately 1.5 inches of rainfall was recorded for the period of August 28, 2020 to September 2, 2020. It is very likely that nutrients from fertilizers at the sites 1 and 2 residential areas and at the heavily landscaped areas of the Commercial District of site 4 were responsible for the high TN at these sites after this relatively high rainfall storm event. However, the 31.8 mg/l at the site location is exceedingly high.

A request was made to PACE to assess whether the Site 4 TN of 31.8 mg/l was an error or whether it could be explained. PACE indicated that after review, no error was found, and that the sample had to be diluted due to the high concentration. A TN spike due to 1.5 inches of rainfall is not warranted. The most reasonable explanation is still related to the observed large algae mats in the receiving lakes. A recommendation will be made to the San Marco Villa residential development management to address the current nutrient concentrations at these lakes.

Total Phosphorus (TP)

All location experienced TP concentrations lower than the state standard of 0.120 mg/l. However, sampling locations 2 and 3 measurements reflected higher values of 0.12 mg/l for the December 19, 2019 sampling event. Review of rainfall records at the SFWMD S-44 meteorological station for the 12/19/2019 sampling date indicate normal rainfall. However, a week before on 12/07/2019 2.6 inches fell on the Town. It is likely that fertilizer spills, leaves and grass left on paved areas, and orthophosphate in vehicle exhaust were responsible for these higher TP concentrations as the various forms of phosphorus (Ortho) takes a while to leach from the soils into the water column.

Total Suspended Sediments (TSS)

TSS concentration values of 5.00 mg/l were recorded at all sampling locations with two exceptions. Site 1 recorded a TSS value of 9 mg/l for the April 17, 2020 event and site 4 registered a TSS value of 6.9 mg/l for the December 19, 2019.

Examination of rainfall records at the nearby SFWMD S-44 meteorological station indicated that approximately 3.1 inches of rainfall was recorded for the period of April 16 to 17, 2020. This rainfall volume and the resulting runoff could be responsible for the higher TSS values at sampling site 1 (The MH at 2nd Street where the sampling is performed is the lowest spot in the road).

These values are all below the median TSS value of 50 mg/l for the International Stormwater database but higher than the LWL median trending value 0f 7.8 mg/l for the LWL North segment (Figures 4 and 12).

The LWL Management Plan indicates that while salinity fluctuations are a problem with freshwater discharges, a major threat to the recovery of the LWL is excess suspended sediments. There is a need to reduce the TSS levels from the Town stormwater discharges, and this goal in being addressed in the proposed Town of Lake Park Stormwater Management Plan Update including the Town-wide implementation of Green Infrastructure Best Management Practices.

Dissolved Oxygen

Dissolved Oxygen values were not obtained during the 10/1/2019 to 9/31/2020 sampling period. However, an empirical analysis assessment of the DO value can be obtained by the use of EPA-approved charts using the temperature of the water and barometric pressure during the sampling event. For non-hurricane barometric pressure and temperatures in the 75 to 95-degrees F, values of DO saturation of nearly 100% are obtained. These are well above the >38 % saturation recommended, which is indicative that the Town of Lake Park enjoys stable surface water domains with no significant stratification and where dissolved oxygen will remain at 100% air saturation.

3. POLLUTANT LOADING ESTIMATE PLAN

Figure 13 shows that the Town of Lake Park MS4 areas as a function of the receiving water bodies for which pollutant discharges are being monitored as part of the Palm Beach County NPDES Group permit. The western MS4 areas discharge toward the C-17 Canal, and the eastern MS4 areas toward the Earman River/Lake Worth Lagoon (LWL). The total Tow of Lake Park MS4 areas are:

- MS4 Area to Earman River/ LWL: 687.90 acres or 87.9 % of the total LWL MS4 area of 782.11 acres
- Area to C017 Canal: 94.21 acres or 12.1% of the total Basin MS4 area of 782.11 acres

The purpose of the Town of Lake Park Water Quality Assessment Program, as a participant within the Palm Beach County NPDES/MS4 Group Permit, is to provide information for the Town of Lake Park to

determine the overall effectiveness of its Stormwater Management Program (SWMP) in reducing stormwater pollutant loadings from its Municipal Storm Sewer System (MS4) to the C-17 and LWL receiving water bodies.

The sampling data collected by the Town of Lake Park, as well as data collected by other municipalities, has been applied by the Palm Beach County MS4 permittee group to develop pollutant loading estimates during the third year of this permit cycle. The Spatially Integrated Model for Pollutant Loading Estimates (SIMPLE) SIMPLE protocol has been applied to calculate pollutant loads.

Pollutant loading estimates are calculated by the SIMPLE water quality model using flow-weighted average concentration or Event Mean Concentration (EMC) for each pollutant of interest. EMC values are defined as the total load of a given pollutant divided by the total runoff volume for a storm event. These values are derived from watershed monitoring, and sampling stormwater during rain events. **Figure 14** shows the EMC values used in the SIMPLE water quality model for Cycle 4 (Table 5 of the Joint Annual Report, Cycle 4 -Year 3).

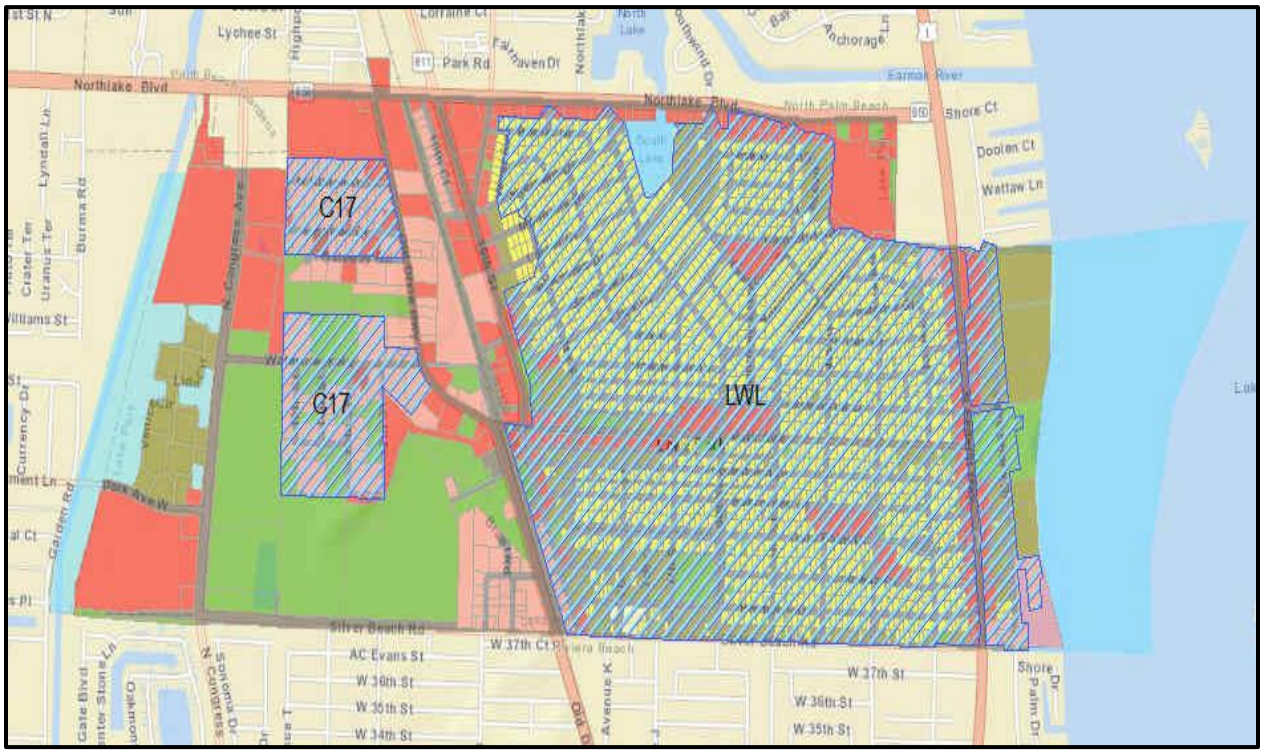


Figure 13. Town of Lake Park NPDES/ MS4 Areas

The Palm Beach County MS4 permittee group provided in the Joint Annual Report, Cycle 4 Year 3 pollutant estimates by MS4 areas in addition to by regional watershed that reflect the respective permittee's MS4 area pollutant discharges. Pollutant load estimates were provided for the following parameters: Biochemical Oxygen Demand (BOD), Copper (Cu), Total Nitrogen (TN), Total Phosphorus (TP), Total suspended Solids (TSS), Zinc (Zn). The pollutant estimates are only provided by the group in tear 3 of the cycle and the Cycle 4 Year 3 pollutant estimates will also be used for this report in year 4 of Cycle 4.

Table 5 Event Mean Concentration for Parameters by Land Use (mg/l)

Land Use	TN	TP	TSS	BOD5	Cu	Zn
Agricultural/Crop Land	2.67	0.89	19.8	3.8	0.022	0.030
Agricultural / Improved Pasture	2.3	0.44	94.3	5.1	0.013	0.021
Commercial	1.79	0.26	57.5	7.7	0.018	0.094
Forest / Open	1.15	0.06	8.4	1.4	0.013	0.021
Golf Course	2.07	0.33	37.5	7.9	0.016	0.062
Highways / Major	1.2	0.2	37.3	5.2	0.032	0.126
Industrial	1.2	0.26	60.0	7.6	0.003	0.057
Residential / Low Density	1.61	0.19	23.0	4.7	0.008	0.031
Residential / Medium Density	2.07	0.33	37.5	7.9	0.016	0.062
Residential / High Density	2.32	0.52	77.8	11.3	0.009	0.086
Residential / with Equestrian	3.45	0.5	69.1	4.7	0.008	0.031
Water	0.84	0.11	11.0	3.0	0.001	0.006
Wetland	1.01	0.05	11.0	3.0	0.001	0.006

Figure 14. Event Mean Concentrations

The Annual Report, Cycle 4-Year 3 also includes pollutant loading data for the Cycle4 Year 2 for comparison between the 2013 And 2018 reporting cycles. **Figure 15 and 16** show pollutant loadings discharged to the C-17 and LWL regional watersheds provided in Tables 12 and 13 of the Annual report. A comparison of the loadings in Table 12 and 13 for the C-17 and LWL MS4 areas indicates a trend of lower pollutant loads from 2013 to 2018 (Approximately 2%).

Table 12 Loading Estimates Cycle 3 Year 3 in mg/L

Watershed	BOD_5 Cycle 3 Year 3	TSS Cycle 3 Year 3	TP Cycle 3 Year 3	CU Cycle 3 Year 3	ZN Cycle 3 Year 3	TN Cycle 3 Year 3
C15	1,085,890	3,780,619	47,511	2,491	11,414	428,992
C16	1,319,230	4,294,861	55,301	2,817	13,229	613,163
C17	746,421	3,001,973	30,455	1,762	8,095	306,205
C18	1,795,960	5,281,837	55,081	2,234	9,914	716,469
C51	3,015,247	9,577,086	137,506	6,440	28,706	1,770,218
Hillsboro	954,749	3,768,384	44,540	2,341	10,028	349,585
ICWWN	441,016	1,365,455	17,839	1,002	4,522	195,209
ICWWS	278,171	1,471,489	13,128	683	2,986	108,085
L8	2,226,117	7,363,771	83,490	2,829	10,963	931,902
LOX	746,513	2,390,398	33,363	1,554	6,224	456,387
LWL	727,658	3,479,044	33,667	1,579	6,984	289,708
S-2_6_7	3,001,967	10,348,659	316,928	10,656	29,755	1,702,345
WPBWS	516,116	1,628,588	16,166	588	2,558	202,132

Figure 15. C-17 and LWL Pollutant Loadings for Cycle 4 Year 2

Table 13 Loading Estimates Cycle 4 Year 3 in mg/L

Watershed	BOD_5 Cycle 4 Year 3	TSS Cycle 4 Year 3	TP Cycle 4 Year 3	CU Cycle 4 Year 3	ZN Cycle 4 Year 3	TN Cycle 4 Year 3
C15	1,035,576	3,308,847	45,366	2,322	10,456	422,172
C16	1,314,644	4,201,904	54,807	2,756	13,003	612,669
C17	748,576	2,933,718	30,944	1,702	7,663	311,079
C18	1,747,703	5,093,882	54,145	2,204	9,693	693,855
C51	2,990,483	9,387,559	136,117	6,332	28,061	1,725,169
Hillsboro	943,216	3,640,819	44,011	2,246	9,554	348,386
ICWWN	429,380	1,229,472	17,269	928	4,241	193,500
ICWWS	267,863	1,367,076	12,758	644	2,794	106,657
L8	2,225,830	7,361,863	83,488	2,828	10,957	931,884
LOX	709,032	2,038,886	31,659	1,456	5,840	439,785
LWL	718,096	3,395,653	33,279	1,543	6,818	285,882
S-2_6_7	3,021,209	10,444,784	317,153	10,652	29,783	1,706,412
WPBWS	515,843	1,626,169	16,161	586	2,545	202,125

Figure 16. C-17 and LWL Pollutant Loadings for Cycle 4 Year 3

The State of Florida allows for assumed pollutant loading reductions as a result of nonstructural BMPs such as public education and outreach (Up to 6%). These reductions, not included in the SIMPLE model used to calculate the pollutant loadings, are presented in **Table 2** below for the C-17 and LWL group pollutant load calculations comparison.

Table 2 – Regional Pollutant Load with Reductions for Non-Structural BMP Practices						
Watershed	**BOD_5**	**TSS**	**TP**	**CU**	**ZN**	**TN**
Cycle 3, Year 3						
C-17	701,636	2,821,855	28,628	1,656	7,609	287,833
LWL	683,998	3,270,301	31,647	1,484	6,565	272,326

Cycle 4, Year 3						
C-17	703,661	2,757,695	29,087	1,600	7,203	292,414
LWL	675,010	3,191,914	31,282	1,450	6,409	268,729
Net Percent Reduction (Increase) in Year 4						
C-17	+0.29	-2.27	+0.10	-3.38	-5.34	+1.59
LWL	-1.31	-2.40	-1.15	-2.29	-2.38	-1.33

The Annual Report, Cycle 4 -Year 3 also provides the local pollutant loading from each participating municipality MS4 area to C-17/LWL Watersheds. **Tables 3 and 4** includes pollutant loading information extracted from the Annual Report, Cycle 4 -Year 3 Tables 16 and 26 that is specific to the Town of Lake Park C-17 and LWL MS4 areas.

Tables 3 and 4 pollutant discharge data to the C-17 and LWL from the Town's MS4 areas has been adjusted for the non-structural BMPs (6%) as well as for the street sweeping program reduction of TP & TN in year 2 and 3 as follows:

Cycle 3 Year 3 - TP = 25lbs., TN= 39 lbs.

Cycle 4 Year 3 - TP = 28 lbs., TN= 44 lbs.

MS4 Basin	**Table 3 -2013 Pollutant Loading (Lbs./year)**					
	BOD_5	**TSS**	**TP**	**CU**	**ZN**	**TN**
LWL	21,129	117,324	920	62	266	6,357
C-17	4,849	33,188	160	13	53	1,325
Total	25,978	150,512	1,080	75	319	7,682

MS4 Basin	**Table 4 - 2018 Pollutant Loading (Lbs./year)**					
	BOD_5	**TSS**	**TP**	**CU**	**ZN**	**TN**
LWL	21,029	116,379	917	62	263	6,348
C-17	4,412	29,131	150	12	54	1,283
Total	25,441	145,510	1,067	74	317	7,631
Total Net Percent Reduction (Increase) in Year 4						
Net Total	**-2.07**	**-3.32**	**-1.20**	**-1.33**	**-0.63**	**-0 .66**

4. EVALUATION AND RESPONSE PLAN

Tables 3 and 4 indicate that the current Best Management Practices being applied in the form of dry/wet detention and retention, and street sweeping are having a positive although small (less than 3.5%) effect on decreasing pollutant loadings to the LWL.

Figure 17 shows the location of the current dry/wet detention BMPs that were used in the Group's SIMPLE model for pollutant load estimation reduction.

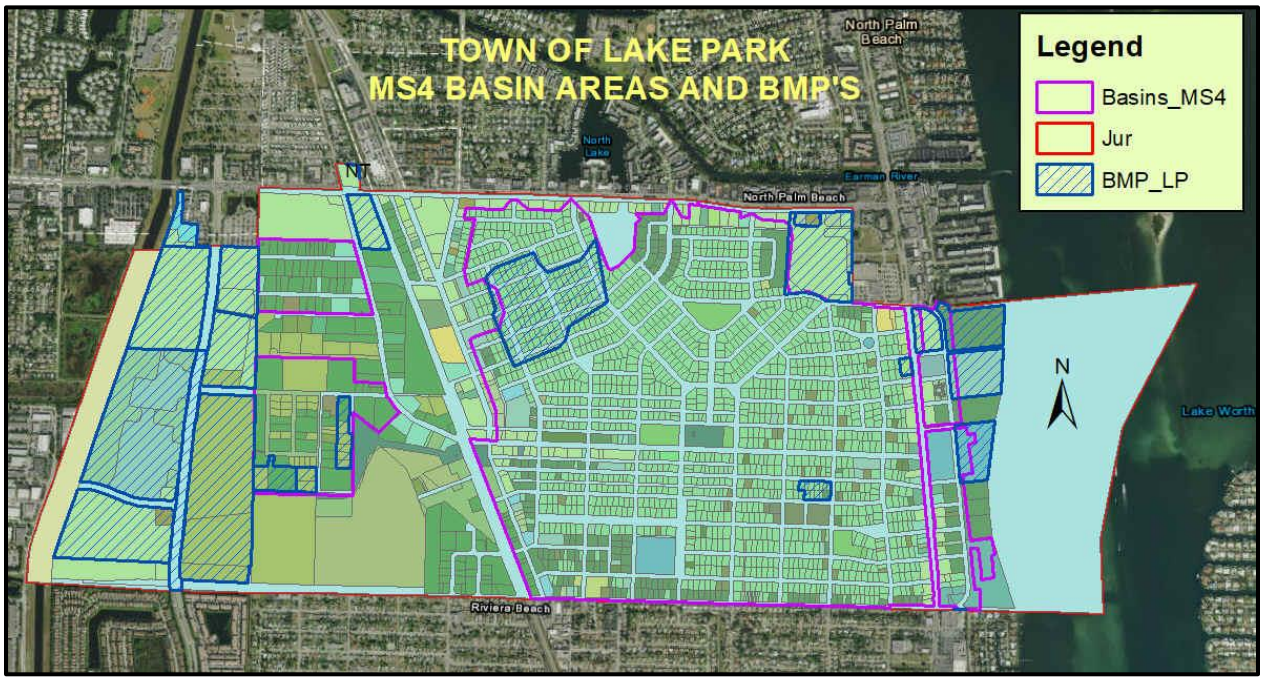


Figure 17. Current BMPs in the Town of Lake Park

Application of standard water quality BMPs in the previous reporting cycles has been moderately successful but it will not accomplish the long-term goals of the Palm Beach County MS4 permittee group to significantly improved the health of the Northern Lake Worth Lagoon. The implementation of additional and innovative water quality improvement programs by the participant C-17 Canal/Earman River Watershed is warranted.

To meet the long-term goals of Group the Town of Lake Park is currently in the process of updating the Stormwater Masterplan (SWMP) with the proposed implementation of Green Infrastructure Low Impact Development (GI/LID) Best Management Practices such as bioswales, raingardens, bioretention, pervious pavement and underground filtration chambers. It is expected that the implementation of GI

facilities Town-wide will significantly enhance the Plan's effort to reduce pollutant loading to the LWL north watershed.

To assess the potential impact of GI/LID BMP implementation at the Town of Lake Park MS4 areas, the Town's SWMP consultant has updated the Town's watershed basins from 25 to 174 discrete subbasins at the block inlet level. **Figure 18** shows the new Town basin/sub-basin map.

Figure 18. Updated Subbasins for the Town of Lake Park

Outfalls were also inventoried in detail and renumbered. **Figure 19** shows the updated outfall map.

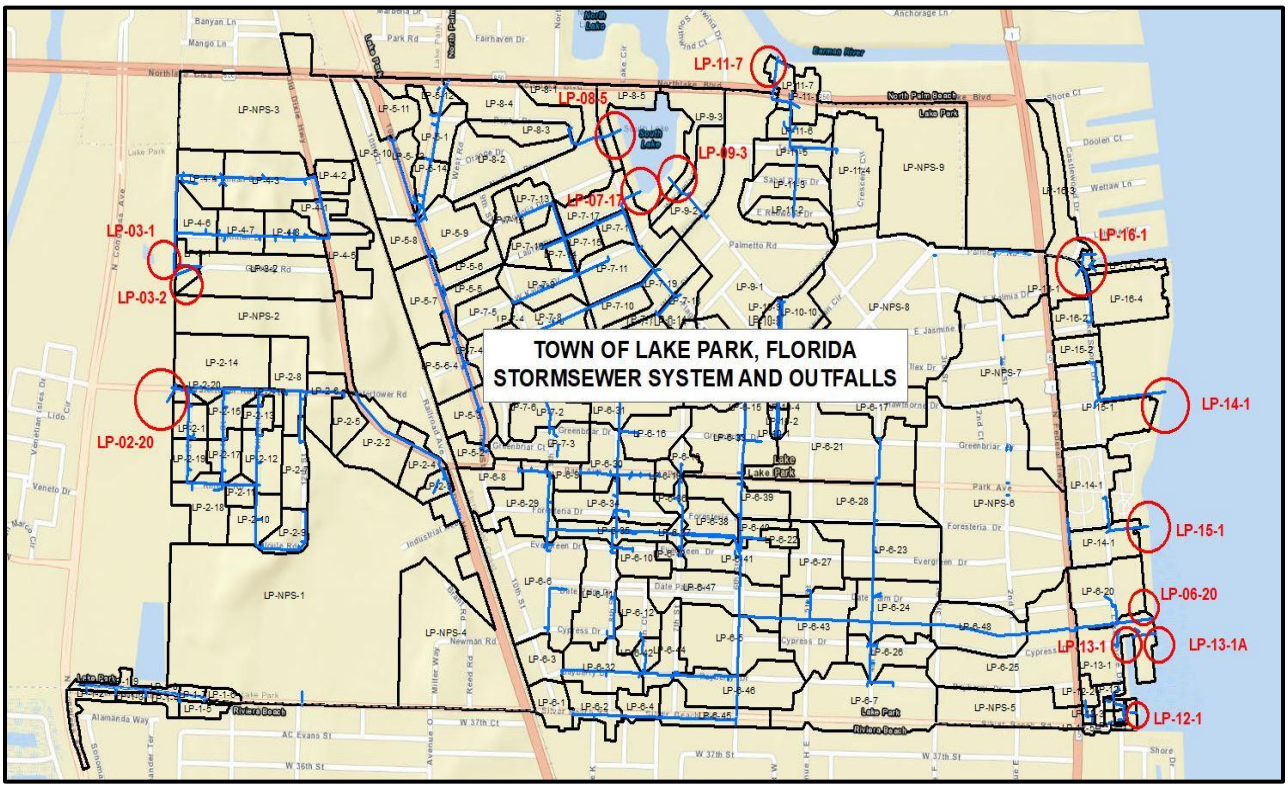


Figure 19. Updated Outfall map.

The number of outfalls increase from 11 to 14 and was reported in the audit of the Town of Lake Park NPDES/MS4 program in August 2020.

As previously stated, the sampling data collected by the Town of Lake Park, as well as data collected by other municipalities is applied by the Palm Beach County MS4 permittee group to develop pollutant loading estimates during the third year of this permit cycle. A new regional loading estimate will not be available in the Cycle 4, Year 4 period. However, the Town's consultant has obtained a copy of the Spatially Integrated Model for Pollutant Loading Estimates (SIMPLE) SIMPLE protocol to assess the effectiveness of the proposed SWMP GI/LID BMPs for various scenarios for pollutant load reductions. The models load reductions are also being used for FDEP grant applications.

Percent effectiveness for GI/LID-based BMPs such as bioswales, bio-detention and pervious pavement vary in the literature and is an ongoing field of research. Pollutant removal effectiveness for various GI/LID-based BMPs proposed for the Town of Lake Park are being developed using best available technical data from the FDEP and the University of Central Florida BMP Trains 2020 research for nutrients.

In the Cycle 4, Year 3 Annual Report it was stated that the Town SWMP update was considering various scenarios for GI/LID water quality improvement project implementation based on the physical availability of green areas and cost of implementation. One of these scenarios contemplated placing bioswales in approximately 5% of all road rights-of-way in the Town. **Figure 20** shows the extent of bioswale coverage per MS4 areas.

Figure 20. Additional Green Infrastructure-Based BMPs

It is expected that if approximately 5% of the total road green areas were to be converted to Bioswales and Biodetention facilities pollutant loading percent reductions efficiency to the LWL in the range of 50% to 75% could be obtained for all pollutant (based on initial BMP Trains simulations).

Figure 21 shows the two types of bioswales to be used throughout the Town for the dual purpose of flooding relief and runoff discharge and water quality enhancement.

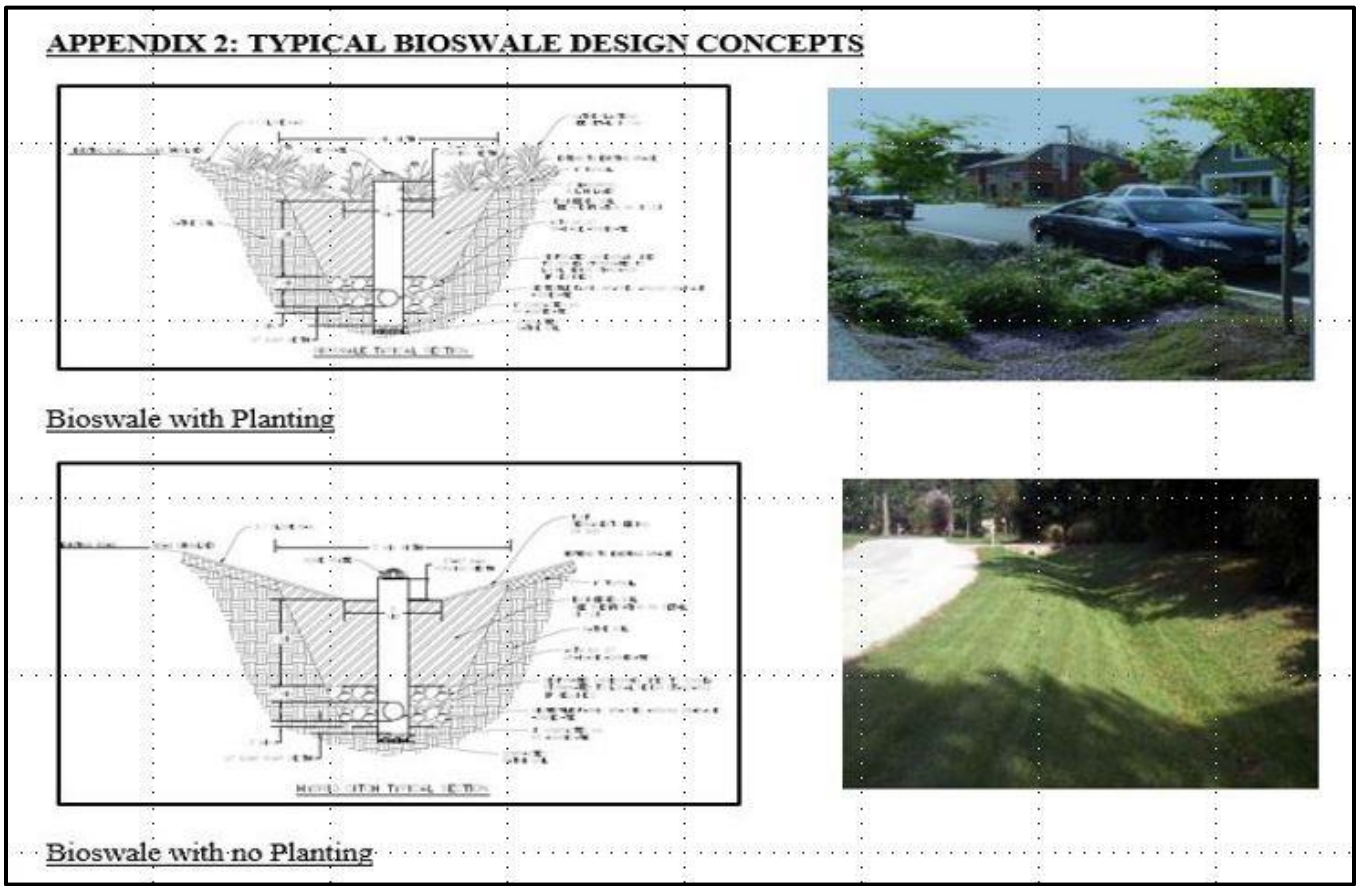


Figure 21. Types of Bioswale Design

The Town of Lake Park SWMP 2019-2020 update is now in full implementation and a number of GI/LID-based projects have been proposed for a five (5) year Capital Improvement Plan (CIP) program. The Town will be implementing these projects through its Stormwater Utility funding but mostly through grant acquisition. Below is the list of projects in the 5-year CIP.

2nd Street Corridor Flood Relief Bioswale Project. This division includes an area south of Palmetto Drive and north of Date Palm Drive between 2nd and 3rd Street that lacks a dedicated drainage collection system, and it is known to flood along the intersections of these roads. The placement of Bioswales at strategic locations to address these nuisance flooding locations is contemplated as part of the 20-year SWMP implementation plan. The project also enhances the treatment of roadway runoff prior to discharging to the linear stormsewer system and the LWL.

The 2nd St Corridor Project has been proposed for funding through the Florida Department of Environmental Protection Coastal partnership Grant Program. This grant application, submitted in October 2020, will be awarded in the first quarter of FY2021. **Figure 22** shows this project location.

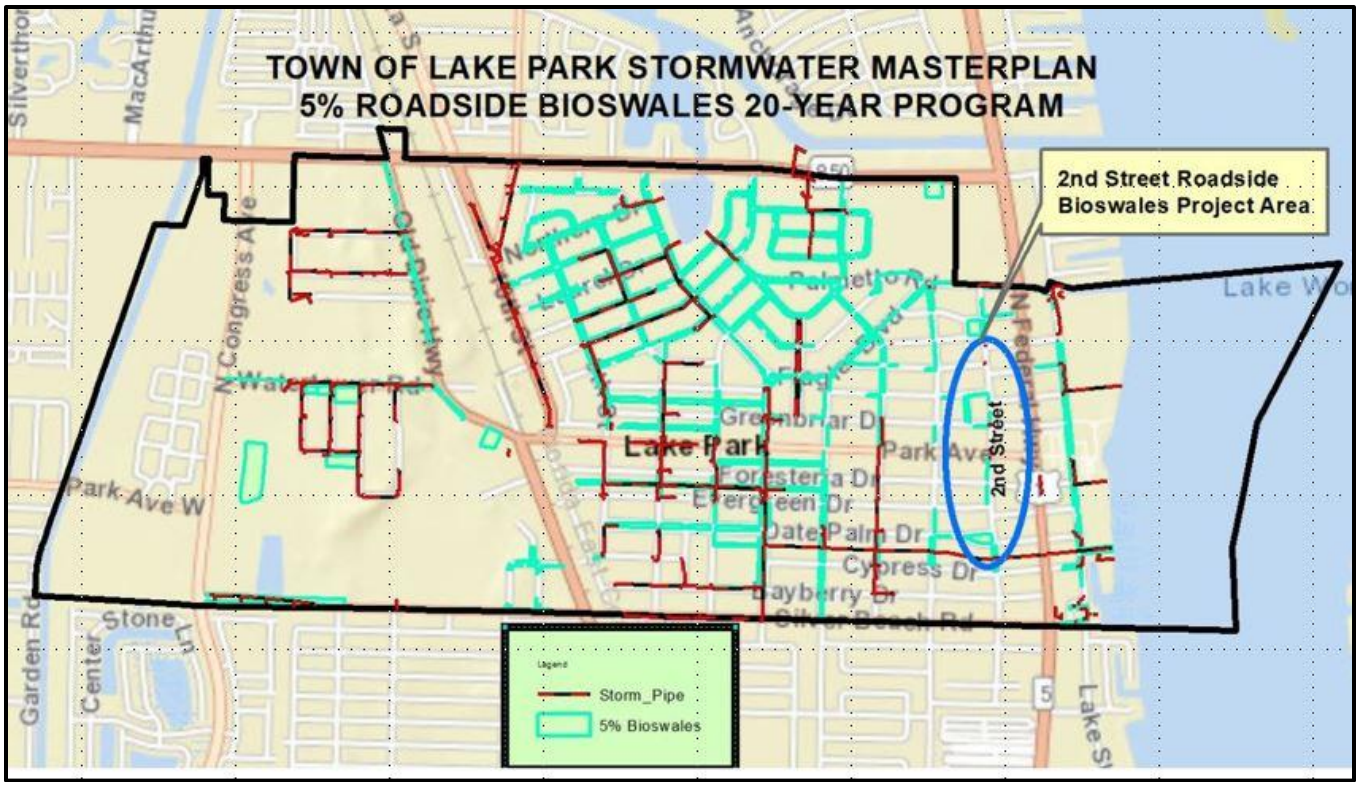


Figure 22. 2nd Street Bioswale Project Area

Southern Outfall Phase 2 (Upstream Diversion to Bert Bostrom Park Underground Storage Filtration facility). The goal of the Stormwater Masterplan is to decentralize the flow of stormwater runoff into the linear stormsewer network. The Southern Outfall Phase 2 project is located in the middle watershed area and entails a decentralization of the northern tributary network by redirection of the runoff discharges to a large system of underground chambers at Bert Bostrom Park located north of Bayberry Road (at 6th Street and Date Palm Drive). Presently, the lack of capacity in the main trunk of the Southern Outfall is reflected in inlet Bursting (backflow) in the mid-section of the stormsewer network with just small storm events. The proposed decentralization of the Southern Outfall northern/western tributary network will not only address this ongoing flooding situation, but it will significantly enhance the treatment of runoff prior to discharge to the LWL.

The project has been funded by the Town for Sixty percent (60%) of the project design cost. The cost of 100% plans will be funded through a Mitigation CDBG grant applied for in October 2020. **Figure 23** shows the Bert Bostrom Park Underground Storage Filtration facility project location.

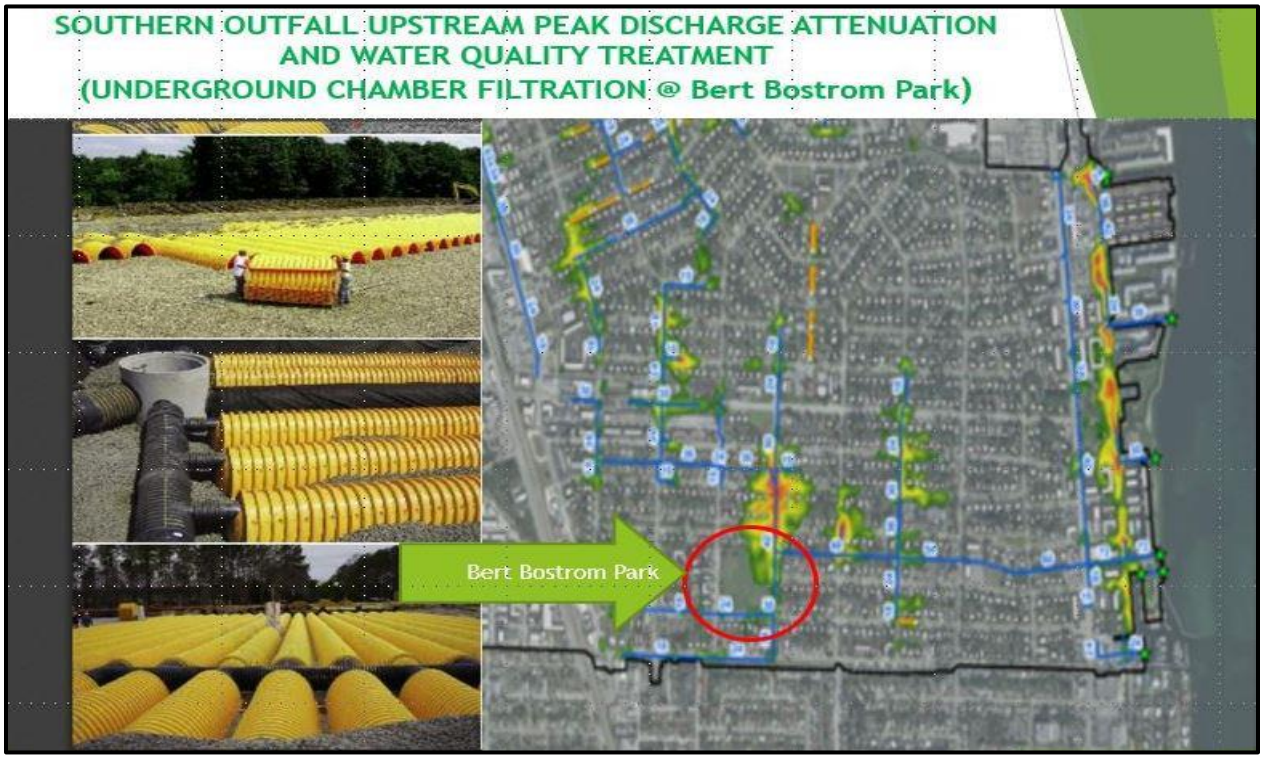


Figure 23. Bert Bostrom Park Underground Filtration Chambers Project Location

Town of Lake Park Municipal Complex Drainage Retrofit & Biodetention Facility Design Project. This project entails the provision of water quality treatment at the Town Hall Municipal complex along Park Avenue (Town Hall, Police Building, and Library). The complex currently discharges untreated runoff to a 24" RCP along a 6th Street stormsewer, part of the Southern Outfall Northern tributary.

Sixty percent (60%) of the project design cost will be funded through a Florida Department of Environmental Protection (FDEP) Coastal Resiliency Grant, applied for in October 2020. Grant funding is expected in the summer of FY2021. **Figure 24** shows the proposed GI/LID improvements.

Figure 24. Municipal Complex Water Quality Retrofit Project Using GI/LID BMPs

10th Street Green Infrastructure Pilot Water Quality Project. The 10th Street ROW is an ideal location as the ROW is located near the Town west ridge with higher elevations and significant underlaying sand formations for optimum bioswale infiltration. The Town has applied funding from the Stormwater Utility program for 60% plan design completion. The Town has applied for Mitigation CDBG grants to complete 100% design and implement the pilot BMP project along 0.45 miles of the 10 Street ROW in 2021/2022. **Figure 25** shows a typical ROW BMP layout for bioswales along the 10th Street Pilot project.

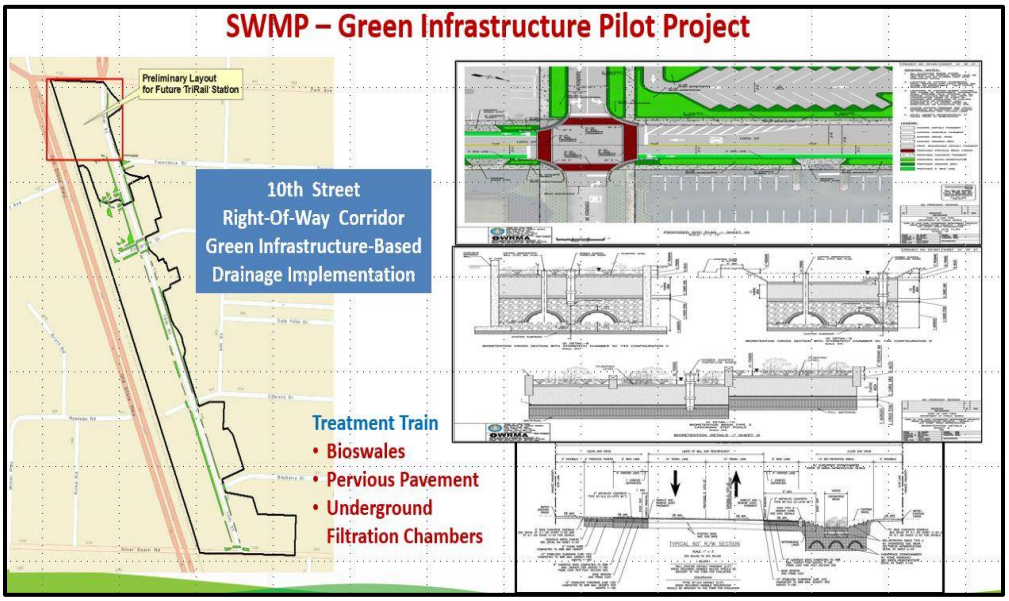


Figure 25. 10th Street Bioswales BMP Pilot Project layout

Figure 26. 72" CAP Outfall Replacement and Biodetention Facility

The Southern Outfall Phase 1 Priority Rehabilitation Project. This project includes the replacement of an aging and failing 72-inch corrugated aluminum pipe (CAP) discharging 446 acres of the Town's watershed area with an in-kind high-density polyethylene (HDPE) outfall, inline valve and Sea Level Rise pump station, and the placement of a large Biodetention facility for water quality treatment**. Figure 26** shows these improvements.

Applying the SIMPLE model with Cycle 4, Year 3 base data and EMC's, a pollutant load assessment of the efficiency of the proposed GI/LID–based water quality enhancement projects listed above was

performed. **Table 5** is a comparison of the pollutant load reductions using the BMP's applied to the model in 2018 and the additional BMP's currently considered (in design) in the comparison. The new Town SWMP sub-watershed area map was used to place the proposed dry detention/underground filtration and Biodetention BMP's. The SWMP 2020 update expanded the drainage basins areas from 25 to 174 discrete subbasins which make it a lot easier to accurately place the proposed water quality treatment BMP facilities in the SIMPPLE model BMP shapefile and associated access database. Because all of the proposed BMP's are located in the LWL MS4 area, Table 5 results only address the difference for pollutants in this MS4 basin.

As previously stated, the State of Florida allows for assumed pollutant loading reductions as a result of nonstructural BMPs, such as public education and outreach (up to 6%). These reductions are not included in the SIMPLE model used to calculate the pollutant loadings and the model results have been adjusted accordingly. The TN and TP values were also adjusted for the street removal pollutant loads in the Cycle 4, Year 3, and the Cycle 4, Year 4 reporting periods.

Cycle 4 Year 3 - TP = 28 lbs., TN = 44 lbs.
Cycle 4 Year 4 - TP = 25lbs., TN = 38 lbs.

MS4 Basin	**Table 5A - Cycle 4 Year 3 (2018 SIMPLE Pollutant Loading (Lbs./year)**					
	BOD_5	**TSS**	**TP**	**CU**	**ZN**	**TN**
LWL	22,418	98,253	883	54	262	10,630
MS4 Basin	**Table 5B - Cycle 4 Year 4 (WRMA 2021 SIMPLE Pollutant Loading (Lbs./year)**					
	BOD_5	**TSS**	**TP**	**CU**	**ZN**	**TN**
LWL	20,953	91,373	802	50	244	9,938
Total Net Percent Proposed Reduction						
Net Total	**-6.98**	**-7.0**	**-9.17**	**-7.40**	**-6.87**	**-6.50**

Table 5 indicates that if the four GI BMP facilities currently under design and construction in FY2021-2022 as part of the long term 5% plan are implemented. LWL pollutant load reductions in the range of 6.5% to 9.2% can be expected to occur. This indicates that the Towns surface water discharge MS4 permit will be significantly enhanced with the implementation of the 5% Roadside Bioswales GI-based long term 20-year program. As additional 5% plan BMP's are funded, designed, and implemented, the SIMPLE BMP

access GIS database will be updated accordingly for Cycle effectiveness and annual pollutant load reporting.