BEAUFORT COUNTY
STORMWATER UTILITY
120 Shanklin Road
Beaufort, South Carolina 29906
Voice (843) 255-2805 Facsimile (843) 255-9436

April 10th, 2021

Stormwater Utility Board April Packet

Table of Contents

BEAUFORT COUNTY
STORMWATER UTILITY
120 Shanklin Road
Beaufort, South Carolina 29906
Voice (843) 255-2805 Facsimile (843) 255-9436

April 10th, 2021

Stormwater Manager's Report for the Stormwater Utility Board Meeting

Utility Update

1. Southern Lowcountry Regional Board (SoLoCo)
   a) The current schedule for completion and finalization on the document and activities of Center for Watershed Protection (CWP) is as follows:

      All project milestones have been completed.

2. Regionalization
   a) Regional Stormwater Design Standard and Model Ordinance Project – See update above.
   b) Regionalization of programs – With the finalization of the Regional Stormwater Design Standard and Model Ordinance it is hoped each participating jurisdiction will adopt these policy documents for implementation to provide consistent administration of Stormwater Management guidelines and policies in the region. Discussions of a Regional Stormwater Authority to administer the adopted guidelines and policies holistically within the region/jurisdictions can be fostered.
   c) Implementation of new standards began on February 1st, 2021. At this time Staff have been working with several contractors on new requirements, but no submittals at this time.
   d) The technical subcommittee will be meeting mid-April to continue discussions on Manual requirements.
3. Special presentation suggestions –
   - Suggestions for Future Meetings
     - Delinquent account presentation from Legal – June 2021
     - Research performed by Dr. Montie – mid to late fall 2021.
     - Shell Point presentation – June 2021
     - Cypress Wetlands restoration – June 2021

4. Military installation and other State and Federal properties SWU fees – See "Delinquent Accounts" below. Staff continues to work with GIS to update impervious area layers for the military installations.

5. Delinquent accounts – Phase I Investigations with Gentry Locke Attorneys (looking at data, laws, ordinances, synopsis of case law) to provide recommendations and likely outcomes of either negotiations or litigation.
   - Gentry Locke continues to do research on delinquent fees.

BEAUFORT COUNTY
STORMWATER UTILITY
120 Shanklin Road
Beaufort, South Carolina 29906
Voice (843) 255-2805 Facsimile (843) 255-9436

6. Reminder: Annual Financial report from the Municipalities are due – Per the Intergovernmental Agreements for the Utility, each year on September 30th, the City and Towns are required to submit a summary of revenue and expenditures for the previous fiscal year.
   a) Beaufort County – See attached.
   b) Town of Hilton Head Island – Received.
   c) Town of Bluffton – Received.
   d) Town of Port Royal – Not received.
   e) City of Beaufort – Not received.

Monitoring Update

1. Lab Update (From Dr. Alan Warren and Lab Manager Danielle Mickel)
   i. See attached.
   ii. See attached.

Stormwater Implementation Committee (SWIC) Report

1. SWIC members were sent the Annual Report Memo as well as Management Fee Memo on Wednesday, February 17th. All municipalities have provided concurrence letters for the FY22 budget.

Stormwater Related Projects

1. Easements – Staff is working on easement requests and meets monthly to review status. A few condemnations are still being pursued using outside legal counsel.

2. Complaints – Staff continually works numerous drainage related complaints each month.
   a) Flyover bridge preventative maintenance and deferred maintenance repairs – Recent update: Currently waiting for two quotes for work to be performed, one for construction and one for traffic control.
   b) Shell Point Community – Staff met with consultants on April 6th, with the final study and proposed improvements to be delivered on April 16th to present to potential stakeholders and community members.

3. Factory Creek Watershed Regional Detention Basin "Phase I" & Academy Park Subdivision (Design Cost $49,873, Tree Mitigation Cost $18,200 & $18,200, Construction Cost by the Developer) – As builts delivered, coordinating land acquisition with legal department.

4. Factory Creek Watershed Regional Detention Basin "Phase II" (Design Cost = $63,390, Tree Mitigation Cost is pending, Construction Cost by the Developer) – As builts delivered, staff coordinating to obtain easements with property

owner.

5. Graves Property / Pepper Hall Public / private partnership – Staff continues to work with Davis and Floyd, other departments, and property owner.

6. Whitehall property purchase –No updates at this time.

7. Lady's Island Plan, Sea Level Rise, and "no-fill" ordinance – No updates at this time.

Professional Contracts Report

1. CIP FY 18 Grouping Stormwater Projects – (Design - Ward Edwards $202,000, Andrews Engineering $560,490, Const. est. $5,512,900)
    a) Salt Creek and Shanklin Road – 90% design for both projects. Still waiting for property owner interest.
    b) Salt Creek - Beaufort County MS4 and OCRM received. SCDOT verbally approved project. AEC reached out to property owners to gauge interest in moving forward with property acquisition, no response was received. Project is on hold while County decides on next steps in regards to property acquisition.
    c) Shanklin – USACE submittal underway. MS4, OCRM, and SCDOT submittals will be made as wetland impacts are finalized. AEC reached out to property owners to gauge interest in moving forward with property acquisition, no response was received. Project is on hold while County decides on next steps in regards to property acquisition.
    d) Brewer Memorial – Final permits have been obtained. Staff working on bid documents to begin construction.

2. Evergreen Regional Pond 319 grant project – (Design=$89,286, Construction=$590,000. Grant=$229,124) – OCRM, USACE, SCDOT, and Town of Bluffton permits received. Bidding is completed. Construction begin date to be determined by Beaufort County. Pre construction meeting set for 4/8.

3. Stormwater engineering consulting services – Scope #3, a comprehensive Stormwater department audit, has been executed with Woolpert, with work to begin within the month. Meeting scheduled for 4/8.

Regional Coordination

1. Town of Bluffton and Beaufort County Joint meetings on Sanitary Sewer in the May River watershed – No update at this time.

BEAUFORT COUNTY
STORMWATER UTILITY
120 Shanklin Road
Beaufort, South Carolina 29906
Voice (843) 255-2805 Facsimile (843) 255-9436

2. Mossy Oaks Task Force – County working with USCB and City of Beaufort staff to begin sampling efforts in two areas where drainage improvements are being made.

3. Charleston Area MS4 managers group – No update at this time.

4. May River Watershed Modeling – See municipal reports for more information.

5. Port Royal Sound Conservation Working Group – No additional update at this time.

Municipal Reports

1. Town of Hilton Head Island (From Jeff Netzinger, Stormwater Manager and Brian Eber, MS4 Coordinator)
   i. See Attached.

2. Town of Bluffton (From Kim Jones, Watershed Management Division Director)
   i. See Attached.
3. City of Beaufort (From Nate Farrow, Public Works Director)
   i. No information was available at the time of this report.

4. Town of Port Royal (From Van Willis, Town Manager and Tony Maglione, consultant)
   i. No information was available at the time of this report.

MS4 Report

1. Plan Review – See the attached chart for Beaufort County Stormwater staff plan review workload for the past 12 months.

2. Stormwater Permits – See the attached chart for Beaufort County Stormwater permits issued for the past 12 months.

3. Monthly Inspection summary - See the attached chart for Beaufort County Stormwater staff inspection, complaint, IDDE, and violations summary for the past 12 months.

4. Weather Station Data. See attached report.

5. Public Education – See attached report.

6. Energov permitting software – Staff to continue to test and provide feedback to Energov Implementation team.

BEAUFORT COUNTY
STORMWATER UTILITY
120 Shanklin Road
Beaufort, South Carolina 29906
Voice (843) 255-2805 Facsimile (843) 255-9436

7. MS4 Statewide General permit – No further update at this time.

8. Statewide General permit for Construction – No additional updates at this time.

9. SCDOT – No further update at this time.

Beaufort County Public Works' Stormwater Utility

Stormwater Utility

FY 2020 Actuals

Revenue/Reserve Utilization

March 25, 2021	FY 2019 Actuals	Approved Budget	FY 2020 Unaudited Actuals	Variance
Revenue				
Admin SWU Fees	993,499	1,022,876	1,437,103	414,227
Unincorp/CWI SWU Fees	4,610,468	5,012,244	5,259,463	247,219
Total Revenue from SWU Fees	5,603,968	6,035,120	6,696,566	661,446
Interest	272,185	125,000	181,486	56,486
Gain (Loss) Sale of Capital Assets	75,935	-	4,929	4,929
Other	13,496	-	10,300	10,300
Cost-Share for Joint Efforts	35,823	12,914	18,605	5,691
Reserve Utilization				-
Capital Improvement Fund	-	2,255,544	-	(2,255,544)
	$ 6,001,407	8,428,578	6,911,886	(1,516,692)

$1,162,496 - Unincorp BC
$274,607 - Municipalities

Permits

Regional SW Std Cost-Share
$8,042 - Jasper County
$2,463 - City of Hardeeville
$8,014 - Town of Bluffton

Efforts (Expenditures)

	FY 2019		FY 2020	
Admin	$ 355,975	444,291	$ 305,187	$ (139,104)
Regulation				-
UA/Control Reg	542,250	794,840	506,282	(288,558)
UA/WQ Monitoring	138,259	185,000	120,000	(65,000)
UA/Public Information/Outreach	90,000	95,000	90,000	(5,000)
Utility Activities Subtotal	770,509	1,074,840	716,282	(358,558)
Utility Activities				
UA/Annual Maintenance	2,737,802	4,193,868	3,478,510	(715,358)
UA/Drainage Enhancement	-	20,000	-	(20,000)
UA/Additional Studies	150,532	20,000	25,605	5,605
Utility Activities Subtotal	2,888,334	4,233,868	3,504,115	(729,753)
Reserve Utilization				
Capital Improvement Fund				
Brewer Memorial Demo Pond	55,121	462,000	10,760	(451,240)
Factory Creek Phase I	5,470	-	307	307
Factory Creek Phase II	-	-	-	-
Salt Creek South	58,087	248,496	36,098	(212,398)
Shanklin Road	63,255	341,820	70,356	(271,464)
Evergreen	34,673	317,322	32,726	(284,596)
Camp St. Mary		342,000	-	(342,000)
Mossy Oaks	5,000	205,000	15,404	(189,596)
Shell Point	-	-	43,750	43,750
Reserve Utilization Subtotal	334,628	1,916,638	209,401	(1,707,237)
Capital Improvement Fund				
Surplus (Deficit)	-	-	2,087,732	2,087,732
Utility Operating Fund				
Capital Assets New Purchases	679,340	758,940	89,168	(669,772)
Reserve Fund	250,000	-	-	-
Efforts Total	$ 5,282,586	$ 8,428,578	$ 6,911,886	$ (1,516,692)

$25K - cost-share aerials
$82,630 - Legal services for delinquent fees
$3,899 - depreciation

Professional Services
$72,449 - SW Regional Standards
$2K - MS4 Permit
$10K - Cost-share LIDAR/Aerials
$30,998 - Depreciation

$120K - USCB Lab

$90K - Carolina Clear

$10K - Cost-share LIDAR/Aerials
$188,193 - Interest Expense

Professional Services
$13,080 - Bluffton Flyover
$12,525 - Oak Marsh Plantation

50250011
$34,521 - Pickup truck
$10,352 - Stand-on blower
$21,985 - Trailer (replacement)
$6,595 - Dump trailer
$15,715 - Appraisals, title research, and legal services

USCB Water Quality Lab Update
ACTIVE PROJECTS

Beaufort County

BC Monitoring Plan 2021:

- **Description**: Monitoring plan for 2021 continue from last year to include sampling sites covering all 5 categorical types:

  Category 1: TMDL monitoring
  Category 2: IDDE screening and monitoring
  Category 3: Water quality monitoring (baseline, based upon 303d list)
  Category 4: MOA points
  Category 5: Special project monitoring

- **Status:** First quarter sampling is complete with all sites collected and all requested analyses performed. Second quarter has begun.

Memorandum of Understanding:

- Final version of Memorandum of Understanding for 2021-2026 between Beaufort County and USCB Water Quality Laboratory for continued services has been submitted for approval. The current MOU expires on May 4, 2021.

Pepper Hall Drainage Study:

- **Description:** Pepper Hall property monitoring plan consists of a bi-monthly collection of six sampling sites; 3 inlets and 3 outlets to determine baseline data prior to construction. Sampling will continue during and after construction to measure the effectiveness of BMP's required on-site.

- **Status:** Bi-monthly sampling has begun in January 2021.

Okatie West Pond: Bold and Gold

- **Description:** Environmental Conservation Solutions, LLC, in conjunction with Beaufort County, installed an innovative bacteria and nutrient removing side-bank filter to a section of a newly constructed wet detention pond for the Okatie West Regional Stormwater Project. The purpose of the joint effort is to evaluate the efficiency of the Bold & Gold Side-Bank filter for the possible application in the county to achieve target stormwater treatment in existing and new stormwater BMPs. The pilot project is a 60-foot side bank filter with a 2-foot layer of Bold & Gold® CTS Filtration media as the treatment mechanism, overlaid by a 6-inch well-draining soil that is connected to an underdrain pipe. The filter is located on the south side of the wet detention pond.

- **Status:** Another sampling and analytical effort for Environmental Conservation Solutions, LLC to measure the ability of the Bold and Gold

filtration media to remove bacteria from stormwater detained in the pond known as Okatie West is requested and we are waiting on increases in both water level and bacterial counts. The previous sampling and analytical efforts occurred in March 2020. Efforts were made in November, but bacterial counts were too low to gauge efficiency of filter.

Port Royal Cypress Wetland

- **Description:** The Town of Port Royal wanted to continue with WQ monitoring at the Cypress as the Town is working on a plan to renovate the wetlands to eliminate invasive as much as possible, re-dredge the open water areas and eliminate as many Tallow trees as possible. Having a current base line of WQ information before any work is performed is critical to assessing the "before and after" conditions in Cypress.

- **Status:** Re-dredging is complete and waiting to hear to collect the "after" conditions in September. Cypress wetland project last sampling effort was on September 13th and 18th 2019 for a dry and wet event respectively. Power Point report was included in the February 2020 lab update.

Port Royal Redevelopment:

- **Description:** The Town of Port Royal continues with WQ monitoring for the four sites in the proposed redevelopment area. The sampling schedule is quarterly wet events and is included in Beaufort County's Monitoring Plan.

- **Status:** First quarter is complete, and second quarter has begun.

Town of Bluffton

- **Description:** Monitoring for 2021 continues and includes monitoring for the categories; water quality, 319, MS4, MST, TMDL, and shared locations. A request from Town of Bluffton was made for data analysis of sampling sites dating from 2009 to present.

- **Status**: Monitoring for 2021 continues. USCB is putting together a plan and awaiting data from the Town for the requested data analysis.

USCB Laboratory

Additional Projects:

- Palmetto Bluff: Continued sampling efforts of 12x/year for 6 wet/6 dry events. Sampling sites have been revised to include additional sites to monitor the New River. So far this year, 2 wet/ 2 dry events have been collected along with additional parameters requested by Town of Bluffton at specific sampling sites.

Lab Projects:

- 2021 Proficiency testing for the Water Pollution and Water Supply study is complete. This consisted of 10 different analyses requiring the analysis of an unknown sample, which is then reported to the PT provider and the State. The passing of all analyses in the study is a

requirement to keep laboratory state certification.

- On February 21, 2020, an investigation of an oyster aquaculture operation on St. Helena Island was performed at the request of the owner. The aquaculture pond's water is largely supplied by Wallace Creek, which is frequently closed to shellfish harvesting.

- Dr. Warren supplied USCB's mathematicians/computational science faculty with SCDHEC water quality data at every shellfish station in Areas 14-20. This is similar to what Dr. Warren did a few years ago, and what Dr. Montie did more recently with examining long-term trends and exceedances of fecal coliform based on harvesting standards.

- New equipment arrived to include Rhodamine sensor for various studies, including pond retention times.

COMPLETED PROJECTS

Beaufort County

Crystal Lake:

- **Description:** Crystal Lake bi-monthly sampling and analysis began in August at three locations; boardwalk, nature trail and drainage into lake.

- **Status:** Project ended at the end of September 2020.

Okatie West Pond:

- **Description:** The University of South Carolina Beaufort's Water Quality Lab collected data on a variety of water quality parameters, including fecal coliform and *E. coli* bacteria, prior to and after detention pond construction. Sampling points allowed for the determination of the pond's bacterial removal efficiency, as well as the extent to which pond effluent was reloaded with bacteria as it was conveyed by ditch to the Okatie River's headwaters. Sampling took place in February 2018, prior to pond construction, and again in February 2019 when pond construction was complete.

- **Status:** Project was completed in February 2019.

USCB Laboratory

- **Hilton Head:** GEL Engineering: Discontinued receiving samples for Hilton Head collected by GEL Engineering 4x/ quarter due to using another laboratory .

Received: 3 April 2020 | Accepted: 10 February 2021

DOI: 10.1111/mms.12800

ARTICLE

Marine Mammal Science

Long-term passive acoustics to assess spatial and temporal vocalization patterns of Atlantic common bottlenose dolphins (*Tursiops truncatus*) in the May River estuary, South Carolina

Alyssa D. Marian[1,2†] | Agnieszka Monczak[2,3] | Brian C. Balmer[1,4] | Leslie B. Hart[1,5] | Jamileh Soueidan[2,6] | Eric W. Montie[1,2†]

[1]Graduate Program in Marine Biology, College of Charleston of Charleston, Charleston, South Carolina

[2]Department of Natural Sciences, University of South Carolina Beaufort, Bluffton, South Carolina

[3]Institute of Biological and Environmental Sciences, University of Aberdeen, Aberdeen, UK

[4]National Marine Mammal Foundation, San Diego, California

[5]Department of Health and Human Performance, College of Charleston of Charleston, Charleston, South Carolina

[6]Graduate Program in Environmental and Sustainability Studies, College of Charleston of Charleston, Charleston, South Carolina

Correspondence
Eric W. Montie, One University Boulevard, Bluffton, SC 29909.
Email: emontie@uscb.edu

Funding information
Community Foundation of the Lowcountry; Palmetto Bluff Conservancy; Port Royal Sound Foundation; SC EPSCoR/IDeA Program, Grant/Award Number: #17-RE02; South Carolina Aquarium; South Carolina Sea Grant Consortium and S.C. Space Grant Consortium; Southeast Coastal Ocean Observing Regional Association, Grant/Award Number: NOAA NA16NOS0120028; Spring Island Trust; Town of Bluffton / Beaufort County; USC ASPIRE programs; USC RISE grants; USCB Sea Islands Institute; NOAA Integrated Ocean Observing System (IOOS)

Abstract

Passive acoustics has been used extensively to study bottlenose dolphins; yet very few studies have examined the spatial, temporal, and environmental influences on vocalization types (echolocation, burst pulse sounds, and whistles), and few are long-term and provide high temporal resolution over multiple years. We used data from 2013 to 2018 to establish baseline acoustic patterns for bottlenose dolphins in the May River estuary, South Carolina. We deployed acoustic recorders at six stations during 2013–2014 and three stations during 2015–2018, with locations spanning the entire estuary (headwaters to the mouth). We discovered that acoustic detection of dolphins varied not only spatially, but also yearly, monthly, and tidally. Higher numbers of echolocation bouts, burst pulse sounds, and whistles were detected at the mouth as compared to the headwaters. At the mouth, vocalization detections were greatest in fall and winter for multiple years, and

† These authors contributed equally to this manuscript.

echolocation detection was greatest during falling and low tides. This study provides an example of another tool, long-term passive acoustics monitoring, to better understand spatial and temporal distribution of dolphins in a typical salt marsh estuary, that can be applied to other ecosystems throughout the southeastern United States and globally.

KEYWORDS
bioacoustics, bottlenose dolphin, burst pulse sounds, cetacean, echolocation, marine mammal, *Tursiops truncatus*, vocalizations, whistles

1 | INTRODUCTION

Common bottlenose dolphins (*Tursiops truncatus*, henceforth referred to as bottlenose dolphins) are long-lived, with many individuals within the western Atlantic Ocean having high site fidelity to bays, sounds, and estuaries of the southeastern United States (e.g., Balmer et al., 2013; Hayes et al., 2019; Rosel et al., 2011). Thus, bottlenose dolphins serve as an important sentinel species for the health of marine ecosystems (Bossart, 2011; Wells et al., 2004). As top-level predators feeding on organisms at multiple trophic levels, dolphins are keystone species and play a critical role in responding to and maintaining the structure of an ecological community (e.g., Bossart, 2011; Heithaus et al., 2008; Ritchie & Johnson, 2009). Climate patterns and environmental gradients can impact their distribution, behavior, and foraging ecology. These same factors may also be influenced by anthropogenic activities such as boating, fishing, shoreline development, and dredging (e.g., Bejder et al., 2006; Jensen et al., 2009; Pirotta et al., 2015; Powell & Wells, 2011; Ross et al., 2011; Weilgart, 2007; Wells et al., 2008; Van Ginkel et al., 2017). Long-term monitoring of local dolphin stocks can help identify changes in health and abundance resulting from anthropogenic stressors, prey scarcity, or environmental contaminants (Schwacke et al., 2014; Wells et al., 2004).

In the southeastern United States, there is a complex mosaic of overlapping bay, sound, and estuarine (BSE) and coastal stocks of bottlenose dolphins (Hayes et al., 2019). BSE stocks exhibit localized movements and high site fidelity, while coastal stocks likely have extended movements and lower site fidelity to a given section of coastline (Balmer et al., 2018; Speakman et al., 2010; Zolman, 2002). In South Carolina, there are currently three BSE stocks (the Northern South Carolina Estuarine System Stock, the Charleston Estuarine System Stock, and the Northern Georgia/Southern South Carolina Estuarine System Stock) and two coastal stocks (the South Carolina/Georgia Coastal Stock and the Southern Migratory Coastal Stock) that have some degree of spatial and temporal overlap (Hayes et al., 2019). The Southern Migratory Coastal Stock is hypothesized to migrate along the coast between northern Florida and North Carolina during the spring and fall of each year (Hayes et al., 2019). The South Carolina/Georgia Coastal Stock has been identified to have some seasonal movements into BSE waters during summer (Speakman et al., 2010) and extended movements along the coast throughout the year (Balmer et al., 2018). In addition, some degree of overlap has been identified for adjacent BSE stocks in the South Carolina/Georgia coastal region (Silva et al., 2019).

Previous long-term, photographic-identification studies throughout the southeastern United States have provided some insight into site fidelity and seasonality for both BSE and coastal stocks. Many estuaries along the SC coast are known to have full time residents (e.g., Gubbins, 2002; Sloan, 2006; Speakman et al., 2010; Zolman, 2002). The Calibogue Sound, South Carolina, has been shown to have summer migrants, whereas areas closer to Charleston, South Carolina, have been shown to have fall and winter migrants (Speakman et al., 2010; Zolman, 2002). Methodologies to study distributions and habitat use of these stocks have focused on small vessel surveys and satellite

telemetry, which are beneficial because they provide reliable identification, exact animal counts, and provide a good opportunity for recording surface behavior (Barlow & Taylor, 2005; Simard et al., 2015). However, visual survey methods can be labor intensive, logistically challenging, and lack high temporal resolution (Balmer et al., 2014). While the studies in the southeastern United States have been multi-year studies, visual surveys were mostly conducted monthly which provides only a snapshot of the spatial and temporal patterns within and between these stocks.

Passive acoustics can be utilized as an additional method to provide fine spatial and temporal scale (i.e., 24 hr/day, 7 days/week) approximations of distribution, habitat use, and potential declines of a local population (Marques et al., 2013; Mellinger et al., 2007). Since passive acoustic recorders have high temporal resolution, this approach may be particularly useful in identifying the arrival or departure of migratory, seasonal stocks. This approach allows us to collect long-term, continuous data that is not possible with other techniques. Passive acoustic monitoring can continue at night, regardless of weather and other conditions that inhibit visual observations, can operate year-round at relatively low costs, and is particularly useful in areas where there is low water visibility (Mellinger et al., 2007). Additionally, acoustic recordings can be reanalyzed, which is beneficial for verifying unexpected results or for testing a new analytical method (Simard et al., 2015).

By identifying baseline patterns in acoustic behavior, we can detect and monitor shifts associated with natural variability, changes in climate, or anthropogenic activities. Evidence from previous studies suggest that vocalization patterns can be influenced by vessel presence, stress, underwater noise, group size, prey activity, and season in study areas across the world (e.g., Buckstaff, 2004; Castellote et al., 2015; Esch et al., 2009; Jacobs et al., 1993; Marley et al., 2017; Nuuttila et al., 2017; Quick & Janik, 2008; Tellechea et al., 2014). However, there are virtually no studies examining spatial, temporal, and environmental influences on multiple vocalization types (echolocation, burst pulse sounds, and whistles) for one species, and few are long-term studies that provide extensive temporal coverage over multiple years.

In the present study, we monitored the estuarine soundscape from 2013 to 2018 in the May River estuary, South Carolina, to understand vocalization patterns (the abundances of echolocation, burst pulse sounds, and whistles) of bottlenose dolphins. The May River is a large, tidal river estuary that is characterized as having low volume in the headwaters and increasing volume towards the mouth. This tidal river estuary exhibits similar geographic characteristics to many other estuaries within the southeastern United States (e.g., Dalrymple et al., 1991; Meade, 1969). This geography leads to strong physical and chemical gradients (e.g., depth, salinity, pH, and dissolved oxygen) from the headwaters to the mouth that change seasonally and tidally, which may affect the abundance and distribution of prey and subsequently dolphins (Dalrymple et al., 1991; Ingram & Rogan, 2002). Dolphins within this estuary are considered part of the Northern Georgia/Southern South Carolina Estuarine System (NGSSCES) stock but may have some degree of overlap from the South Carolina-Georgia Coastal stock that inhabits the coastal waters adjacent to this region as is true of those nearby in Calibogue Sound (Gubbins, 2002; Hayes et al., 2019). The geography and stock structure of the May River estuary could serve as a model for understanding the spatial and temporal patterns of dolphin vocalizations in other tidal river estuaries that exhibit similar geographical, physical, and chemical gradients. Our hypotheses were: (1) echolocation would be the most common vocalization in the repertoire of estuarine dolphins; (2) the abundance of echolocation bouts, burst pulse sounds, and whistles would vary spatially with the highest detections near the mouth of the estuary; (3) vocalizations would vary seasonally with more detections in the spring and summer following the arrival of migrants; and (4) vocalizations would vary across multiple temporal scales including tidal, diel, and lunar rhythms.

2 | MATERIALS AND METHODS

2.1 | Study area

The May River is a tidal river estuary (32°12′49″N, 80°52′23″W) that is approximately 22 km in length and the width ranging from 0.01 km near the source to 1 km at the mouth (Figure 1). This estuary opens to the Calibogue Sound,

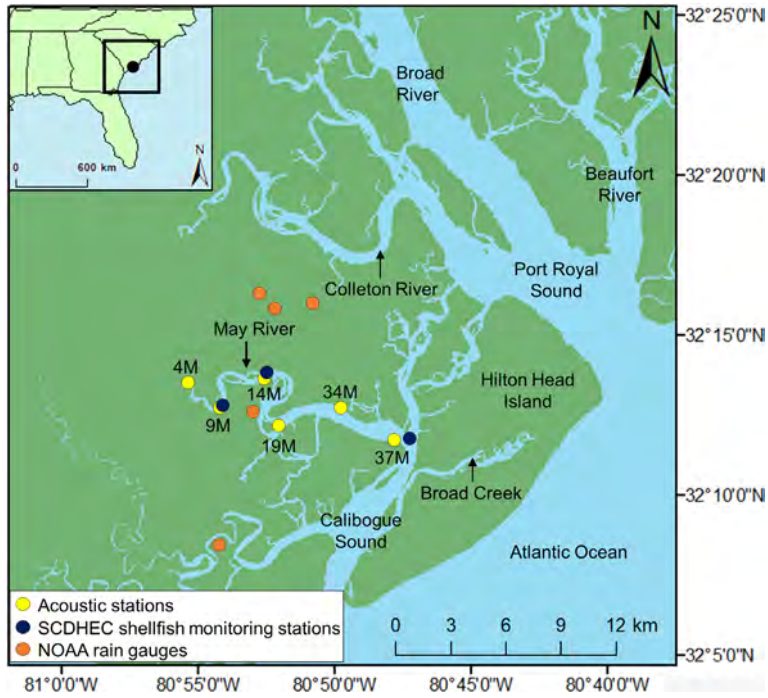


FIGURE 1 Map of the six passive acoustic recording stations in the May River estuary (yellow circles). Stations 4M, 9M, 14M, 19M, 34M, and 37M were used during 2013–2014. Stations 9M, 14M, and 37M were used from 2013 to 2018. Monthly water temperature, salinity, pH, and dissolved oxygen were measured at all six stations from 2016 to 2018. SCDHEC shellfish monitoring stations 19-19B (near 9M), 19–16 (near 14M), and 20–05 (near 37M) (blue circles) and locations of NOAA rain gauges (orange circles) are also included. (Inset) May River estuary (black circle) in reference to the east coast of the United States.

which is semiprotected by Hilton Head Island. Water depth ranges from approximately 3–25 m with shallower depths towards the headwaters. The May River estuary is associated with large areas of salt marsh and oyster reefs and is influenced by a 2.5–3.0 m semidiurnal tidal cycle. Previous research conducted from 2015 to 2017 showed that environmental variables vary spatially from the headwaters to the mouth. Temperature ranges from 19.93°C to 25.42°C, salinity from 7.76‰ to 29.23‰, dissolved oxygen from 2.64 to 11.44 mg/L, and pH from 6.52 to 8.97 (Monczak et al., 2017, 2019, 2020; Montie et al., 2015). Salinity, dissolved oxygen, and pH tend to be lower and more variable in the headwaters as compared to the mouth.

2.2 | Passive acoustic data collection

Data collection followed methodologies previous described (Monczak et al., 2017, 2019). In 2013–2014, we collected passive acoustic data at six locations in the estuary (stations 4M, 9M, 14M, 19M, 34M, and 37M), and in 2015–2018, we collected passive acoustic data at three of the six stations (stations 9M, 14M, and 37M; Figure 1). Station 4M was located closest to the headwaters, followed by stations 9M and 14M. Stations 19M, 14M, and 37M were closest to the mouth with station 37M near the mouth of the river closest to Calibogue Sound. Water depth increases from the headwaters to the mouth with stations 4M, 9M, 14M, 19M, 34M, and 37M having mean depths of 2.77 ± 3.42, 4.76 ± 2.71, 4.94 ± 3.00, 5.28 ± 1.85, 5.70 ± 2.29, and 6.69 ± 2.13 m, respectively (Monczak et al., 2019). All stations are characterized as having a mud bottom with nearby sand bars and intermittent oyster

reefs. Stations were selected based on the abundance of prey activity (calling and chorusing of fish species associated with spawning) and position along the estuary that followed specific environmental gradients (near the headwaters, middle of the estuary, and near the mouth; Monczak et al., 2017). During 2013–2014, recorders were not deployed during winter. Recorders were deployed year-round beginning March 2015 through 2018.

At each station, we deployed DSG-Ocean recorders (Loggerhead Instruments, Sarasota, FL) in custom-built instrument frames (Mooring Systems Inc., Cataumet, MA). Each frame had attachments for depth and temperature loggers (HOBO Water Temperature Pro v2 U22-001 and HOBO 100-Foot Depth Water Level Data Logger U20-001-02-Ti; Onset Computer Corporation, Bourne, MA). Water level was measured every 10 min and temperature was measured every hour. Each recorder had a High Tech hydrophone (sensitivity of −186 dBV μPa^{-1} and gain of 20 dB) and was powered by 24 D-cell alkaline batteries. Depth and temperature loggers were housed in PVC tubes and attached to the frames using zip ties. All frames, recorders, and PVC tubes were painted with antifouling paint. Each frame was equipped with 7 m of galvanized chain attached to a line. Instrument frames with recorders were then deployed on the bottom of the river, approximately 10 m from shore. The line was stretched along the bottom and attached to an auger on the shoreline. We scheduled acoustic recorders to collect sound data with a duty cycle of 2 min every 20 min at a sample rate of 80 kHz. All 2 min recordings were saved on a 128 GB SD card as a DSG file. DSG files were downloaded after each deployment and converted into WAV files. DSG-Ocean recorders were serviced approximately every 3 months. Recorders were tested for functionality before and after every deployment. To complete this task, we played tones at multiple frequencies (100, 200, 400, 800, 1,600, 3,200, 6,400, and 8,000 kHz) and calculated root mean square (rms) sound pressure levels (SPL) for each frequency.

Due to the complexity of sound propagation in water, the true detection range (the maximum distance a vocalizing dolphin can be detected from the recorder location) around each acoustic recorder is currently unknown. This range can be determined using cylindrical spreading models or through empirical measurement via playback experiments (e.g., Jensen et al., 2012; Simard et al., 2015). One study conducted in the West Florida Shelf that used DSG Ocean recorders (with similar hydrophone sensitivity of −186 dBV/μPa) found that the detection range of bottlenose dolphin whistles using a cylindrical spreading model was approximately 200–300 m (Simard et al., 2015). Our recording stations were greater than 3 km apart; therefore, it is unlikely that acoustic signals were recorded at multiple locations.

2.3 | Environmental data collection

From 2015 to 2018, we utilized six water quality stations throughout the river (4M, 9M, 14M, 19M, 34M, and 37M; Figure 1). Temperature, salinity, pH, and dissolved oxygen were measured monthly at all six stations using a YSI 556 Handheld Multiparameter Instrument (YSI Inc./Xylem Inc., Yellow Springs, OH) from 2016 to 2018. This data collection is ongoing; therefore, some 2019 data were presented to further highlight the variability throughout the estuary. We also compiled salinity data from the South Carolina Department of Health and Environmental Control (SCDHEC) Shellfish Monitoring Program for 2013–2018 in which salinity was measured monthly at multiple locations in the estuary. We used data from three SCDHEC locations closest to our acoustic stations (station 19-19B closest to station 9M, station 19–16 closest to station 14M, and station 20–05 closest to station 37M; Figure 1). To supplement these salinity data, we also used rainfall data provided by the National Oceanic and Atmospheric Administration (NOAA) rain gauges that were located within the May River watershed.

2.4 | Acoustic file review

We manually reviewed 2 min WAV files collected on the hour using Adobe Audition CS5.5 software (Adobe Inc., San Jose, CA). Spectrograms were reviewed using a 10 s time window, a spectral resolution of 2,048 set in Adobe

Audition, 50% window overlap, and no filter with frequency ranging from 0 to 40 kHz. In each file, we identified and counted individual bottlenose dolphin whistles, burst pulse sounds, and echolocation bouts by comparing each vocalization to example spectrograms published in previous studies (Herzing, 1996; Tyack, 1986; Figure 2). For our purposes, we only identified echolocation click bouts and did not analyze individual clicks. Echolocation bouts (click trains) were defined by the first and last visible click, each having durations of approximately 50–80 μs (Au, 1997;

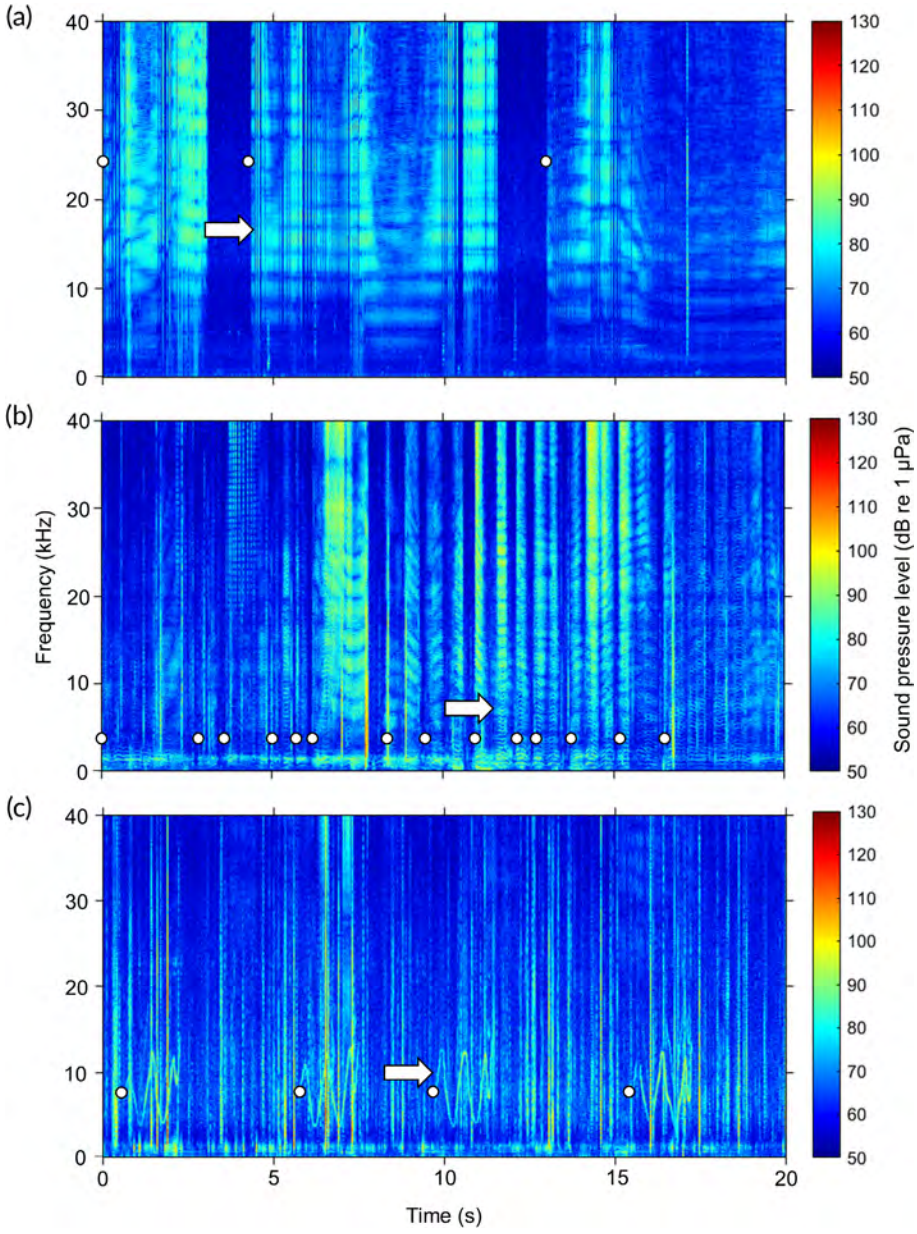


FIGURE 2 Spectrograms highlighting examples of bottlenose dolphin (a) echolocation bouts (b) burst pulse sounds (c) and whistles detected in the May River estuary (white arrows). Each example was recorded using a DSG Ocean recorder during this study. White dots indicate the onset of each vocalization that was counted: (a) three echolocation bouts, (b) fourteen burst pulse sounds, and (c) four whistles.

Hendry, 2004). To be considered a separate echolocation bout, the interbout interval was two times greater than the preceding inter-click interval (Simard et al., 2010). Individual burst pulse sounds were defined by the start and end of clearly defined harmonic bands with high repetition (pulse intervals of 25–175 ms; Au, 1997; Watkins, 1968). Burst pulse sounds were not separated by subtype (e.g., feeding buzzes and squawks). Individual whistles were tonal signals identified by the onset and termination of a single band with a duration >0.1 s that may have one or more frequency modulations (or inflection points; Gridley et al., 2017; Janik & Slater, 1999; Janik et al., 2013). While rare, overlapping whistles were counted only once for consistency. Any vocalizations not clearly defined were not included in our analysis.

2.5 | Data and statistical analysis

We performed statistical analysis using R software version 3.6.1. We used generalized linear models to investigate factors (location, year, month, lunar phase, tidal phase, day/night cycle, and temperature) that influenced acoustic detections for the 2013–2014 (included stations 4M, 9M, 14M, 19M, 34M, and 37M) and 2013–2018 (included stations 9M, 14M, and 37M) data sets. To account for gaps in data due to servicing equipment or equipment failure, we used data from the same date ranges each year in our models. First, we attempted to use a Gaussian general linear model followed by a Poisson generalized linear model, both of which did not fit our data. Our data contained a large number of zeros and were not normally distributed. To account for this over-dispersion, a negative binomial distribution was used for analysis. Lunar phase was categorized as new moon, first quarter, full moon, or last quarter following Eggleston et al. (1998). Tidal phase was categorized as high tide, falling tide, low tide, or rising tide based on depth data collected at each station. Samples with the greatest depth in a tidal cycle were categorized as high tide, while samples with the smallest depth were categorized as low tide. Samples that fell between high and low tide were categorized as falling tide and samples that fell between low and high tide were categorized as rising tide. We used a separate model for each type of dolphin vocalization (echolocation, burst pulse sounds, and whistles). These models were sequential nested models and model selection was based on a forward stepwise selection process and relied upon Akaike information criterion (AIC). For the selected models, we performed a likelihood-ratio chi-square test for each factor to compare the goodness of fit of the model with and without the factor. This approach assisted in understanding the effect size of each factor in our models. Dissolved oxygen, pH, and salinity were not included in our statistical models because they were measured only once a month from 2016 to 2018. Dunnett's post hoc comparisons were conducted for each selected model to understand differences between group means within each factor.

3 | RESULTS

3.1 | Acoustic detections

In the 2013–2014 data set, we reviewed 71,098 acoustic files collected at six stations (Table 1). Bottlenose dolphin vocalizations that we were able to identify included echolocation, burst pulse sounds, and whistles (Figure 2). For this 2-year data set, echolocation occurred in the most WAV files (20,409) as compared to the number of files with burst pulse sounds (3,043) and whistles (759). In addition, the total bouts of echolocation we detected was much higher than the numbers of individual burst pulse sounds and whistles (137,574, 12,482, and 3,840, respectively). For the 2013–2018 data set, we reviewed approximately 96,220 acoustic files from three stations (Tables 1 and 2). Relative numbers of echolocation bouts, burst pulse sounds, and whistles followed a similar pattern with echolocation occurring in the most WAV files (27,324) as compared to burst pulse sounds (4,954) and whistles (2,134). The total

TABLE 1 Bottlenose dolphin acoustic detections at six stations in the May River estuary, South Carolina, from 2013 to 2014.

	File detections				Total vocalizations		
	Total files	Echolocation (%)	Burst pulse sounds (%)	Whistles (%)	Echolocation (%)	Burst pulse sounds (%)	Whistles (%)
2013							
4 M	6,003	35 (0.58)	12 (0.20)	2 (0.03)	203 (75.20)	61 (22.60)	6 (2.22)
9 M	5,988	1,195 (19.97)	339 (5.66)	41 (0.68)	2,257 (77.70)	585 (20.10)	63 (2.17)
14 M	5,985	615 (10.28)	91 (1.52)	60 (1.00)	2,605 (75.00)	572 (16.50)	295 (8.50)
19 M	5,967	3,060 (51.28)	600 (10.05)	112 (1.88)	24,437 (90.10)	2,193 (8.08)	495 (1.82)
34 M	5,965	2,851 (47.80)	260 (4.36)	64 (1.07)	19,564 (94.30)	921 (4.44)	263 (4.27)
37 M	5,965	3,951 (66.24)	468 (7.85)	257 (4.31)	31,611 (88.40)	2,363 (6.61)	1769 (4.95)
2014							
4 M	5,869	15 (0.26)	14 (0.26)	1 (0.02)	84 (51.50)	78 (47.90)	1 (0.61)
9 M	5,868	756 (12.88)	186 (12.88)	7 (0.12)	4,530 (89.30)	510 (10.00)	35 (0.69)
14 M	5,870	223 (3.80)	73 (3.80)	2 (0.03)	940 (79.50)	240 (20.30)	2 (0.17)
19 M	5,875	2,442 (41.57)	428 (41.57)	87 (1.48)	19,451 (89.20)	1,930 (8.85)	429 (7.97)
34 M	5,872	2,828 (48.16)	371 (48.16)	78 (1.33)	20,577 (92.00)	1,543 (6.90)	244 (1.09)
37 M	5,871	2,438 (41.53)	201 (41.53)	48 (0.82)	11,315 (86.80)	1,486 (11.40)	238 (1.83)

Note. File detections = the number of files in which each vocalization type was detected; % = number of detections divided by the number of files analyzed, multiplied by 100%. Total vocalizations = the sum of all detections that were counted in WAV files for each vocalization type; % = the summed detections of each vocalization type divided by the sum of all vocalization types, multiplied by 100%.

number of echolocation bouts detected was higher than the number of burst pulse sounds and whistles (213,430, 25,440, and 15,664, respectively).

3.2 | Models

For the 2013–2014 data set, the best fitting model for echolocation, burst pulse sounds, and whistles included station, year, month, lunar phase, and day/night cycle as factors (Tables 3 and S1). These models also included a month × station interaction and year × station interaction. For the 2013–2018 data set, we found that the best model for echolocation and burst pulse sounds included station, year, month, lunar phase, day/night cycle, and tide as factors with month × station interaction, year × station interaction, and tide × station interaction (Tables 4 and S2). For whistles, the best model included station, year, month, and day/night cycle as factors with a month × station interaction and a year × station interaction.

3.3 | Spatial patterns

Both the 2013–2014 and 2013–2018 data sets were used to investigate spatial patterns in the May River estuary. Relative proportions of each vocalization type varied by location ($p < .001$; Tables 3 and 4). At the headwaters (stations 4M, 9M, and 14M), we detected the lowest number of echolocation bouts and observed the smallest percentage of echolocation (203 detections in 2013 and 84 in 2014; 75% and 51%, respectively; Table 1). Generally, the

TABLE 2 Bottlenose dolphin acoustic detections at three stations in the May River estuary, South Carolina, from 2015 to 2018.

	File detections				Total vocalizations		
	Total files	Echolocation (%)	Burst pulse sounds (%)	Whistles (%)	Echolocation (%)	Burst pulse sounds (%)	Whistles (%)
2015							
9 M	7,063	606 (8.58)	160 (2.27)	102 (1.44)	4,069 (67.00)	790 (13.00)	1210 (19.90)
14 M	7,065	184 (2.60)	18 (0.25)	3 (0.04)	668 (79.40)	42 (4.99)	131 (15.60)
37 M	7,062	2,792 (39.54)	194 (2.75)	198 (2.80)	20,209 (87.40)	1,287 (5.57)	1,618 (7.00)
2016							
9 M	8,758	865 (9.88)	256 (2.92)	62 (0.71)	5,776 (77.90)	985 (13.30)	656 (8.44)
14 M	8,757	322 (3.68)	29 (0.33)	6 (0.07)	1,760 (84.30)	268 (12.80)	61 (2.92)
37 M	8,749	3,237 (37.00)	306 (3.50)	237 (2.71)	24,627 (85.50)	2,039 (7.08)	2,127 (7.39)
2017							
9 M	8,733	1,029 (11.78)	493 (5.65)	89 (1.02)	7,075 (66.10)	2,662 (24.88)	962 (8.99)
14 M	8,734	387 (4.43)	37 (0.42)	9 (0.10)	2,258 (92.30)	102 (4.17)	87 (3.56)
37 M	7,028	3,144 (44.74)	758 (10.79)	313 (4.45)	38,241 (87.00)	3,782 (8.60)	1,939 (4.41)
2018							
9 M	6,866	650 (9.47)	254 (3.70)	44 (0.64)	4,574 (77.20)	938 (15.80)	412 (6.95)
14 M	8,702	451 (5.18)	49 (0.56)	12 (0.14)	2,670 (90.80)	129 (4.86)	143 (4.86)
37 M	8,703	4,479 (51.47)	1,042 (11.97)	644 (7.40)	48,245 (82.00)	6,660 (6.66)	3,916 (6.66)

Note. File detections = the number of files in which each vocalization type was detected; % = number of detections divided by the total number of files analyzed, multiplied by 100%. Total vocalizations = the sum of all detections that were counted in WAV files for each vocalization type; % = the summed detections of each vocalization type divided by the sum of all vocalization types, multiplied by 100%.

number of echolocation bouts detected, and the percentage of total detections increased towards the mouth (Table 1; Figure S1). The opposite was true for burst pulse sounds with larger percentages of total vocalizations detected near the headwaters (stations 4M, 9M, and 14M; Table 1; Figure S1). However, the number of file detections of burst pule sounds were generally higher towards the mouth similarly to echolocation. Interestingly, at station 9M, we generally observed more file detections of echolocation bouts and burst pulse sounds relative to stations 4M and 14M. The number of whistles detected was greatest at station 37M, while the fewest were detected at station 4M (Table 1).

Overall, total vocalizations detected (including echolocation, burst pulse sounds, and whistles) increased from the headwaters to the mouth. For the 2013–2014 data set, stations 4M, 9M, and 14M (closer to the headwaters) had significantly lower detections compared to stations 19M, 34M, and 37M (closer to the mouth of the estuary; Dunnett's post hoc test, $p < .001$; Figures 3 and S2). Similarly, in the 2013–2018 data set, detections were lower at stations 9M and 14M (i.e., closer to the headwaters) as compared to station 37M (at the mouth of the estuary; Dunnett's post hoc test, $p < .001$; Figure 4). Additionally, we observed notable variability in environmental parameters among stations. From 2016 to 2018, we measured the lowest salinity, pH, and dissolved oxygen at the headwaters (station 4M; Figure 5). This station also had the largest overall variability in salinity and dissolved oxygen as compared to stations closer to the mouth (stations 34M and 37M).

TABLE 3 Results of the best generalized linear models that investigated the influence of various factors on bottlenose dolphin vocalizations in the May River estuary, South Carolina in 2013–2014.

Model	Likelihood ratio chi-square	*p*
Echolocation		
Station	18,678.96	**<.001**
Month	2,008.51	**<.001**
Month*Station	1,798.66	**<.001**
Year	1,344.27	**<.001**
Year*Station	1,075.60	**<.001**
Lunar phase	12.55	**.006**
Day/Night	0.32	.574
Burst pulse sounds		
Station	2,013.46	**<.001**
Month	1,221.97	**<.001**
Month*Station	777.21	**<.001**
Year	67.10	**<.001**
Year*Station	65.61	**<.001**
Lunar phase	24.71	**<.001**
Day/Night	14.47	**<.001**
Whistles		
Station	851.10	**<.001**
Month	321.18	**<.001**
Month*Station	223.78	**<.001**
Year	139.28	**<.001**
Year*Station	68.15	**<.001**
Lunar phase	19.39	**<.001**
Day/Night	0.56	.455

Note: Likelihood ratio tests comparing factor effects for 2013–2018. Factors are arranged according to effect size. Bold values indicate significant parameters in the negative binomial model ($p < .05$).

3.4 | Temporal patterns

In the 2013–2018 data set, we observed high levels of variability in acoustic detections over multiple temporal scales. Detections of echolocation, burst pulse sounds, and whistles were significantly influenced by year ($p < .001$; Table 4). For stations 14M and 37M (stations closest to the mouth), we detected the most echolocation in 2013, 2017, and 2018 (Dunnett's post hoc test, $p < .001$; Figure S3). This same pattern was observed for burst pulse sounds and whistles at station 37M (Dunnett's post hoc test, $p < .001$; Figure S3). We investigated whether average yearly salinity and rainfall levels influenced yearly dolphin vocalizations but did not find any clear patterns (Figure S3). In addition to year, acoustic detections were significantly influenced by month ($p < .001$; Table 4). The most prominent acoustic pattern we observed was at station 37M, which had the most echolocation, burst pulse sounds, and whistles during November, followed by December, January, and then February, with detections decreasing in the spring and summer months (Dunnett's post hoc test, $p < .001$; Figure 6). In June and July, we observed the lowest overall detections (Dunnett's post hoc test, $p < .001$).

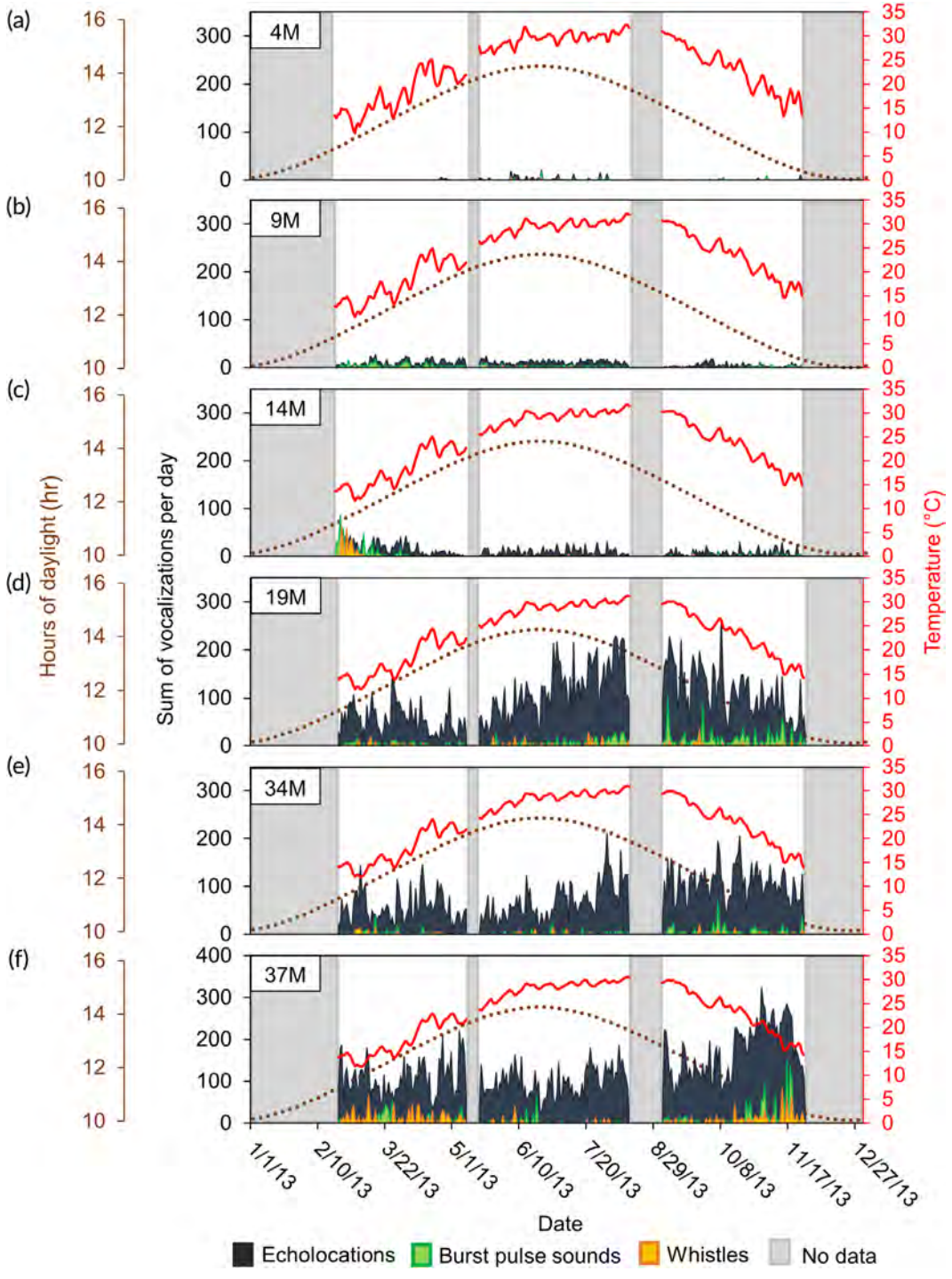


FIGURE 3 Total vocalizations for bottlenose dolphins by station in the May River estuary during 2013 ordered from the headwaters (top) to the mouth (bottom). Sum of vocalizations per day, average daily temperature (red line), and hours of daylight (brown dotted line) for all six stations. Gaps in data (gray boxes) were due to breaks in deployments. Similar patterns were observed during 2014.

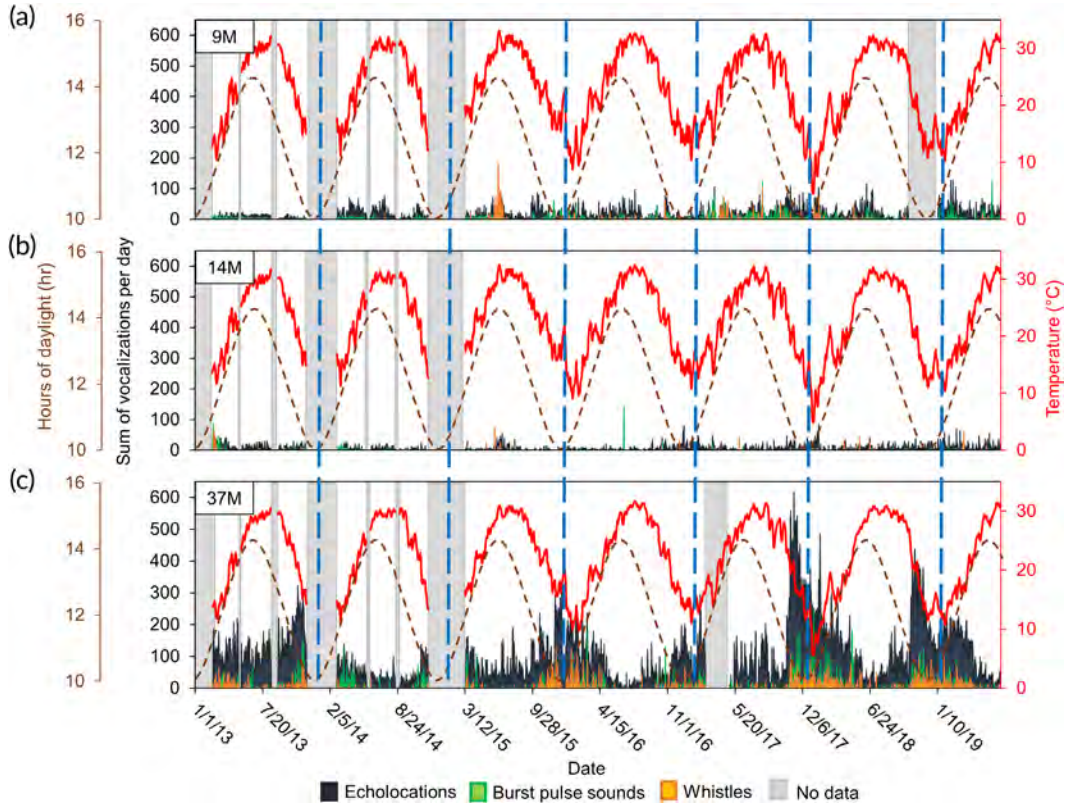


FIGURE 4 Total vocalizations for bottlenose dolphins for three stations in the May River estuary from 2013 to 2018 ordered from the headwaters (top) to the mouth (bottom). While not included in results and statistical analysis, the beginning of 2019 was included here to help illustrate acoustic patterns observed at station 37M during the winter–spring of 2019. Sum of vocalizations per day, average daily temperature (red line), and hours of daylight (brown dotted line) for three stations. Dashed blue lines indicate the end/onset of each year. Gaps in data (gray boxes) were due to breaks in deployments or equipment failure.

Furthermore, we identified distinct patterns for echolocation and burst pulse sounds that followed the day/night, lunar, and tidal cycles. We detected significantly more echolocation and burst pulse sounds during the night, particularly during winter as compared to summer (Dunnett's post hoc test, $p < .001$; Figure 7). Lastly, we observed a very distinct pattern in echolocation at the estuary mouth (station 37M) that followed the tidal cycle. We detected significantly more echolocation during the falling and low tide as compared to the rising and high tide (Dunnett's post hoc test, $p < .001$; Figures 8–10).

4 | DISCUSSION

4.1 | Acoustic repertoire

Bottlenose dolphins produce a variety of detectable vocal signals (e.g., echolocation clicks, burst pulse sounds, and whistles) as a way to respond to and interact with conspecifics and their environment (e.g., Caldwell & Caldwell, 1968; Cook et al., 2004). As expected, in the May River estuary, bottlenose dolphins primarily utilize echolocation, but burst pulse sounds and whistles are also included in their repertoire. Echolocation click trains and

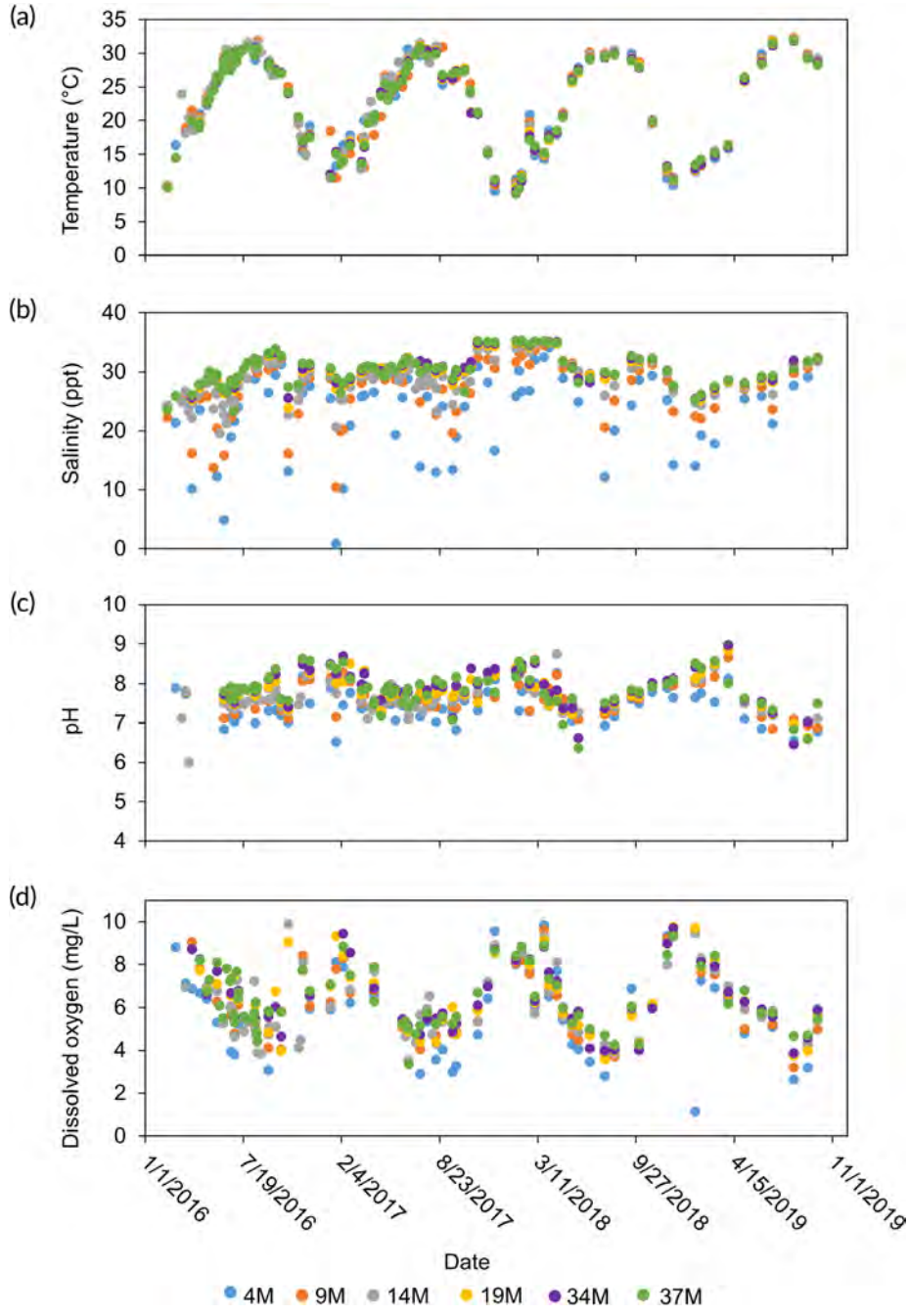


FIGURE 5 Comparisons of environmental parameters observed in the May River estuary from 2016 to 2019 at all six stations. Data from 2019 were included here to further highlight the variability throughout the May River estuary.

buzzes are directional, high frequency vocalizations that are used for navigation and foraging (Herzing, 1996, 2014; Janik, 2000). In the May River estuary, echolocation accounted for approximately 51%–89% of the total vocalizations near the headwaters (i.e., stations 4M, 9M, and 14M) and accounted for approximately 87%–94% near the mouth (i.e., stations 19M, 34M, and 37M.

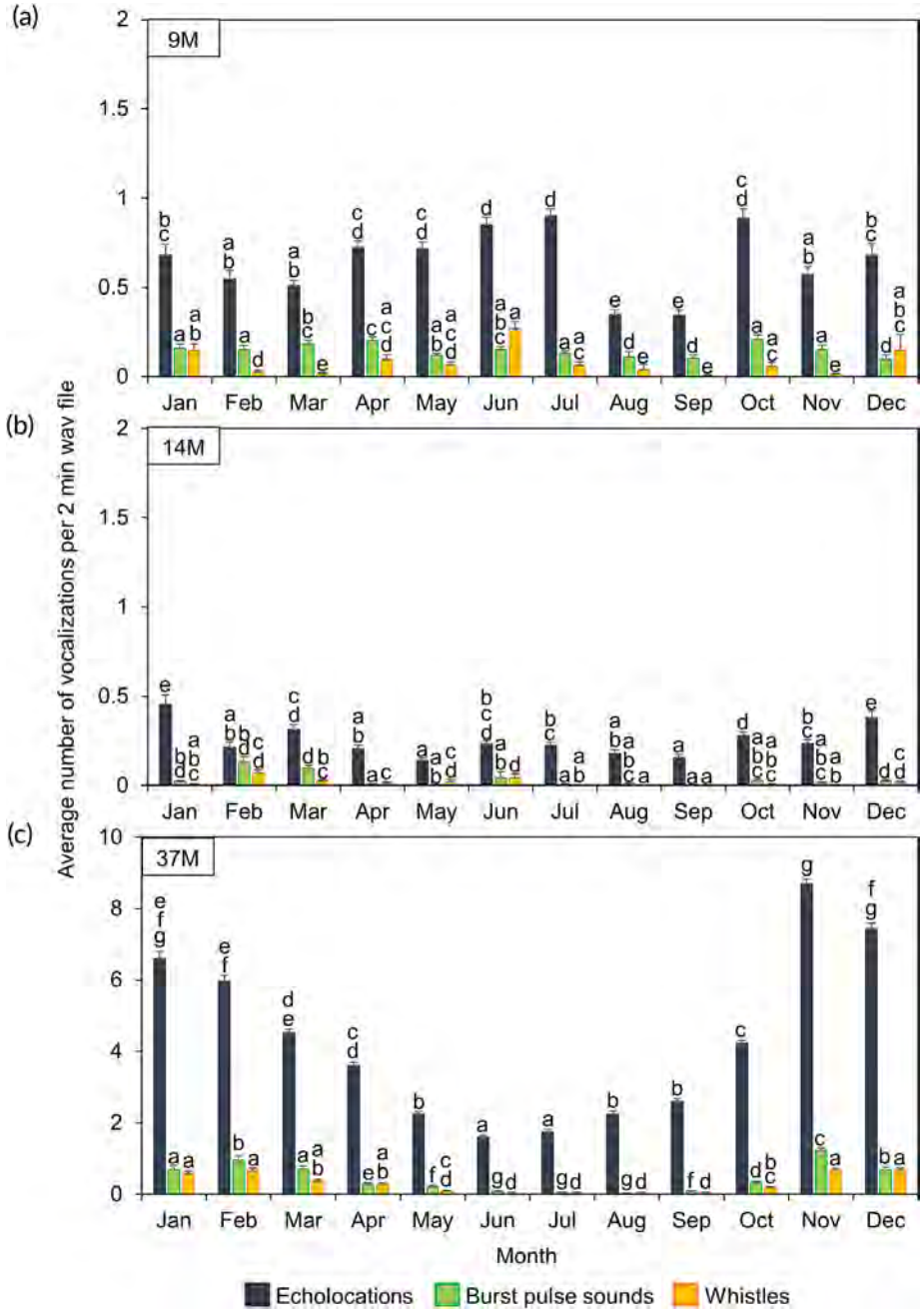


FIGURE 6 Monthly detections for bottlenose dolphin vocalizations at three stations in the May River estuary for 2013–2018 collectively. In order to see patterns at stations 9M and 14M, *y*-axes are not the same as 37M. Error bars indicate the standard error. Lettering above bars are based on Dunnett's post hoc tests. Different letters indicate significant differences in group means ($p < .05$).

Burst pulse sounds are more diverse and complex; these sounds are often referred to as barks, squawks, grunts, and screams that are used in a variety of social behaviors including aggression, discipline, courtship, and sexual activity (e.g., Herzing, 1996, 2014). Because of their complexity, they are the least studied vocalization type but there has

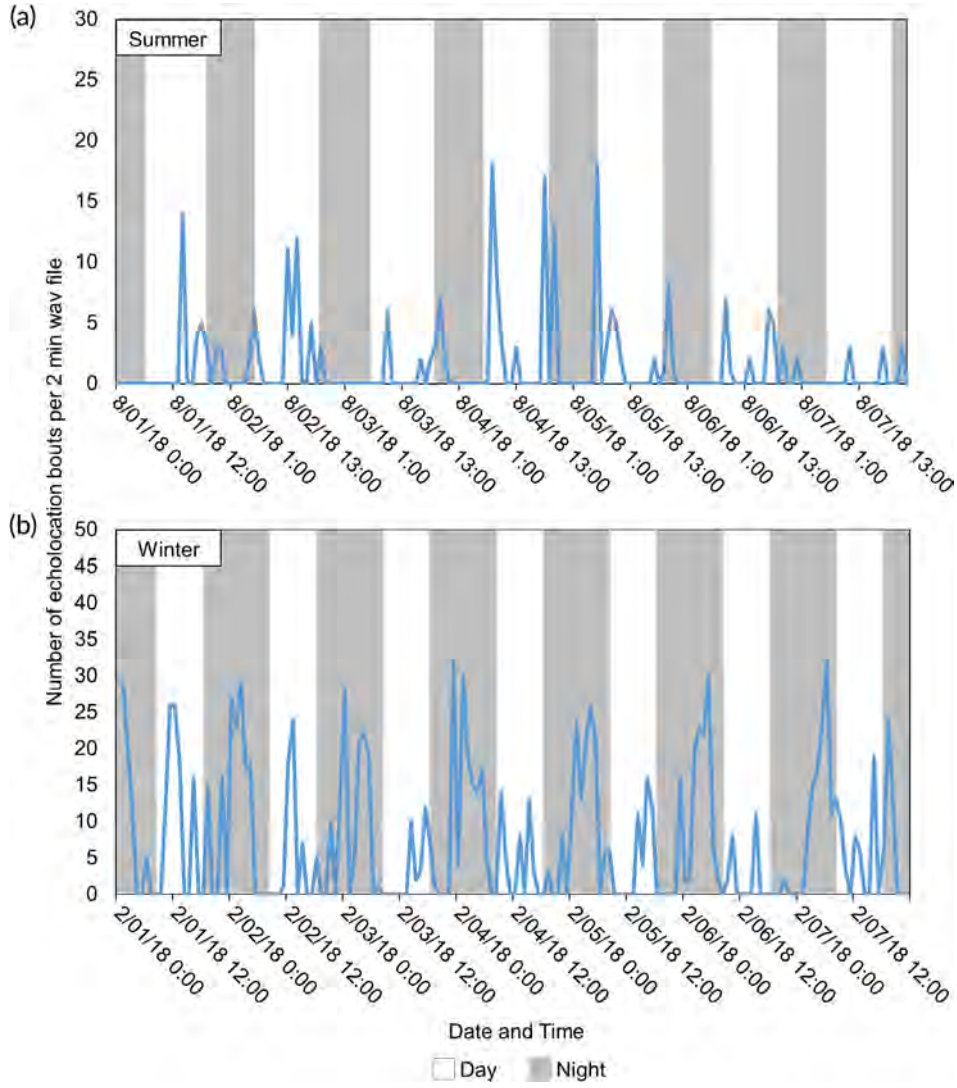


FIGURE 7 Detections of bottlenose dolphin echolocation collected on the hour at station 37M in the May River estuary for (a) one full week in summer and (b) one full week in winter.

been suggestion that burst pulse sounds comprise the majority of bottlenose dolphin vocalizations (e.g., Herman & Tavolga, 1980; Herzing, 2000). However, burst pulse sounds in the May River estuary only accounted for 10%–48% of the total vocalizations near the headwaters and 4%–11% near the mouth. Whistles are frequency and amplitude modulated vocalizations that are used for identification and localization (Caldwell & Caldwell, 1968; Herzing, 2014). In the May River estuary, whistles accounted for approximately 1%–8% of the total vocalizations both near the headwaters and the mouth.

4.2 | Spatial patterns

In the May River estuary, echolocation was most commonly detected at the mouth, which suggests this habitat may be important for foraging. Many studies have found that in coastal areas, habitat selection for foraging is influenced

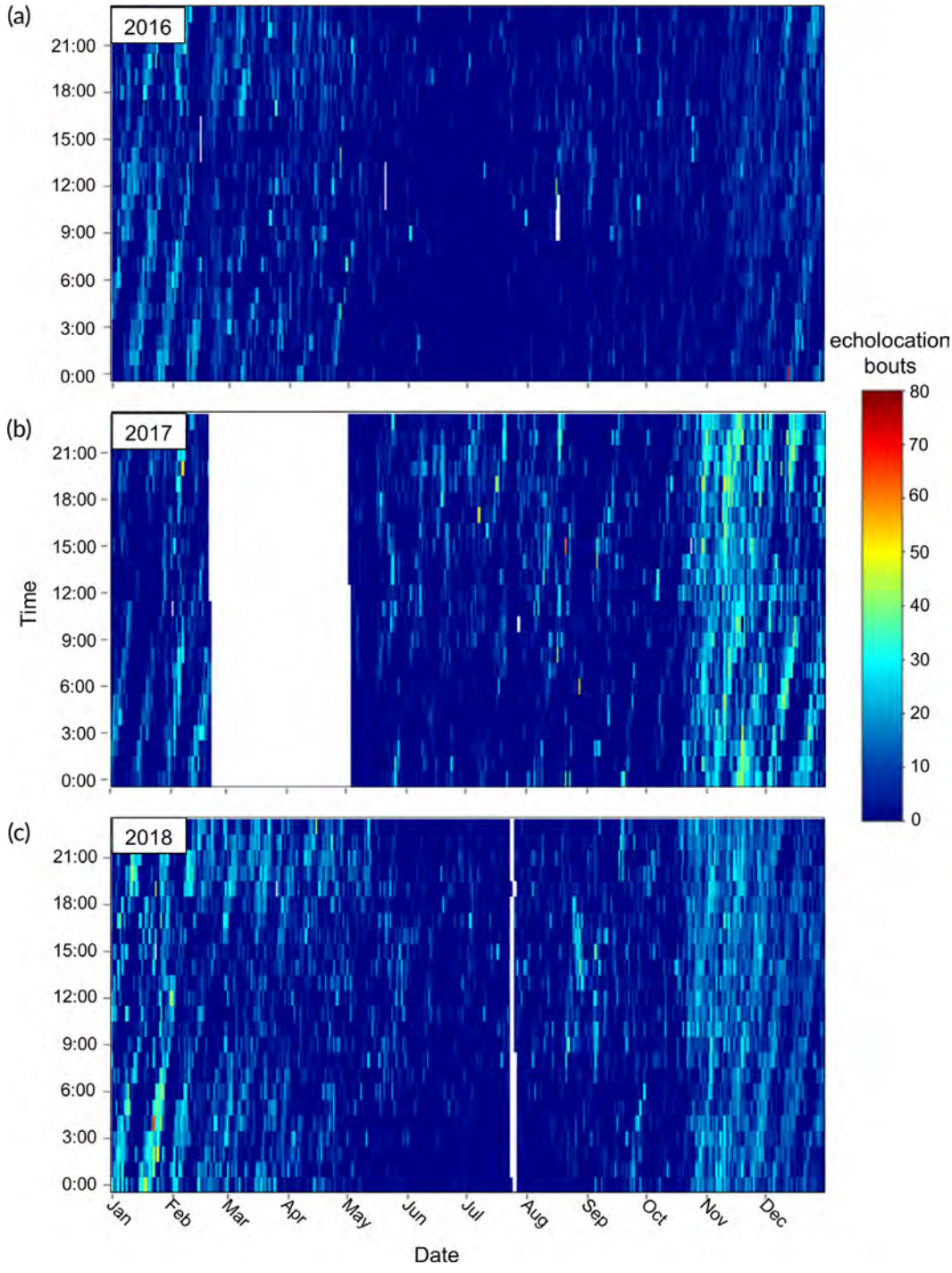


FIGURE 8 Temporal patterns of echolocation of bottlenose dolphins at station 37M in the May River estuary showing daily patterns collected at the mouth of the estuary for 3 years. Time interval indicated on the *y*-axis is between midnight and midnight the following day. The color scale indicates the number of echolocation bouts (warmer colors indicate more echolocation bouts detected). Gaps in data (white areas) are due to breaks in deployments or equipment failure. Stations 9M and 14M did not exhibit these patterns.

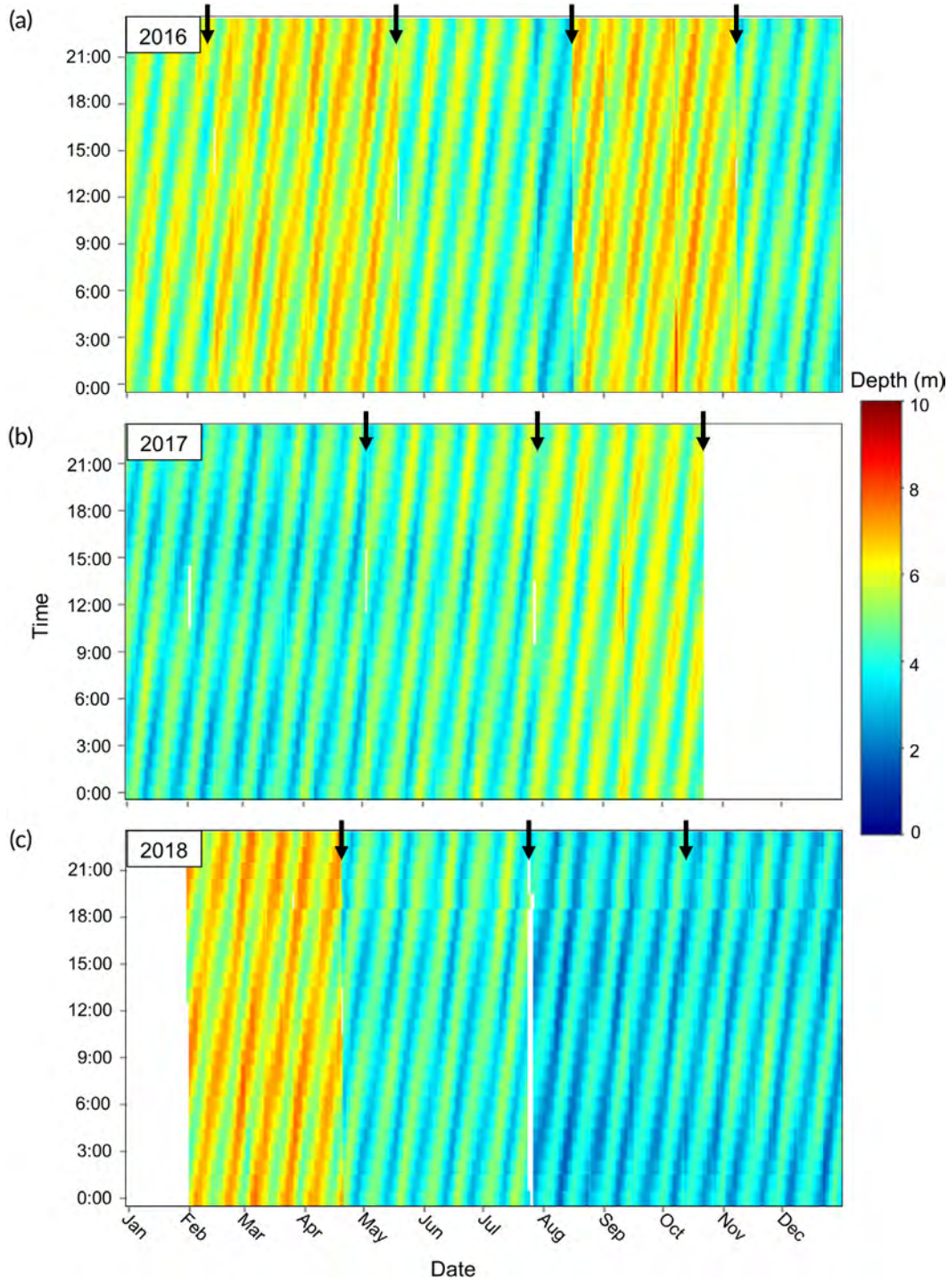


FIGURE 9 Depth data collected at station 37M in the May River estuary for 3 years. Depth loggers collected data every 10 min (HOBO 100-Foot Depth Water Level Data Logger U20-001-02-Ti; Onset Computer Corporation, Bourne, MA). Time interval is between midnight and midnight the following day. The color scale indicates depth (warmer colors indicate greater depths). In addition, warmer colors correspond to rising and high tides while cooler colors correspond to falling and low tides. Gaps in data (white areas) are due to breaks in deployments or equipment failure. Black arrows indicate servicing of recorders and loggers. Depth data from stations 9M and 14M exhibited similar patterns.

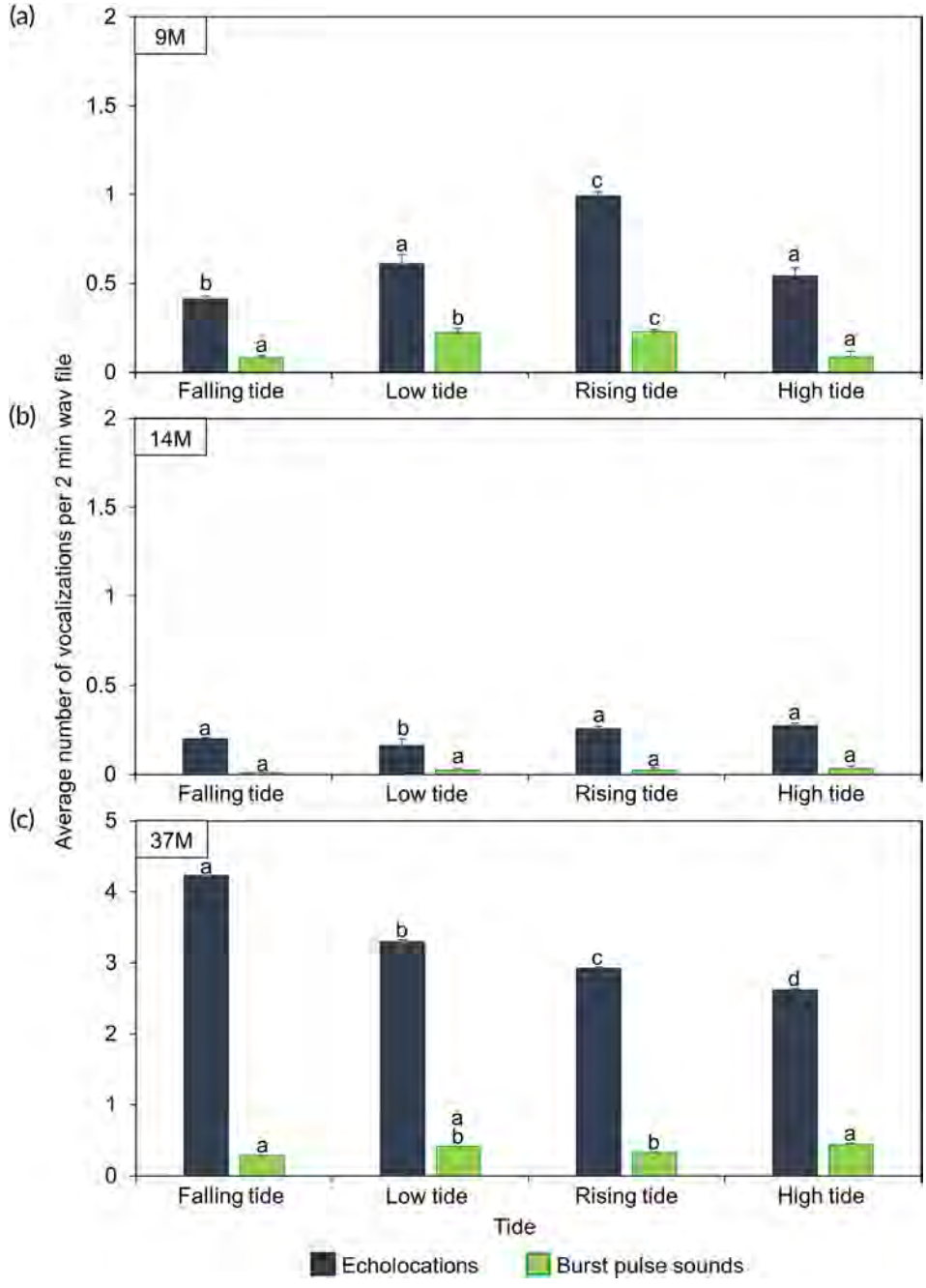


FIGURE 10 Detections of bottlenose dolphin vocalizations in the May River estuary during each phase of the tidal cycle at three stations for 2013–2018 collectively. Whistles were not included because tide was not a significant factor in the statistical model. In order to see patterns at stations 9M and 14M, y-axes are not the same as 37M. Error bars indicate the standard error. Lettering above bars are based on Dunnett's post hoc tests. Different letters indicate significant differences in group means ($p < .05$).

by changing depth and dynamic environmental variables, level of human development, and fish abundance (Allen et al., 2001; Harzen, 1998; Ingram & Rogan, 2002; Miller & Baltz, 2009). Previous research in the May River estuary

detected fewer fish calls in the headwaters as compared to the mouth suggesting that the mouth may be a more favorable spawning location (Monczak et al., 2017; Montie et al., 2015). Bottlenose dolphins do prey on soniferous (sound-producing) fish such as those from the family Sciaenidae (Barros & Wells, 1998; Gannon et al., 2005; McCabe et al., 2010). These fish species, specifically spotted seatrout (*Cynoscion nebulosus*), red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), and silver perch (*Bairdiella chrysoura*), call more frequently at the mouth of the May River, possibly indicating higher abundance and larger spawning aggregations (Monczak et al., 2017; Montie et al., 2015). In Galveston, Texas, the mouth of the Galveston Shipping Channel was a core feeding area for bottlenose dolphins, most likely because it is an area of confluence with a visible tidal front, which may lead to the aggregation of prey (Moreno, 2005). Similarly, the mouth of Tampa Bay is known to have higher densities of dolphins as well as greater acoustic detections (Irvine et al., 1982; Simard et al., 2015). The Gulf of California is also an area in which dolphins have been observed in higher densities at the mouth of estuaries; dolphins use this area primarily for foraging (Ballance, 1992). Perhaps, the mouth of the May River estuary operates similarly and is an important area for feeding.

4.3 | Temporal patterns

Acoustic detections varied across multiple temporal scales with the clearest patterns seen at the mouth of the estuary. On an annual level, we detected more echolocation, burst pulse sounds, and whistles at the mouth during 2013, 2017, and 2018. These yearly patterns did not have any clear relationships with average yearly salinity or rainfall levels. During 2014, 2015, and 2016, it is possible that the overall abundance of dolphins in the estuary decreased or acoustic behavioral patterns changed.

Acoustic detections were also influenced by month with more echolocation, burst pulse sounds, and whistles detected at the mouth during November, January, and December. Preliminary visual survey data indicate that dolphin abundance at the mouth of the May River estuary is the highest in the spring and summer (data not shown). One alternative explanation for seasonal changes in acoustic behavior may be related to prey patterns. Dolphins have been found to select for soniferous fish; therefore, it may be possible that during times when fish are producing more sound (during their courtship and reproductive seasons) dolphins may rely on passive listening to forage (Barros & Wells, 1998; Gannon et al., 2005; McCabe et al., 2010). In the May River estuary, silver perch and black drum call from March to May, spotted seatrout begin calling in May and end in October, and red drum call mostly September to November (Monczak et al., 2017; Montie et al., 2015). The months in which dolphin vocalizations at the mouth were highest (November, December, and January) coincided with the fewest fish calls and choruses (Monczak et al., 2017; Montie et al., 2015). Thus, one hypothesis is that dolphins use passive listening during foraging in spring and summer when more fish are calling, resulting in a lower abundance of echolocation. In the winter, when less fish are calling and prey is scarce, dolphins may need to rely more on echolocation to locate and find food (Gannon et al., 2005; McCabe et al., 2010). This finding can have major implications for passive acoustic monitoring. How you interpret your results when using passive acoustics to monitor the occurrence of dolphins or foraging activity may be affected by times of the year when dolphins are utilizing more passive listening or changing echolocation rates based upon prey availability. Changes in foraging tactics by dolphins is why it may be necessary to count vocalizations other than echolocation, as we have done here. Future research such as fish sampling during different seasons throughout the May River estuary would provide insight into the abundance, distribution, and temporal changes in prey species in relation to echolocation detections.

Another hypothesis that may explain the distinct monthly patterns in acoustic detections near the mouth of the May River estuary is potential seasonal shifts in dolphin movements during the fall and winter from BSE (resident individuals) and overlapping coastal stocks. Movement patterns of these stocks may alter the abundance of dolphins in the May River estuary, particularly at the mouth, which is more accessible to the Atlantic Ocean. As we mentioned previously, we detected more vocalizations at the mouth during late fall and winter (November, December, and January). During this time of year, individuals from the Southern Migratory and/or South Carolina/Georgia Coastal

Stocks may enter the estuary. In addition, there is potential overlap from adjacent BSE stocks in this region. Preliminary visual data in the May River estuary suggests there may be a shift in overall distribution of residents towards the mouth during the fall and winter months; however, the overall abundance of dolphins is lowest in the fall and winter months (data not shown). Further studies integrating visual surveys are warranted and underway.

Movement of prey may explain the tidal patterns of echolocation we observed at the mouth of the estuary. Studies have shown that fish will follow the flooding tide into the marsh in search of shelter or food and then retreat to deeper water on the ebbing tide (Boesch & Turner, 1984; Butner & Brattstrom, 1960; Nixon & Oviatt, 1973; Peterson & Turner, 1994; Shenker & Dean, 1979). Perhaps during the ebb tide, dolphins increase their foraging behavior or shift their distribution from shallower tidal creeks to the main channels of the May River estuary, resulting in increased echolocation detections.

4.4 | Limitations

With passive acoustics come certain limitations, the first of which is decreased reliability of species identification and group size (Marques et al., 2013). In addition, in order for dolphins to be detected, animals need to be producing sound, and acoustic behavior can be influenced by many factors including anthropogenic activity, vessel presence, group size, and perhaps prey availability (Jones & Sayigh, 2002; Simard et al., 2015; Quick & Janik, 2008). Furthermore, we do not know the precise detection range of our acoustic recorders. Sound propagation varies depending on the environment and is affected by bottom type, salinity, temperature, bathymetry, and vegetation (Nowacek et al., 2001). Detection range can be determined using cylindrical spreading models or through empirical measurement via playback experiments (e.g., Jensen et al., 2012; Simard et al., 2015). However, both methods can be complicated and logistically challenging. One study conducted in the West Florida Shelf that used DSG Ocean recorders (with similar hydrophone sensitivity of −186 dBV/μPa) found that the detection range of bottlenose dolphin whistles using a cylindrical spreading model was approximately 200–300 m (Simard et al., 2015). Lastly, there is the physical act of deploying and retrieving equipment (Nuuttila et al., 2017). In our study, there were unavoidable gaps in data collection due to weather and equipment failure. All of these limitations need to be taken into consideration when interpreting these results.

4.5 | Summary

Our study demonstrated the utility of passive acoustics for studying the ecology and distribution of estuarine marine mammals. We used long-term passive acoustic data to monitor dolphins with much higher temporal resolution (sampling 24 hr, 7 days/week, 2 min every hour) than is possible with other methods. We found that higher numbers of echolocation bouts, burst pulse sounds, and whistles occurred at the mouth as compared to the headwaters. At the mouth, vocalizations were greatest in fall and winter for multiple years, and echolocation was greatest during falling and low tides. These results suggest that the mouth is a particularly important area for dolphins, likely for foraging. These data provide important information regarding acoustic behavior below the surface and may help to identify core foraging areas. Long-term monitoring of the acoustic patterns of bottlenose dolphins may be an additional gauge used to measure habitat and estuarine health. This approach allows us to eavesdrop on key behaviors that may change in response to environmental and human-induced changes, thus providing a measure of resilience or shifting baselines in a globally changing environment.

ACKNOWLEDGMENTS

We thank the following individuals for their assistance in collecting and analyzing acoustic data: Bradshaw McKinney, Andrea Parra, Hao Nguyen, Steven Vega, Rebecca Rawson, Travis Kinard, Ashley Freeman, Matt Hoover, Mike

Powell, Chris Kehrer, Andrea Berry, Alishia Zyer, Jenna MacKinnon, Mackenna Neuroth, Hannah Nylander, Michaela Miller, Claire Mueller, Somers Smott, Ashlee Seder, Joshua Himes, Shaneel Bivek, Debra Albanese, Jake Morgenstern, Caleb Shedd, Eva May, Austin Roller, Miane Jackson, Allison Davis, Lincoln Fuller, Corey Chase, Michelle Mixson, Stephanie Keller, and Shane Carey. We also thank Gorka Sancho from the University of Charleston for serving on the thesis committee under which this study was conducted. This work was supported by the Spring Island Trust, Town of Bluffton/Beaufort County, multiple University of South Carolina (USC) ASPIRE internal awards, Community Foundation of the Lowcountry, SC EPSCoR/IDeA Program award (#17-RE02), South Carolina Aquarium, Research Initiative for Summer Engagement (RISE) grant from USC, The LowCountry Institute, USCB Sea Islands Institute, Palmetto Bluff Conservancy, and the Port Royal Sound Foundation. This work was also supported, in part, by the Southeast Coastal Ocean Observing Regional Association (SECOORA) with NOAA financial assistance award number NA16NOS0120028. NOAA Integrated Ocean Observing System (IOOS). The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of SECOORA or NOAA. In addition, A.M. received a Kathryn D. Sullivan Earth and Marine Science Graduate Fellowship to perform this work, which was supported by the South Carolina Sea Grant Consortium and S.C. Space Grant Consortium.

AUTHOR CONTRIBUTIONS

Alyssa Marian: Formal analysis; investigation; methodology; visualization; writing-original draft; writing-review & editing. **Agnieszka Monczak:** Data curation; investigation; methodology; writing-review & editing. **Brian Balmer:** Writing-review & editing. **Leslie Burdett Hart:** Formal analysis; writing-review & editing. **Jamileh Soueidan:** Data curation; methodology; writing-review & editing. **Eric Montie:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing-original draft; writing-review & editing.

ORCID

Eric W. Montie https://orcid.org/0000-0003-4568-4963

REFERENCES

Allen, M. C., Read, A. J., Gaudet, J., & Sayigh, L. S. (2001). Fine-scale habitat selection of foraging bottlenose dolphins *Tursiops truncatus* near Clearwater, Florida. *Marine Ecology Progress Series*, *222*, 253–264. https://doi.org/10.3354/meps222253

Au, W. W. L. (1997). Echolocation in dolphins with a dolphin-bat comparison. *Bioacoustics*, *8*, 137–162. https://doi.org/10.1080/09524622.1997.9753357

Ballance, L. T. (1992). Habitat use patterns and ranges of the bottlenose dolphin in the Gulf of California, Mexico. *Marine Mammal Science*, *8*, 262–274. https://doi.org/10.1111/j.1748-7692.1992.tb00408.x

Balmer, B. C., Schwacke, L. H, Wells, R. S., Adams, J. D., George, R. C., Lane, S. M., McLellan, W. A., Rosel, P. E., Sparks, K., Speakman, T., Zolman, E. S., & Pabst, D. A. (2013). Comparison of abundance and habitat usage for common bottlenose dolphins between sites exposed to differential anthropogenic stressors within the estuaries of southern Georgia, U.S.A. *Marine Mammal Science*, *29*, E114–E145. https://doi.org/10.1111/j.1748-7692.2012.00598.x

Balmer, B. C., Wells, R. S., Schwacke, J. H., Danielson, B., George, R. C., Lane, S. M., McLellan, W. A., Pabst, D. A., Sparks, K., Speakman, T. R., Townsend, F. I., & Zolman, E. S. (2014). Integrating multiple techniques to identify stock boundaries of common bottlenose dolphins (*Tursiops truncatus*). *Aquatic Conservation: Marine and Freshwater Ecosystems*, *24*, 511–521. https://doi.org/10.1002/aqc.2357

Balmer, B., Zolman, E., Rowles, T., Smith, C., Townsend, F., Fauquier, D., George, C., Goldstein, T., Hansen, L., Quigley, B., McFee, W., Morey, J., Rosel, P., Saliki, J., Speakman, T., & Schwacke, L. (2018). Ranging patterns, spatial overlap, and association with dolphin morbillivirus exposure in common bottlenose dolphins (*Tursiops truncatus*) along the Georgia, USA coast. *Ecology and Evolution*, *8*, 12890–12904. https://doi.org/10.1002/ece3.4727

Barlow, J., & Taylor, B. L. (2005). Estimates of sperm whale abundance in the northeastern temperate Pacific from combined acoustic and visual survey. *Marine Mammal Science*, *21*, 429–445. https://doi.org/10.1111/j.1748-7692.2005.tb01242.x

Barros, N. B., & Wells, R. S. (1998). Prey and feeding patterns of resident bottlenose dolphins (*Tursiops truncatus*) in Sarasota bay, Florida. *Journal of Mammalogy*, *79*, 1045–1059. https://doi.org/10.2307/1383114

Bejder, L., Samuels, A., Whitehead, H., Gales, N., Mann, J., Connor, R., Heithaus, M., Watson-Capps, J., Flaherty, C., & Krützen, M. (2006). Decline in relative abundance of bottlenose dolphins exposed to long-term disturbance. *Conservation Biology*, *20*, 1791–1798. https://doi.org/10.1111/j.1523-1739.2006.00540.x

Boesch, D. F., & Turner, R. E. (1984). Dependence of fishery species on salt marshes: The role of food and refuge. *Estuaries*, *7*, 460–468. https://doi.org/10.2307/1351627

Bossart, G. D. (2011). Marine mammals as sentinel species for oceans and human health. *Veterinary Pathology*, *48*, 676–690. https://doi.org/10.1177/0300985810388525

Buckstaff, K. C. (2004). Effects of watercraft noise on the acoustic behavior of bottlenose dolphins, *Tursiops truncatus*, in Sarasota Bay, *Florida*. *Marine Mammal Science*, *20*, 709–725. https://doi.org/10.1111/j.1748-7692.2004.tb01189.x

Butner, A., & Brattstrom, B. H. (1960). Local movement in Menidia and Fundulus. *Copeia*, *1960*, 139–141. https://doi.org/10.2307/1440210

Caldwell, M. C. & Caldwell, D. K. (1968). Vocalization of naive dolphins in small groups. *Science*, *159*, 1121–1123. https://doi.org/10.1126/science.159.3819.1121

Castellote, M., Brotons, J. M., Chicote, C., Gazo, M., & Cerdà, M. (2015). Long-term acoustic monitoring of bottlenose dolphins, *Tursiops truncatus*, in marine protected areas in the Spanish Mediterranean Sea. *Ocean and Coastal Management*, *113*, 54–66. https://doi.org/10.1016/j.ocecoaman.2015.05.017

Cook, M. L., Sayigh, L. S., Blum, J. E., & Wells, R. S. (2004). Signature-whistle production in undisturbed free-ranging bottlenose dolphins (*Tursiops truncatus*). *Proceedings of the Royal Society B: Biological Sciences*, *271*, 1043–1049. https://doi.org/10.1098/rspb.2003.2610

Dalrymple, R. W., Zaitlin, B. A., & Boyd, R. (1991). Estuarine facies models: Conceptual basis and stratigraphic implications. *Journal of Sedimentary Petrology*, *62*, 1130–1146. https://doi.org/10.1306/D4267A69-2B26-11D7-8648000102C1865D

Eggleston, D. B., Lipcius, R. R., Marshall, L. S., Jr., & Ratchford, S. G. (1998). Spatiotemporal variation in post larval recruitment of the Caribbean spiny lobster in the central Bahamas: lunar and seasonal periodicity, spatial coherence, and wind forcing. *Marine Ecology Progress Series*, *174*, 33–49.

Esch, H. C., Sayigh, L. S., Blum, J. E., & Wells, R. S. (2009). Whistles as potential indicators of stress in bottlenose dolphins (*Tursiops truncatus*). *Journal of Mammalogy*, *90*, 638–650. https://doi.org/10.1644/08-MAMM-A-069R.1

Gannon, D. P., Barros, N. B., Nowacek, D. P., Read, A. J., Waples, D. M., & Wells, R. S. (2005). Prey detection by bottlenose dolphins, *Tursiops truncatus*: An experimental test of the passive listening hypothesis. *Animal Behaviour*, *69*, 709–720. https://doi.org/10.1016/j.anbehav.2004.06.020

Gridley, T., Elwen, S. H., Rashley, G., Krakauer, A. B., & Heiler, J. (2017). Bottlenose dolphins change their whistling characteristics in relation to vessel presence, surface behavior and group composition. *Acoustical Society of America*, *27*, 010030. https://doi.org/10.1121/2.0000312

Gubbins, C. (2002). Use of home ranges by resident bottlenose dolphins (*Tursiops truncatus*) in a South Carolina estuary. *Journal of Mammalogy*, *83*, 178–187. https://doi.org/10.1644/1545-1542(2002)083%3C0178:UOHRBR%3E2.0.CO;2

Harzen, S. (1998). Habitat use by the bottlenose dolphin (*Tursiops truncatus*) in the Sado estuary, Portugal. *Aquatic Mammals*, *24*(3), 117–128.

Hayes, S. A., Josephson, E., Maze-Foley, K., Rosel, P. E. (2019). *US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2018*. (NOAA Technical Memorandum NMFS-NE 258). U.S. Department of Commerce. http://www.nefsc.noaa.gov/nefsc/publications/

Heithaus, M. R., Frid, A., Wirsing, A. J., & Worm, B. (2008). Predicting ecological consequences of marine top predator declines. *Trends in Ecology and Evolution*, *23*, 202–210. https://doi.org/10.1016/j.tree.2008.01.003

Hendry, J. L. (2004). *The ontogeny of echolocation in the Atlantic bottlenose dolphin* (Tursiops truncatus). (Doctoral dissertation). University of Southern Mississippi.

Herman, D. L., & Tavolga, W. N. (1980). Communication systems of cetaceans. In L. M. Herman (Ed.), *Cetacean behaviour: Mechanisms and function* (pp. 149–197). Wiley Interscience.

Herzing, D. L. (1996). Vocalizations and associated underwater behavior of free-ranging Atlantic spotted dolphins, *Stenella frontalis* and bottlenose dolphins *Tursiops truncatus*. *Aquatic Mammals*, *22*, 61–79.

Herzing, D. L. (2000). Acoustics and social behavior of wild dolphins: Implications for a sound society. In W. L. Au, R. R. Fay, & A. N. Popper (Eds.), *Hearing by whales and dolphins* (pp. 225–272). Springer.

Herzing, D. L (2014). Clicks, whistles, and pulses: Passive and active signal use in dolphin communication. *Acta Astronautica*, *105*, 534–537. https://doi.org/10.1016/j.actaastro.2014.07.003

Ingram, S. N., & Rogan, E. (2002). Identifying critical areas and habitat preferences of bottlenose dolphins *Tursiops truncatus*. *Marine Ecology Progress Series*, *244*, 247–255. https://doi.org/10.3354/meps244247

Irvine, A. B, Caffin, J. E., & Kochman, H. I. (1982). Aerial surveys for manatees and dolphins in western peninsular Florida. *Fishery Bulletin*, *80*, 621–630.

Jacobs, M., Nowacek, D. P., Gerhart, D. J., Cannon, G., Nowicki, S., & Forward, R. B. (1993). Seasonal changes in vocalizations during behavior of the Atlantic bottlenose dolphin. *Estuaries*, *16*, 241–246. https://doi.org/10.2307/1352496

Janik, V. M. (2000). Source levels and the estimated active space of bottlenose dolphin (*Tursiops truncatus*) whistles in the Moray Firth, Scotland. *Journal of Comparative Physiology A: Sensory, Neural, and Behavioral Physiology*, *186*, 673–680. https://doi.org/10.1007/s003950000120

Janik, V. M., & Slater, P. J. B. (1999). Context-specific use suggests that bottlenose dolphin signature whistles are cohesion calls. *Animal Behavior*, *56*, 829–838. https://doi.org/10.1006/anbe.1998.0881

Janik, V. M., King, S. L., Sayigh, L. S., & Wells, R. S. (2013). Identifying signature whistles from recordings of groups of unrestrained bottlenose dolphins (*Tursiops truncatus*). *Marine Mammal Science*, *29*, 109–122. https://doi.org/10.1111/j.1748-7692.2011.00549.x

Jensen, F. H., Beedholm, K., Wahlberg, M., Bejder, L., & Madsen, P. T. (2012). Estimated communication range and energetic cost of bottlenose dolphin whistles in a tropical habitat. *Journal of the Acoustical Society of America*, *131*, 582–592. https://doi.org/10.1121/1.3662067

Jensen, F. H., Bejder, L., Wahlberg, M., Soto, A., Johnson, M., & Madsen, P. T. (2009). Vessel noise effects on delphinid communication. *Marine Ecology Progress Series*, *395*, 161–175. https://doi.org/10.3354/meps08204

Jones, G. J., & Sayigh, L. S. (2002). Geographic variation in rates of vocal production of free-ranging bottlenose dolphins. *Marine Mammal Science*, *18*, 374–393. https://doi.org/10.1111/j.1748-7692.2002.tb01044.x

Marley, S. A., Salgado Kent, C. P., Erbe, C. & Pamum, I. M. (2017). Effects of vessel traffic and underwater noise on movement, behavior and vocalisations of bottlenose dolphins in an urbanised estuary. *Scientific Reports*, *7*, 13427. https://doi.org/10.1038/s41598-017-13252-z

Marques, T. A., Thomas, L., Martin, S. W., Mellinger, D. K., Ward, J. A., Moretti, J., Harris, D., & Tyack, P. L. (2013). Estimating animal population density using passive acoustics. *Biological Reviews*, *88*, 287–309. https://doi.org/10.1111/brv.12001

McCabe, E. J. B., Gannon, D. P., Barros, N. B., & Wells, R. S. (2010). Prey selection by resident common bottlenose dolphins (*Tursiops truncatus*) in Sarasota Bay, Florida. *Marine Biology*, *157*, 931–942. https://doi.org/10.1007/s00227-009-1371-2

Meade, R. H. (1969). Landward transport of bottom sediment in estuaries of the Atlantic coastal plain. *Journal of Sedimentary Petrology*, *39*, 222–234.

Mellinger, D. K., Stafford, K. M., Moore, S. E., Dziak, R. P., & Matsumoto, H. (2007). An overview of fixed passive acoustic observation methods for cetaceans. *Oceanography*, *20*, 36–45. https://doi.org/10.5670/oceanog.2007.03

Miller, C. E., & Baltz, D. M. (2009). Environmental characterizations of seasonal trends and foraging habitat of bottlenose dolphins (*Tursiops truncatus*) in northern Gulf of Mexico bays. *Fishery Bulletin*, *108*, 79–86. https://doi.org/10.1371/journal.pone.0005661

Monczak, A., Berry, A., Kehrer, C., & Montie, E. W. (2017). Long-term acoustic monitoring of fish calling provides baseline estimates of reproductive timelines in the May River estuary, southeastern USA. *Marine Ecology Progress Series*, *581*, 1–19. https://doi.org/10.3354/meps12322

Monczak, A., McKinney, B., Mueller, C., & Montie, E. W. (2020). What's all that racket! Soundscapes, phenology, and biodiversity in estuaries. *PloS ONE*, *15*(9), e0236874. https://doi.org/10.1371/journal.pone.0236874

Monczak, A., Mueller, C., Miller, M. E., Ji, Y., Borgianini, S. A., & Montie, E. W. (2019). Sound patterns of snapping shrimp, fish, and dolphins in an estuarine soundscape of the southeastern USA. *Marine Ecology Progress Series*, *609*, 49–68. https://doi.org/10.3354/meps12813

Montie, E. W., Vega, S., & Powell, M. (2015). Seasonal and spatial patterns of fish sound production in the May River, South Carolina. *Transactions of the American Fisheries Society*, *144*, 705–716. https://doi.org/10.1080/00028487.2015.1037014

Moreno, M. P. T. (2005). *Environmental predictors of bottlenose dolphin distribution and core feeding densities in Galveston Bay, Texas* (Doctoral dissertation). Texas A&M University.

Nixon, S. W., & Oviatt, C. A. (1973). Ecology of a New England salt marsh. *Ecological Monographs*, *43*, 463–498. https://doi.org/10.2307/1942303

Nowacek, S. M., Wells, R. S., & Solow, A. R. (2001). Short-term effects of boat traffic on bottlenose dolphins, *Tursiops truncatus*, in Sarasota Bay, *Florida. Marine Mammal Science*, *17*, 673–688. https://doi.org/10.1111/j.1748-7692.2001.tb01292.x

Nuuttila, H. K., Courtene-Jones, W., Baulch, S., Simon, M., & Evans, P. G. H. (2017). Don't forget the porpoise: Acoustic monitoring reveals fine scale temporal variation between bottlenose dolphin and harbour porpoise in Cardigan Bay SAC. *Marine Biology*, *164*, 50. https://doi.org/10.1007/s00227-017-3081–35

Peterson, G. W., & Turner, R. E. (1994). The value of salt marsh edge vs interior as a habitat for fish and decapod crustaceans in a Louisiana tidal marsh. *Estuaries*, *17*, 235–262. https://doi.org/10.2307/1352573

Pirotta, E., Merchant, N. D., Thompson, P. M., Barton, T. R., & Lusseau, D. (2015). Quantifying the effect of boat disturbance on bottlenose dolphin foraging activity. *Biological Conservation*, *181*, 82–89. https://doi.org/10.1016/j.biocon.2014.11.003

Powell, J. R., & Wells, R. S. (2011). Recreational fishing depredation and associated behaviors involving common bottlenose dolphins (*Tursiops truncatus*) in Sarasota Bay, Florida. *Marine Mammal Science*, *27*, 111–129. https://doi.org/10.1111/j.1748-7692.2010.00401.x

Quick, N. J., & Janik, V. M. (2008). Whistle rates of wild bottlenose dolphins (*Tursiops truncatus*): Influences of group size and behavior. *Journal of Comparative Psychology*, *122*, 305–311. https://doi.org/10.1037/0735-7036.122.3.305

Ritchie, E. G., & Johnson, C. N. (2009). Predator interactions, mesopredator release and biodiversity conservation. *Ecology Letters*, *12*, 982–998. https://doi.org/10.1111/j.1461-0248.2009.01347.x

Rosel, P. E., Mullin, K. D., Garrison, L., Schwacke, L., Adams, J., Balmer, B., Conn, P., Conroy, M. J., Eguchi, T., Gorgone, A., Hohn, A., Mazzoil, M., Schwartz, C., Sinclair, C., Speakman, T., Urian, K., Vollmer, N., Wade, P., Wells, R., & Zolman, E. (2011). *Photo-identification capture-mark-recapture techniques for estimating abundance of bay, sound, and estuary, populations of bottlenose dolphins along the U.S. east coast and Gulf of Mexico: A workshop report*. (NOAA Technical Memorandum NMFS SEFSC-621). U.S. Department of Commerce.

Ross, P. S., Barlow, J., Jefferson, T. A., Hickie, B. E., Lee, T., MacFarquhar, C., Parsons, E. C., Riehl, K. N., Rose, N. A., Slooten, E., Tsai, C., Wang, J. Y., Wright, A. J., & Yang, S. C. (2011). Ten guiding principles for the delineation of priority habitat for endangered small cetaceans. *Marine Policy*, *35*, 483–488. https://doi.org/10.1016/j.marpol.2010.11.004

Schwacke, L., Smith, C. R., Townsend, F. I., Wells, R. S., Hart, L. B., Balmer, B. C., Collier, T. K., Guise, S. D., Fry, M. M., Guillette, L. J., Lamb, S. V., Jr., Lane, S. M., McFee, W. E., Place, N. J., Tumlin, M. C., Ylitalo, G. M., Zolman, E. S., & Rowles, T. K. (2014). Health of common bottlenose dolphins (*Tursiops truncatus*) in Barataria Bay, Louisiana, following the *Deepwater Horizon* oil spill. *Environmental Science & Technology*, *48*, 93–103. https://doi.org/10.1021/es403610f

Shenker, J. M., & Dean, J. M. (1979). The utilization of an intertidal salt marsh creek by larval and juvenile fishes: Abundance, diversity and temporal variation. *Estuaries*, *2*, 154–163. https://doi.org/10.2307/1351729

Silva, D., Tranutolo, B., DeSalvio, E., Speakman, T., & Young, R. (2019). Abundance and movements of the Northern South Carolina Estuarine System Stock of bottlenose dolphins (*Tursiops truncatus*) (USA). *Journal of Marine Animals and Their Ecology*, *11*, 8–18.

Simard, P., Hibbard, A. L., McCallister, K. A., Frankel, A. S., Zeddies, D. G., Sisson, G. M., Gowans, S., Forys, E. A., & Mann, D. A. (2010). Depth dependent variation of the echolocation pulse rate of bottlenose dolphins (*Tursiops truncatus*). *Journal of the Acoustical Society of America*, *127*, 568–578. https://doi.org/10.1121/1.3257202

Simard, P., Wall, C. C., Allen, J. B., Wells, R. S., Gowans, S., Forys, E. A., Würsig, B., & Mann, D. A. (2015). Dolphin distribution on the west Florida shelf using visual surveys and passive acoustic monitoring. *Aquatic Mammals*, *41*, 167–187. https://doi.org/10.1121/1.3508911

Sloan, P. E. (2006). *Residency patterns, seasonality and habitat use among bottlenose dolphins*, Tursiops truncatus, *in the Cape Romain National Wildlife Refuge, SC* (Master's thesis). University of North Carolina Wilmington.

Speakman, T. R., Lane, S. M., Schwacke, L. H., Fair, P. A., & Zolman, E. S. (2010). Mark-recapture estimate of seasonal abundance and survivorship for bottlenose dolphins (*Tursiops truncatus*) near Charleston, South Carolina, USA. *Journal of Cetacean Research and Management*, *11*, 153–162.

Tellechea, J. S., Bouvier, D., Cambon-Tait, D., & Norbis, W. (2014). Passive acoustic monitoring of bottlenose dolphins (*Tursiops truncatus*) on the Uruguayan coast: Vocal characteristics and seasonal cycles. *Aquatic Mammals*, *40*, 173–184. https://doi.org/10.1578/AM.40.2.2014.173

Tyack, P. L. (1986). Whistle repertoires of two bottlenose dolphins, *Tursiops truncatus*: Mimicry of signature whistles? *Behavioral Ecology and Sociobiology*, *18*, 251–257. https://doi.org/10.1007/BF00300001

Van Ginkel, C., Becker, D. M., Gowans, S., & Simard, P. (2017). Whistling in a noisy ocean: Bottlenose dolphins adjust whistle frequencies in response to real-time ambient noise levels. *Bioacoustics*, *27*(4), 391–405. https://doi.org/10.1080/09524622.2017.1359670.

Watkins, W. A. (1968). The harmonic interval: Fact or artifact in spectral analysis of pulse trains. In W. N. Tavolga (Ed.), *Marine bioacoustics* (pp. 15–43). Pergamon Press. https://doi.org/10.1575/1912/2726

Weilgart, L. S. (2007). The impacts of anthropogenic ocean noise on cetaceans and implications for management. *Canadian Journal of Zoology*, *85*, 1091–1116. https://doi.org/10.1139/Z07-101

Wells, R. S., Allen, J. B., Hofmann, S., Bassos-Hull, K., Fauquier, D. A., Barros, N. B., DeLynn, R. E., Sutton, G., Socha, V., & Scott, M. D. (2008). Consequences of injuries on survival and reproduction of common bottlenose dolphins (*Tursiops truncatus*) along the west coast of Florida. *Marine Mammal Science*, *24*, 774–794. https://doi.org/10.1111/j.1748-7692.2008.00212.x

Wells, R. S., Rhinehart, H. L., Hansen, L. J., Sweeney, J. C., Townsend, F. I., Stone, R., Casper, D. R., Scott, M. D., Hohn, A. A., & Rowles, T. K. (2004). Bottlenose dolphins as marine ecosystem sentinels: Developing a health monitoring system. *EcoHealth*, *1*, 246–254. https://doi.org/10.1007/s10393-004-0094-6

Zolman, E. S. (2002). Residence patterns of bottlenose dolphins (*Tursiops truncatus*) in the Stono River estuary, Charleston County, South Carolina, U.S.A. *Marine Mammal Science*, *18*, 879–892. https://doi.org/10.1111/j.1748-7692.2002.tb01079.x

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Marian AD, Monczak A, Balmer BC, Hart LB, Soueidan J, Montie EW. Long-term passive acoustics to assess spatial and temporal vocalization patterns of Atlantic common bottlenose dolphins (*Tursiops truncatus*) in the May River estuary, South Carolina. *Mar Mam Sci*. 2021;1–25. https://doi.org/10.1111/mms.12800

April 2021 Municipal Report - Town of Hilton Head Island
Prepared for the Stormwater Utility Board
Reporting Period Ending on March 31, 2021

1. MS4 Update (EBER/SCHUMACHER)

MCM1 Public Education & Outreach	• Healthy Pond Series: Aquatic Plants 3-04-2021 • Keeping ponds healthy 3-31-21 • Being a neighbor for clean water webinar 4-6-21
MCM2 Public Involvement & Participation	• Adopt a Salt-water Watershed Train the Trainer started certification process with DHEC. This will involve training volunteers who want to test surface water for water quality parameters. 3-30-2021
MCM3 Illicit Discharge Detection & Elimination	18 H2O quality monitoring sites tested & analyzed 1 Complaints received 1 Investigated with SCDHEC 0 Resolved
MCM4 Construction Site SW Runoff Control	10 Plan reviews w/ corrections required 67 Plan reviews approved 11 Utility Permits 32 Active permitted construction sites 130 Inspections completed; Failed-0, P.Pass-16 10 Pre-Clear Inspection by Eber 6 C of C Inspections by Eber 0 Pre-Clear Inspections done by Schumacher 0 NOV issued
MCM5 Post-Construction SW Management	• 3 PCBMP inspections this month. • 5 PCBMP Completed for February • 27 PCBMP inspection by July 1 • Employed Cartegraph for PCBMP inspections.
MCM6 Pollution Prevention/Good Housekeeping	• Presentations to Town staff given via virtual Meetings, including a quiz. • Community Development completed 7/3 & 8/7 • Facilities Completed in September 2020

2. Service Requests (MARTIN)

A. March 2021 Service Request Activity:

- New requests: 10 80 (FY21 to date)
- Requests closed: 4 86 (FY21 to date)

B. Open Requests as of March 31, 2021:

- Open Qualifying: 285
  - Public (92)
  - Private* (193)
- Open Enforcement 10
  - IDDE (3)
  - Other (7)
- Open Referrals 42
  - County (18)
  - SCDOT (24)

** Located in residential POAs with current maintenance agreements*

C. Service Request Totals as of March 31, 2021:

- Open: 306 change in last 30 days: +4
- Closed: 1113 change in last 30 days: +7
- Total: 1419 change in last 30 days: +11

3. Major Capital Improvements Update (LADD)

A. Lawton (Sea Pines) SW Pump Station – Electrical System Rehabilitation

Reconstruction of the pump station facility is underway.

- Contract
  - Prime: BRW Construction (utilizing current on-call services contract)
  - Total construction cost: $1.6 million.
  - NTP on October 9, 2020
  - Estimated completion date: May 28, 2021 (8 Months).
- Permitting
  - Sea Pines ARB approved (9/2/20)
  - Town Minor DRP approved (9/30/20)
  - Town Demolition Permit approved (12/1/20)
  - Town Building Permit approved (01/13/21)
- Construction Status Update
  - Erosion and sediment control measures installed (11/16/20)
  - Pre-Clear Inspection passed (11/19/20)
  - Demolition completed (12/15/20)
  - Utility relocations completed (1/29/2021)
  - Building construction underway (1/29/21)
  - Safety disconnect platform construction underway (3/29/21)

4. Pump Station and Routine Maintenance Projects (LADD)

Refer to attached Routine Maintenance Schedule, Revised 4/1/2021

5. CIP and Maintenance Projects (UYESUGI)

Refer to attached SWU FY21 Projects Schedule, Revised 4/1/2021

6. Inventory & Modeling Program (NETZINGER)

A. Lower Jarvis Creek Study (FY19 Budgeted Watershed)

The Town is utilizing Woolpert to conduct a study of the Lower Jarvis Creek Watershed. The study involves collecting data for the existing stormwater system in the field, and identifying infrastructure deficiencies and flood hazards. The study area includes portions of William Hilton Parkway, Wild Horse Road, Gum Tree Road, Spanish Wells Road and Jonesville Road and within portions of the Indigo Run Community. The project is scheduled to be complete by September 2020. *Status meeting held on October 14.* ***Woolpert submitted final report in February. Project is complete.***

B. South Forest Beach/Lawton Creek Study (FY20 Budgeted Watershed)

The Town will utilize an on-call consultant to study this watershed once we have the on-call contracts in place. ***We anticipate work beginning on this project in May of 2021.***

C. North Forest Beach/Shipyard/Wexford Study (FY21 Budgeted Watershed)

The Town will utilize an on-call consultant to study this watershed once we have the on-call contracts in place. ***We anticipate work beginning on this project in May of 2021***.

TOWN OF HILTON HEAD ISLAND
SWU ROUTINE MAINTENANCE

ROUTINE MAINTENANCE SCHEDULE

UPDATED: April 1, 2021

MUNIS PROJECT CODE	NO.	WARD	SYSTEM	PROJECT LOCATION / LIMITS	SERVICE CONTRACT	ANNUAL BUDGET	ACTUAL (YTD)	ANNUAL SERVICE FREQUENCY	FY 2021													
									2020						2021							
									JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN		
XR001	1	1	AIRPORT OUTFALL CHANNEL	HHI AIRPORT TO DILLON RD	C11-2020 AQL	$ 1,468	$ -	1											X			
XR002	2	1	PALMETTO HEADLANDS	BEACH CITY RD TO HHI AIRPORT & CARDINAL RD & HUNTER RD	C11-2020 AQL	$ 16,420	$ 7,088	2	X										X			
XR003	3	1	SUMMIT / GATEWAY	ROADSIDE DITCHES, DILLON ROAD TO CUL-DE-SAC	C11-2020 AQL	$ -	$ -	TBD														
XR004	4	1	TABBY WALK	TABBY WALK APARTMENTS FROM MATHEWS DR TO NORTHRIDGE WETLAND	C11-2020 AQL	$ -	$ -	TBD														
XR005	5	1	NORTHRIDGE TRACT	CULVERTS AT PALMETTO PKY & US 278 BUSINESS	C10-2020 HHL	$ 849	$ -	1											X			
XR006	6	1	MID-ISLAND TRACT	US 278 BUSINESS TO UNION CEMETERY RD & UNION CEMETERY RD TO MARKET PLACE DR	C11-2020 AQL	$ 3,410	$ -	1				X										
XR007	7	1	MATHEWS SIDE STREETS	DRAINAGE AREA AT END OF POWER ALLEY	C11-2020 AQL	$ 1,379	$ -	1											X			
XR008	8	6	ISLANDERS BEACH PARK / SPARKLEBERRY DITCH	ISLANDER'S BEACH PARK	C11-2020 AQL	$ 1,754	$ 836	2		X										X		
XR009	9	6	FOLLY FIELD POA	STARFISH DR TO ISLAND CLUB SUBDIVISION	C11-2020 AQL	$ 2,104	$ -	1												X		
XR010	10	6	FOLLY FIELD BEACH PARK	FOLLY FIELD BEACH PARKING LOT & ENTRANCE	C11-2020 AQL	$ 705	$ -	1											X			
XR011	11	4	OTTER CREEK CHANNEL	US 278 BUSINESS TO LEG O'MUTTON RD	C10-2020 HHL	$ 24,250	$ 11,595	2		X										X		
XR012	12	1	OAKS/SEA TURTLE CHANNEL	SOUTHWOOD PARK DR TO INDIAN TR	C11-2020 AQL	$ 2,581	$ -	1										X				
XR013	13	1	OLD WOODLANDS CHANNEL	ACCESS OFF END OF INDIAN TR	C11-2020 AQL	$ 3,175	$ 1,425	2				X								X		
XR014	14	1	ASHMORE CHANNEL	US 278 BUSINESS TO MATHEWS DR	C11-2020 AQL	$ 2,061	$ -	1					X									
XR015	15	1	MATHEWS CHANNEL	ISLAND DR TO BROAD CREEK @ ASHMORE OUTFALL	C11-2020 AQL	$ 860	$ -	1											X			
XR016	16	1	MARSHLAND OUTFALL	15 MARSHLAND RD TO BROAD CREEK	C11-2020 AQL	$ 988	$ -	1											X			
XR017	17	4	VICTORIA SQUARE OUTFALL	VICTORIA SQUARE TO BROAD CREEK	C11-2020 AQL	$ 1,108	$ -	1											X			
XR018	18	1 & 4	NORTH MAIN STREET	WHOOPING CRANE TO HOSPITAL CENTER BLVD	C11-2020 AQL	$ -	$ -	TBD														
XR019	19	1	BERMUDA POINTE OUTFALL	SQUIRE POPE RD TO SKULL CREEK	C11-2020 AQL	$ 922	$ -	1												X		
XR020	20	1 & 2	GUMTREE CHANNEL	SQUIRES GATE RD TO WILD HORSE RD	C11-2020 AQL	$ 3,941	$ -	1												X		
XR021	21	1	CLIFFORD MILLER CHANNEL	GUMTREE RD TO POND AT FIRST TEE GOLF COURSE	C10-2020 HHL	$ 935	$ -	1												X		
XR022	22	1	CAROLINA ISLES SYSTEM	WEIR & OUTFALL, GUMTREE RD TO MARSHSIDE DR	C10-2020 HHL	$ 740	$ -	1												X		
XR023	23	1	WILBORN OUTFALL	MAIN ST TO JARVIS CREEK CHANNEL	C11-2020 AQL	$ -	$ -	TBD														
XR024	24	6	JARVIS CREEK CHANNEL NORTH	HILTON HEAD PLANTATION TO US 278 BUSINESS	C11-2020 AQL	$ 1,269	$ -	1												X		
XR025	25	4	JARVIS CREEK CHANNEL SOUTH	NATURES WAY TO CROSS ISLAND PKY	C11-2020 AQL	$ 3,848	$ -	1												X		
XR026	26	4	JARVIS CREEK PUMP STATION	US 278 BUSINESS TO NATURES WAY	C11-2020 AQL	$ 1,280	$ 640	2		X										X		
XR027	27	4	JARVIS CREEK PARK OUTFALL	LAKE AT JARVIS CREEK PARK	C10-2020 HHL	$ 2,024	$ -	1												X		
XR028	28	1	OAKVIEW CHANNEL	SPANISH WELLS RD TO OAKVIEW RD	C10-2020 HHL	$ 2,630	$ 1,670	2						X						X		
XR029	29	1 & 3	SAM FRAZIER CHANNEL	OAKVIEW RD TO JARVIS CREEK	C10-2020 HHL	$ 3,410	$ 2,570	2						X						X		
XR030	30	1	MUDDY CREEK CHANNEL NORTH	BRYANT RD TO MUDDY CREEK RD	C10-2020 HHL	$ 3,047	$ 2,275	2						X						X		
XR031	31	1 & 3	MUDDY CREEK CHANNEL SOUTH	54 MUDDY CREEK RD TO CROSS ISLAND PKY	C10-2020 HHL	$ -	$ -	TBD														
XR032	32	4	DIANAH DRIVE CHANNEL	2 DIANAH'S DRIVE & MARSHLAND ROAD	C10-2020 HHL	$ 1,820	$ 19,221	2	X											X		
XR033	33	1	BLAZING STAR LANE	POND AT END OF BLAZING STAR LANE	C11-2020 AQL	$ -	$ -	TBD														
XR034	34	1	ALEX PATTERSON ROAD	MARSHLAND ROAD TO CUL-DE-SAC	C11-2020 AQL	$ -	$ -	TBD														
XR035	35	3	YACHT COVE OUTFALL	YACHT COVE POA TO BROAD CREEK	C11-2020 AQL	$ 772	$ -	1												X		
XR036	36	3	WEXFORD PUMP STATION	54 YORKSHIRE DR (WEXFORD PLANTATION)	C11-2020 AQL	$ 1,386	$ 693	2				X								X		
XR037	37	3	HAIG POINT CHANNEL	PALMETTO BUSINESS PARK TO BROAD CREEK	C11-2020 AQL	$ 2,174	$ -	1												X		
XR038	38	3	ARROW ROAD CHANNEL	BIKE PATH FROM ARROW RD TO CROSSINGS PARK	C11-2020 AQL	$ 8,630	$ -	1												X		
XR039	39	3	WEXFORD CHANNEL	US 278 BUSINESS TO DUNNAGAN'S ALLEY	C11-2020 AQL	$ 1,110	$ -	1												X		
XR040	40	3	SHIPYARD PUMP STATION	CORDILLO DR (SHIPYARD PLANTATION)	C10-2020 HHL	$ 1,252	$ 626	2	X											X		
XR041	41	4	IBIS CHANNEL	HERON STREET & NORTH FOREST BEACH DRIVE	C11-2020 AQL	$ 1,084	$ 2,643	1									X					
XR042	42	5	FIRST BAPTIST CHANNEL	SOUTH FOREST BEACH DR TO CORDILLO PKWY	C11-2020 AQL	$ 2,643	$ -	1									X					
XR043	43	5	LAWTON CANAL PUMP STATION	GREENWOOD DR (SEA PINES PLANTATION)	C10-2020 HHL	$ -	$ -	TBD														
XR044	44	3	ARROW ROAD	ARCHER ROAD TO HELMSMAN WAY	C11-2020 AQL	$ 1,580	$ -	1												X		
XR045	45	3	DELANDER/GENESTA CHANNEL	TOWN PROPERTY BEHIND DELANDER COURT AND GENESTA STREET	C11-2020 AQL	$ 1,746	$ -	1									X					
XR046	46	1	PALMETTO BUSINESS PARK	PONDS AT PALMETTO BUSINESS PARK	C11-2020 AQL	$ -	$ -	TBD														
XR047	47	3	BOYS & GIRLS CLUB	BOYS & GIRLS CLUB & FIRST TEE OF THE LOWCOUNTRY	C11-2020 AQL	$ 1,468	$ -	1												X		
XR048	48	5	WOODWARD AVENUE	END OF WOODWARD AVENUE & ALDER LANE	C11-2020 AQL	$ 3,125	$ -	1									X					
						$ 115,943	$ 51,282	50	3	3		3	1	3		4	1	5	27			

COMPLETE X **UNDERWAY** X **SCHEDULED** X

PLANNED X **ON HOLD** X **CANCELED** X

Notes

XR006	Capacity & work shelf project is completed pending final invoice payment (Q3); Bi-annual routine maintenace begins in 2021
XR014	Work shelf project is completed pending final invoice payment (Q3); Bi-annual routine maintenace begins in 2021
XR032	Capacity and workshelf restoration project completed (Q1); bi-annual routine maintenance begins in 2021
XR042	Work shelf project is on hold pending permanent easement.
XR043	Routine Mainenance scope will begin once pump station reconstruction is complete in FY22.
XR046	Routine maintenace scope and budget requirements will be reassessed once pond control structure and outfall system functionality is restored. Date TBD

TOWN OF HILTON HEAD ISLAND

STORMWATER UTILITY - FY21 REPAIR AND MAINTENANCE PROJECT SCHEDULE

Revised April 01, 2021

Project Assignments	
Reimbursement	1
Jeff Netzinger	5
Kelli Uyesugi	46
Erik Ladd	12
	64

Service Totals		BUDGET	ACTUAL
Maintenance Agreements	83%	$ 3,492,629	$ 384,159
Public System	17%	$ 694,277	$ 12,915
Total		$ 4,186,906	$ 397,074

C	COMPLETE
U	UNDERWAY
P	PLANNED

EVAL	SR #	PA	DESCRIPTION	Prog	BUDGET	ACTUAL	NOTES	Q1	Q2	Q3	Q4
INVENTORY & MODELING							(2)				
n/a	n/a	J	SOUTH FOREST BEACH/SEA PINES (SP041)	FY21B	$ 375,000		Thomas & Hutton			P	►
n/a	n/a	J	SHIPYARD / WEXFORD / NORTH FOREST BEACH	FY21B	$ 350,581		Woolpert			P	►
			TOTAL INVENTORY & MODELING		**$ 725,581**	**$ -**					
MAINTENANCE AGREEMENT CAPITAL PROJECTS											
SHIPYARD							(1)				
12	1523	K	GALLEON COURSE #8 TEE CULVERT REPLACEMENT (SH021)	FY21B	$ 25,000		internal design			C	
SEA PINES							(3)				
18	1403	E	SEA PINES PUMP STATION (SPP01)		$ 1,659,167				U	►	►
11	852	K	38 CANVAS BACK PIPE REPLACEMENT (SP034)	FY21B	$ 41,593	$ 39,200			C		
10	1089	K	MIZZENMAST/LIGHTHOUSE PIPE REPLACEMENT (SP043)	FY21B	$ 45,000						P
WEXFORD							(1)				
12	1021	K	WEXFORD CLUB DRIVE FLOODING (WE007) CHANNEL MAINTENANCE	FY21B	$ 13,000	$ 35,859			C		
			TOTAL PUD CAPITAL PROJECTS		**$ 1,783,760**	**$ 75,059**					
PUBLIC CAPITAL PROJECTS											
TOWN SYSTEM							(3)				
7	1152	K	104 CORDILLO PKWAY (HEDGES) DRAINAGE (XN082)	FY21B	$ 45,000		internal design				P
9	1352	K	400 William Hilton Parkway (The Oaks Pathway)	FY21B	$ 60,000		internal design				P
12	1499	J	Arrow Rd Pathway Crossing at Crossings Park Outfall	FY21B	$ 40,000		flap gate purchase				P
10	954	K	25 Moonshell Road (piping part of the Folly Field Ditch)	FY21C	$ 50,000						P
			TOTAL NON-PUD CAPITAL PROJECTS		**$ 195,000**	**$ -**					
MAINTENANCE AGREEMENT PROJECTS											
HILTON HEAD PLANTATION							(3)				
10	896	K	37 DEERFIELD RD DRAINAGE IMPROVEMENTS (HH039)	FY21B	$ 60,000	$ 59,531		C			
9	1227	R	Pine Island - Beach Renourishment	FY21B	$ 100,000		**reimbursement**				
12	1068	E	245 Seabrook Drive Weir Gate	FY21B	$ 15,000						P
INDIGO RUN							(4)				
6	872	K	4 DRUMMOND LN CHANNEL CLEAN (IR013)	FY21B	$ 23,940	$ 15,183	◄ combined w/ SR 1238		C		
9	1238	K	29 PRIMROSE CHANNEL MAINT (IR019)	FY21B	$ 8,000				C		
6	1124	K	53 ABERDEEN CT SINKHOLE/POINT REPAIR (IR020)	FY21B	$ 4,000	$ 2,000			C		
14	1295	K	46 Sussex Lane (Indigo Run) Pipe Cleaning & Sumps	FY21B	$ 17,500					U	►
LONG COVE							(1)				
6	1175	K	2 LONG BROW RD SINKHOLE / POINT REPAIR (LC007)	FY21B	$ 5,000	$ 1,500			C		
LEAMINGTON							(2)				
5	904	K	48 HEATH CT WEST POINT REPAIR / CLEAN (LM007)	FY21B	$ 5,000						P
6	1495	K	9 Niblick Court (Palmetto Dunes George Fazio GC 4th Fairway) CCTV	FY21B	$ 15,000						P
PALMETTO DUNES							(5)				
6	1242	K	FLOTILLA SINKHOLE REPAIR (PD027)	FY21B	$ 11,000						P
6	1241	K	DINGHY LN SINKHOLE REPAIR (PD028)	FY21B	$ 10,000						P
6	1244	K	1 LONG BOAT SINKHOLE REPAIR (PD029)	FY21B	$ 10,000						P
6	1243	K	2 HIGH RIGGER SINKHOLE REPAIR (PD030)	FY21B	$ 9,500						P
10	1313	K	29 Starboard Tack Pipe Replacement	FY21B	$ 9,000	$ 9,300		C			
PALMETTO HALL							(3)				
9	1231	K	25 LENOX TO 19 CLYDE LAGOON PIPE CLEANING (PH011)	FY21B	$ 44,848	$ 50,112			C		
7	1312	K	32 Madison Lane Inlet Replacement	FY21B	$ 1,000						P
11	1519	J	Palmetto Hall System Outfall at Fish Haul Rd	FY21B	$ 50,000		CONSULTANT DESIGN				P
PORT ROYAL							(7)				
6	1210	E	16 BARNACLE RD PIPE CLEAN / CHANNEL MAINT (PR029)	FY21B	$ 3,000						P
6	1211	E	16 COQUINA RD PIPE CLEAN / CHANNEL MAINT (PR030)	FY21B	$ 3,000						P
6	1212	E	16 DONAX RD PIPE CLEAN / CHANNEL MAINT (PR031)	FY21B	$ 3,000						P
8	1395	K	12 Scarborough Head (Ditch & Pipe Cleaning)	FY21B	$ 12,000						P
8	1482	K	3 Wimbledon Ct (Grasslawn/S. Port Royal median) Pipe Replacement	FY21B	$ 15,000						U
9	1496	K	61 S. Port Royal Drive Point Repair	FY21B	$ 2,500	$ 2,500		C			
9	1520	K	5 Resolute Place Channel Maintenance	FY21B	$ 15,000	$ 16,254		C			
SEA PINES							(13)				
11	1236	E	LAWTON PUMP STATION OUTFALL GATE REPAIR (SP038)	FY21B	$ 3,000						P
7	1335	K	16 Wagon Road Point Repair	FY21B	$ 10,000						P
7	1432	E	135 Lighthouse Road (Flap Gate)	FY21B	$ 9,000						P
7	1492	K	3 Governors Road Point Repair	FY21B	$ 5,000						P
8	1423	K	13 Genoa Court (upstream Mizzenmast Ct system) Pipe Replacement	FY21B	$ 115,000					C	
9	1040	E	30 Governors Road- Near Clubhouse Entrance near Hole #10 Gate Repair	FY21B	$ 7,000		quote received				P
9	1289	K	226 Portside Drive (Lagoon Villas) Pipe Replacement/Ditch	FY21B	$ 29,000		permit received				P
9	1398	E	20 Audubon Pond Drive Flap Gate Replacement	FY21B	$ 11,000		quote needed				P
10	1399	E	1 Baynard Cove Road (Baynard Cove Outfall) Gate Cleaning & Repair	FY21B	$ 24,000		ON HOLD				
10	1463	K	18 Surf Scoter Road (Beach Pathway 26) Pipe Replacement	FY21B	$ 24,000					C	
11	1336	K	33 Battery Road CCTV & Pipe Replacement	FY21B	$ 28,000				U	C	
12	1400	K	35 Lawton Drive Channel Maintenance	FY21B	$ 7,000						P
14	1402	K	4 Snowy Egret Road (Beach Access Marker 25) Pipe Replacement	FY21B	$ 48,000	$ 42,407			C		
SHIPYARD							(4)				
13	1408	K	63 Shipyard Drive (Shipmaster) Channel Excavation	FY20C	$ 25,000	$ 92,413			C		
9	1412	K	45 Shipyard Drive Point Repair	FY21B	$ 5,000	$ 2,900			C		
13	1485	K	Intersection of Barcelona Drive and Shipyard Drive Pipe Replacement	FY21B	$ 5,000	$ 9,000				C	
14	1424	K	200 Colonnade Rd (Galleon 6 F'way) Sonesta Outfall System	FY21B	$ 21,000	$ 6,000				C	
11	1526	K	90 Gloucester Road (Harbourmaster) Pipe Cleaning & Channel Excavation	FY21C	$ 15,000						P
11	1534	K	48 Kingston Road (Pipe Cleaning and Lagoon Excavation)	FY21C	$ 12,000					C	
WEXFORD							(1)				
11	1525	K	PRIM CHL, RM WEXFORD POWERLINE RV PARK DITCH (WE008)	FY21B	$ 15,000				U	C	
			PUD MAINTENANCE CONTINGENCY (CP000)		**$ 73,000**						
			TOTAL PUD MAINTENANCE PROJECTS		**$ 943,288**	**$ 309,100**					
PUBLIC MAINTENANCE PROJECTS											
TOWN SYSTEM							(8)				
LADD			NON-PUD MAINTENANCE (XN000)	FY21B	$ 260,000		refer to RM program				
EBER			STREET SWEEPING (XN066)	FY21B	$ 98,000		ongoing weekly schedule				
11	827	J	54 SHAMROCK / COBIA CT DRAINAGE IMPRVMTS (XN081)	FY21B	$ 23,277		internal dgn/County to install			U	
7	1305	E	50 Dillon Road (WHP- Planters Row GC) Pathway Flooding	FY21B	$ 5,000		part of C11-2020-JO19		C		
7	1498	K	32 Office Park Road Inlet Repair	FY21B	$ 2,000						P
7	1455	K	316 Squire Pope Road Pipe Cleaning	FY21B	$ 2,000						P
9	1324	K	271 William Hilton Parkway (Island Tire) Workshelf/Channel Maintenance	FY21B	$ 66,000		deferred ► FY22				
9	1428	K	89 Squire Pope Road Pathway Flooding	FY21B	$ 15,000		Survey				P
10	1338	E	10 Bow Circle (Arrow Road Ditches) Channel Maintenance	FY21B	$ 35,000		on hold, int dgn rqd				P
13	1522	K	59 Shelter Cove Lane (Veteran's Memorial Park) Dam Repair	FY21B	$ 18,000	$ 12,915			C		
			CONTINGENCY		**$ -**						
			TOTAL NON-PUD MAINTENANCE PROJECTS		**$ 524,277**	**$ 12,915**					
PUMP STATION MAINTENANCE PROJECTS							(1)				
LADD			SHIPYARD PUMP STATION (SHP00)	FY21B	$ 15,000		annual pump maint			P	
LADD			WEXFORD PUMP STATION (WEP00)	FY21B	$ 25,000		annual pump maint			P	
LADD			JARVIS PUMP STATION (XNP00 & XNP01)	FY21B	$ 15,000		annual pump maint			P	
			PUMP STATION CONTINGENCY (CGP00)		**$ 10,000**						
			TOTAL PUMP STATION MAINTENANCE PROJECTS		**$ 65,000**	**$ -**					

TOWN COUNCIL

STAFF REPORT
Engineering Department

MEETING DATE:	April 13, 2021
SUBJECT:	Engineering Department Monthly Report
PROJECT MANAGER:	Bryan McIlwee, Director of Engineering

CAPITAL IMPROVEMENTS PROGRAM (CIP) AND SPECIAL PROJECTS UPDATE

PATHWAYS

1. Goethe-Shults Sidewalks Phase 2

- Council approved contract with JS Construction at the March meeting.
- Contract is under Department of Commerce review.
- **Next Steps**
  - Receive final contract from Commerce for routing.
  - Issue JS Construction a Notice to Proceed with construction.

2. Buck Island-Simmonsville Neighborhood Sidewalks and Lighting

- Phase 5 Kitty Road to 301 Buck Island Road, construction is complete. Design of street lighting is underway.
- Phase 6A along Simmonsville Road from Grayco northward to Sugaree Drive is under design and permit review. Invitation to bid to be posted in April.
- Phase 6B along Simmonsville Road from Sugaree Drive northward to the existing New Mustang Road sidewalks is under design.
- **Next Steps**
  - Submit Phase 5 street lighting for an SCDOT encroachment permit. Install street lighting in the second quarter of 2021.
  - Phase 6 design and construction of the remaining Simmonsville Road sidewalks, to be completed in FY 2021-2022.

3. Bridge Street Streetscape

- Construction documents and permitting are underway for Phase 1 streetscape, Burnt Church Road to Calhoun Street. 90% construction drawings are complete and Staff provided plan comments to Cranston Engineering.
- SCDHEC 319 grant application was awarded for $179,700 for drainage and water quality improvements.

- **Next Steps**
  - Complete engineering design in April 2021.
  - Prepare easement plats, appraisals, obtain easements and issue bid documents in FY 2021.
  - Construction to start in FY 2022.

4. Boundary Street Streetscape

- Engineering Design underway
- **Next Steps**
  - Complete draft preliminary engineering design in April.

5. New Riverside Linear Trail

- **Next Steps**
  - Begin surveying and prepare a Conceptual Master Plan in FY 2022, pending budget approval.
  - Research grant opportunities to fund planning and construction of future trail improvements.

SEWER & WATER

1. Buck Island-Simmonsville Sewer (Phases 5A-5D)

- Construction is underway on Phase 5A-D.
- **Next Steps**
  - Complete construction on Phase 5A-D by 7/1/21 contingent upon no extensive weather delays or unforeseen utility conflicts.
  - Start house connections after the main line is approved by DHEC.

2. Historic District Sewer Extension Phase 1 - Pritchard Street

- Main line construction is underway.
- **Next Steps**
  - Start house connections after the main line is permitted by DHEC.
  - Once construction project is complete, Pritchard Street will be resurfaced from the intersection of Tabby Shell Road south to the intersection of Bridge Street. The resurfacing will cover both lanes of travel.

3. Historic District Sewer Extension Phase 2 - Bridge Street

- Received SCDHEC permit to construct.
- Continue negotiations with property owners for right of entry agreements.
- **Next Steps**
  - Obtain road ownership from SCDOT.
  - Advertise for bids.

4. Historic District Sewer Extension Phase 3 – Colcock Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

5. Historic District Sewer Extension Phase 4 – Lawrence Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

6. Historic District Sewer Extension Phase 5 – Green Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

7. Historic District Sewer Extension Phase 6 – Water Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

HISTORIC DISTRICT IMPROVEMENTS

1. Boundary Street Lighting

- Phase 2 photometric plans, encroachment permits and lighting agreements are complete and approved.
- Dominion Energy is negotiating modifications to SCDOT encroachment permits.
- SCDOT and Dominion indicated poles must be installed on Private Property due to conflicts with Sewer Force Main and communication utilities along Boundary Street. Easements must now be obtained to install Phase 2 lighting.
- **Next Steps**
  - Obtain easements as needed for Phase 2 street lighting.
  - Begin installation of street lighting in June 2021.

2. Historic District Enhancements

- Watershed Management Staff is finalizing plans to construct Boundary Street drainage improvements at AME Church.
- Traffic calming guidelines and plan are being negotiated with engineering consultant.
- **Next Steps**
  - ADA ramps and crosswalks mapped in Cartegraph by GIS/IT.
  - Continue planning of crosswalks and ADA improvements.
  - Complete Traffic Calming Assessment and Plan.

3. Calhoun Street Streetscape

- Conceptual Master Planning is complete and reviewed at the July Quarterly Workshop.
- Obtained contract approval for Engineering services at the January 2021 Town Council meeting
- Project Kick-off meeting on 1/28/2021
- Surveying and Engineering Design underway
- **Next Steps**
  - Engineering design is underway and Preliminary Design to be complete in April.

4. Squire Pope Carriage House Preservation

- Construction Documents are complete and submitted to SHPO for a courtesy review.
- **Next Steps**
  - Finalize any modifications to the Construction Documents to include a stabilization phase of building in FY 22.
  - Prepare bid solicitation package in FY 22.
  - Awaiting budget approval for future construction funding.

PARK DEVELOPMENT

1. Oyster Factory Park

- Conceptual Master Plan has been updated and reviewed by Town Council at the January Quarterly Workshop.
- **Next Steps**
  - Obtain ACOE and DHEC Permit for installation of salvaged dock components from Calhoun Street.
  - Begin final design of next phase of improvements per Town Council direction provided at the Workshop.

2. 68 Boundary Street Park Renovations

- Construction and maintenance contracts complete.
- Park dedication

3. Calhoun Street Dock and Public Riverfront Access Improvements

- Dock construction is complete.
- **Next Steps**
  - Complete installation of Dock signage.

4. Wright Family Park

- Park Construction complete.
- Obtaining Quotes to add HVAC to Restroom Building
- **Next Steps**
  - Coordinate ribbon cutting ceremony as pandemic allows.
  - Prepare change order for HVAC installation.

5. Oscar Frazier Park

- Sidewalk construction complete.
- **Next Step**
  - Add benches and regrade fields in FY 22.
  - Continue planning of future improvements in FY 22.

6. New Riverside Barn/Park

- Submitted grant application to LWCF for $500,000.00 funding of the initial phase of the project. Application is under review by NPS.
- Archeological Report complete as needed for Grant eligibility.
- Obtained Town Council approval of the Conceptual Master Plan at the December 2020 Council meeting.
- Executed contracts with Thomas and Hutton for Phase 1 Engineering design.
- Hart Howerton completed Design Development of Phase 1 Site Development and Restroom building.
- **Next Steps**
  - Hart Howerton to complete schematic design of Barn additions.
  - Obtain quotes for construction documents from local Architects for Restroom Building.
  - Complete construction drawings, cost estimating and permitting of Phase 1 site development by July 2021.
  - Phase 1 bidding and construction anticipated to begin in FY 2022.

TOWN FACILITIES AND MISCELLANEOUS PLANNING

1. Buckwalter Place Multi-County Commerce Park

- Buckwalter Place Park and Veterans Memorial are complete. Executed contracts for Buckwalter Park restroom design with Thomas and Hutton and Pearce Scott Architects.
- Site planning for future development parcel underway with Cranston Engineering.
- **Next Steps**
  - Review progress plans for restroom building and utility extensions at Buckwalter Park.
  - Continue site planning for future development parcel.

2. Town of Bluffton Housing Project

- Surveying and geotechnical services complete for 1095 May River Road and 115 Bluffton Road sites.
- **Next Steps**
  - Planning and design to begin in FY 2021 as directed by Joint Venture Agreement.
  - Assist with the preparation of a comprehensive cost estimate for planning, design and construction for the various housing projects.

3. Law Enforcement Center Facility Improvements

- Parking and Service Yard Expansion construction began in December 2020 with CBG

Siteworks Construction.

- Interior paint of Substation complete.
- **Next Steps**
  - Continue construction of LEC service yard and parking improvements. Construction anticipated to be complete by the July 2021.
  - Information Technology department coordinating upgrades to building security systems.

4. Ghost Roads

- Surveying and easement exhibits are complete.
- Pritchard Street Quit Claim Deed exhibits are 95% complete.
- The Town Attorney is working with Bridge Street property owners to obtain Quit Claim Deeds and agreement to extend service to homes.
- Staff is meeting with individual property owners to raise awareness of the acquisition efforts and communicate next steps.
- **Next Steps**
  - Continue meeting with individual property owners and obtaining quit claim deeds.

5. Community Safety Cameras

- Cameras have been installed at Bluffton Road Public Parking Lot, Veterans Park, Wright Family Park, Calhoun Street Dock.
- Fourteen older cameras in the network have been replaced.
- **Next Steps**
  - Continue with camera replacements and upgrades as necessary.

6. Public Works Facility Improvements

- Finalize the plans for expanding of Public Works yard.
- Install new plumbing/ electric for the washer and dryer.
- **Next Steps**
  - Begin permitting and bid for the expansion of the yard.
  - Bid the installation of the plumbing and electric.

7. Rotary Community Center Facility Improvements

- Replace the hardwood floor in the main area.
- **Next Steps**
  - Request bids for the replacement of the new floor.

8. Watershed Management Facility Improvements

- Remove the carpet and install new flooring in the rear office space.
- **Next Steps**
  - Request quotes on completing the new flooring in the office.

DIVISION/STAFF UPDATES

Project Management

Thirty-five (35) CIP projects are currently in progress. Don Ryan Center, Veteran Memorial, Buckwalter Park and BIS Phase 5 sidewalks, Wright Family Park and the Calhoun Street Dock have recently been completed. CIP projects including BIS Phase 5E sewer, and Pritchard Street sewer are currently under construction and nearing completion. The LEC Parking Expansion, BIS Phase 5A-D Sewer started construction in December 2020, and the Boundary Street Lighting project is expected to start construction in May 2021. The remaining CIP projects are in the design phase and several are planned for construction in FY 2022.

Watershed Management

1. Southern Lowcountry Regional Board (SoLoCo)

a. Regional Southern Lowcountry Post Construction Stormwater Ordinance and Design Manual

- Via concurrence of the Mayor and direction by the Town Manager, staff has participated in the SoLoCo Technical Working Group to develop a regional stormwater model ordinance and design manual and investigate the viability of a regional stormwater authority.
- Beaufort County adopted the SoLoCo Stormwater ordinance and design manual and began implementation 2/1/21.
- 2/9/21 Town Council tabled the item until 4/13/21.
- **Next Steps**
  - Additional public comments received will require more staff time to resolve prior to bringing back to Council for Public Hearing and second reading.

2. Sea Level Rise Task Force

- Following Beaufort County's presentation and request for regional participation at the 10/22/19 SoLoCo meeting, staff attended the Sea Level Rise Task Force meetings to discuss a possible No Fill Ordinance and county-wide sea level rise adaptation strategies.
- Task Force met 12/15/20 and 12/18/20 to prioritize recommendations for final document with strategies for local governments to implement policies, ordinances and projects to mitigate the potential impacts of sea level rise.
- **Next Steps**
  - Beaufort County to present and request a recommendation from SoLoCo for regional partners to adopt.

3. Joint Councils Meeting for Watershed Management Initiatives

- BJWSA developed their CIP list for FY 2020 sewer projects which does not include any projects in the County's jurisdiction in the May River Headwaters without cost-sharing.
- Following the Joint Councils Meeting with BJWSA, held on 2/25/20, staff from

Beaufort County and Town of Bluffton met to discuss sewer extension scope and strategy on 2/27/20.

- Staff from the Town, County, and BJWSA met via Zoom 3/27/20 to confirm project scope, cost, and potential project manager. the last project cost estimate to extend, connect, and abandon septic in the Stoney Creek project area is $4.7 million (B. Chemsak email 7/22/19) but they anticipate those numbers increasing to $5.5 million. The proposal is 1/3 cost-share, so the Town's portion would be approximately $1.83 million. Beaufort County has not formally agreed or committed any funding.
- Neither BJWSA nor Beaufort County have committed funds in FY 2021 to begin sewer extension.
- Town Manager, Director of Engineering and staff met with BJWSA General Manager, Engineer and staff on 6/5/20 to discuss how to move the project forward.
- The Town submitted a response on 12/18/21 to BJWSA's "call for projects" request that prioritizes May River Watershed sewer projects.
- Staff drafted a letter for the Town Manager's review requesting Beaufort County commit to cost-sharing sewer projects in the May River watershed.
- **Next Steps**
  - Staff to present another update on current status at 4/20/21 Town Council Workshop.

4. SC Department of Health and Environmental Control May River Shellfish Harvesting Monitoring Data Year-to-Date and May River Shellfish Harvesting Status Exhibit – Attachments 1 and 1a

5. May River Watershed Action Plan Implementation Summary - Attachment 2

6. Municipal Separate Storm Sewer System (MS4) Program Update

- Staff is currently updating the Town's MS4 Stormwater Management Plan and supporting documentation. SCDHEC is currently in the process of developing a revised National Pollutant Discharge and Elimination (NPDES) Permit for Small MS4s and will re-issue to permittees, including the Town, in the future.

7. MS4 Minimum Control Measure (MCM) - #1 Public Education and Outreach, and MS4 MCM - #2 Public Participation and Involvement

- Beaufort County Stormwater Utility Board meeting held on 3/10/21.
- The May River Watershed Action Plan Advisory Committee meeting canceled for 3/25/21. **Attachment 3**
- Staff is working the Town Digital Communication Manager to promote a series of MS4 stormwater educational tips and reminders for the Bluffton community via the Town's Facebook page.

8. MS4 MCM – #3 Illicit Discharge Detection and Elimination

- Stormwater Infrastructure Inventory Map - **Attachment 4a**
- *E. coli* Concentrations Trend Map - **Attachment 4b**

- Monthly, Microbial Source Tracking (MST) Maps - **Attachments 4c and 4d**
  - Town staff coordinates with the SC Department of Health and Environmental Control (SCDHEC) to pull MST samples concurrently with the state's routine shellfish harvesting water quality sampling at stations 19-19, 19-19A, 19-19B, 19-19C, and 19-24. SCDHEC will conduct sampling on 3/15/21. Staff will notify Council and Senior Staff of any pertinent findings from this sampling event via email.
  - Town staff collected seventeen (17) MST samples on 2/15/21 following approximately 2.19 inches of rainfall over seven (7) days. Staff notified Council and Senior Staff of pertinent findings on 3/10/21. Staff has requested the analyses of the remaining samples and will continue to communicate with Council and Senior Staff regarding results.
- Illicit Discharge Investigations – **Attachment 4e**

9. MS4 MCM – #4 Construction Site Stormwater Runoff Control – Attachment 5

10. MS4 MCM – #5 Stormwater Plan Review and Related Activity – Attachment 6

11. MS4 MCM – #6 Good Housekeeping (Staff Training/Education)

- Town Staff attended SC Association of Stormwater Managers training on 3/4/21 for asset management.
- Staff participated in an Emergency Management Planning Group meeting on 3/11/21.
- Staff conducted a virtual guest lecture for Berry College's Ocean Sciences class on 3/19/21 on "Coastal Resource Management in Changing Conditions."

12. Citizen Drainage, Maintenance, and Inspections Concerns Map – Attachment 7

13. Citizen Request for Watershed Management Services & Activities – Attachment 8

<u>Public Works</u>

1. MS4 MCM – #6 Good Housekeeping (Ditch, Drainage and Roadside Maintenance)

- Performed weekly street sweeping on Calhoun Street, Highway 46, Bruin Road, May River Road, Pin Oak Street, and curbs and medians on Simmonsville and Buck Island Roads.
- Performed ditch inspections
  - Arrow ditch (2,569 LF)
  - Red Cedar ditch (966 LF)
  - Buck Island roadside ditch (15,926 LF)
  - Simmonsville roadside ditch (13,792 LF)
- Ongoing roadside mowing, litter clean-up and maintenance of Masters' Way, McCracken Circle, Hampton Parkway, Buck Island and Simmonsville Roads, Goethe Road, Shults Road, Jason and Able Streets, Whispering Pine Road, May River Road and Eagles Field.

- Ongoing mowing of the New River side trail and field at New River barn.
- Beautification Program –Landscape Maintenance - ongoing routine.

2. Facilities

- Facilities and Parks Maintenance - ongoing routine.

3. Public Works Activities Report - Attachment 10

Attachments

1. SCDHEC Shellfish Harvesting Monitoring Data Year-to-Date
   a. SCDHEC May River Shellfish Harvesting Status Exhibit
2. May River Watershed Action Plan Implementation Summary*
3. MS4 Minimum Control Measures #1 and #2 – May River Watershed Action Plan Advisory Committee Cancelation Notice
4. MS4 Minimum Control Measure #3 – Illicit Discharge Detection and Elimination
   a. Stormwater Infrastructure Inventory Map
   b. *E. coli* Concentrations Trend Map
   c. Microbial Source Tracking Trend Map – Human Source
   d. Microbial Source Tracking Map – All Sources
   e. Illicit Discharge Investigations
5. MS4 Minimum Control Measure #4 – Construction Site Stormwater Runoff Control
6. MS4 Minimum Control Measure #5 – Stormwater Plan Review and Related Activity
7. Citizen Drainage, Maintenance and Inspections Concerns Map
8. Citizen Request for Watershed Management Services and Activities Map
9. Beautification Committee Agenda
10. Public Works Activities Report
11. CIP Project Schedules

* Attachment noted above includes the latest updates in bold and italic font.

SCDHEC Shellfish Harvesting Monitoring Data Year-to-Date
May River Headwaters Shellfish Stations

ATTACHMENT 1

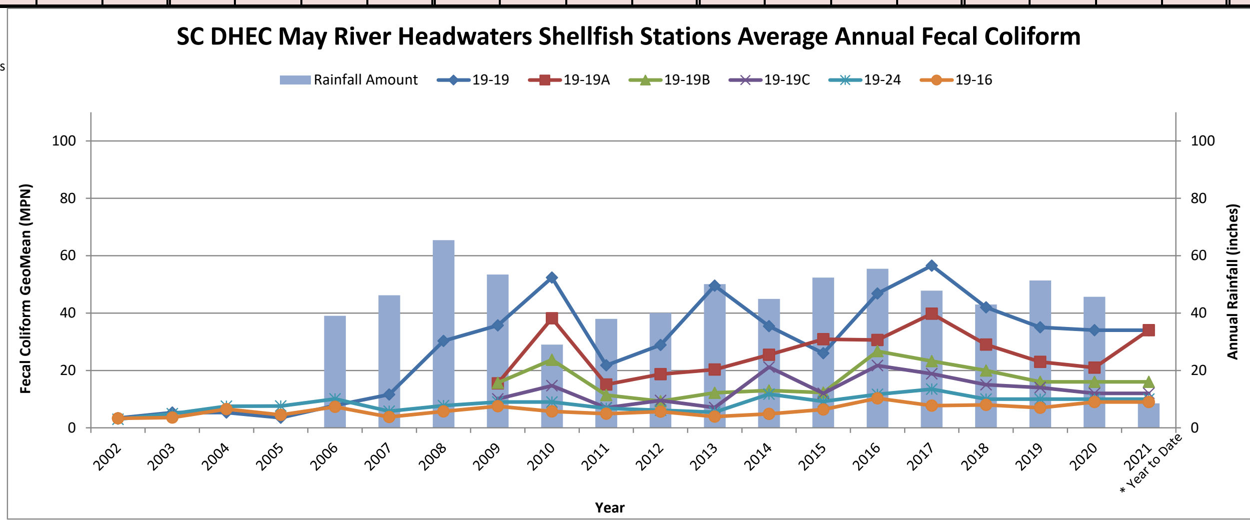
	19-19				19-19A				19-19B			
	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)
December	79.0	170.0	17.0		49.0	33.0	22.0		33.0	140.0	17.0	
November	49.0	17.0	70.0		13.0	6.8	31.0		23.0	7.8	17.0	
October	79.0	7.8	49.0		23.0	4.5	79.0		7.8	2.0	31.0	
September	49.0	79.0	110.0		23.0	33.0	49.0		13.0	6.8	49.0	
August	70.0	70.0	49.0		23.0	49.0	49.0		13.0	33.0	23.0	
July	23.0	4.5	33.0		33.0	13.0	13.0		11.0	7.8	23.0	
June	11.0	33.0	NS		23.0	49.0	NS		23.0	49.0	NS	
May	17.0	7.8	70.0		33.0	9.2	49.0		17.0	7.8	23.0	
April	33.0	23.0	33.0		13.0	13.0	33.0		17.0	7.8	13.0	
March	22.0	23.0	170.0		21.0	23.0	49.0		4.5	6.8	130.0	
February	17.0	64.0	17.0	79.0	7.8	33.0	7.8	70.0	17.0	23.0	21.0	79.0
January	13.0	23.0	95.0	17.0	2.0	23.0	33.0	17.0	4.5	13.0	33.0	13.0
Additional Samples												
Additional Samples												
Average Annual GeoMean	30.8	26.4	51.4	36.6	17.5	19.0	31.9	34.5	13.1	13.0	27.3	32.0
** Truncated GeoMetric Mean	42.0	35.0	34.0	34.0	29.0	23.0	21.0	34.0	20.0	16.0	16.0	16.0
** Truncated 90th Percentile	176.0	168.0	106.0	106.0	115.0	89.0	59.0	106.0	71.0	63.0	50.0	50.0

	19-19C				19-24				19-16			
	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)
December	46.0	33.0	4.5		23.0	13.0	4.0		21.0	110.0	11.0	
November	17.0	11.0	13.0		17.0	4.5	13.0		7.8	2.0	4.5	
October	7.8	4.5	21.0		7.8	1.8	33.0		2.0	2.0	79.0	
September	17.0	17.0	33.0		17.0	4.5	33.0		17.0	1.8	33.0	
August	4.5	22.0	23.0		7.8	7.8	17.0		17.0	17.0	22.0	
July	7.8	17.0	7.8		13.0	22.0	7.8		4.5	13.0	17.0	
June	7.8	46.0	NS		4.5	13.0	NS		1.8	4.5	NS	
May	13.0	2.0	22.0		23.0	6.8	6.8		13.0	4.5	4.5	
April	17.0	6.8	6.8		49.0	23.0	13.0		17.0	6.8	13.0	
March	11.0	13.0	49.0		7.8	7.8	70.0		9.3	4.5	33.0	
February	17.0	31.0	4.5	23.0	2.0	6.8	4.5	7.8	7.8	13.0	6.8	6.8
January	2.0	33.0	17.0	23.0	1.8	7.8	17.0	17.0	4.5	23.0	17.0	13.0
Additional Samples												
Additional Samples												
Average Annual GeoMean	10.7	14.5	14.0	23.0	9.8	8.0	13.8	11.5	7.9	7.5	15.3	9.4
** Truncated GeoMetric Mean	15.0	14.0	12.0	12.0	10.0	10.0	10.0	10.0	8.0	7.0	9.0	9.0
** Truncated 90th Percentile	56.0	52.0	37.0	37.0	44.0	38.0	31.0	31.0	30.0	32.0	35.0	35.0

NS = No Sample

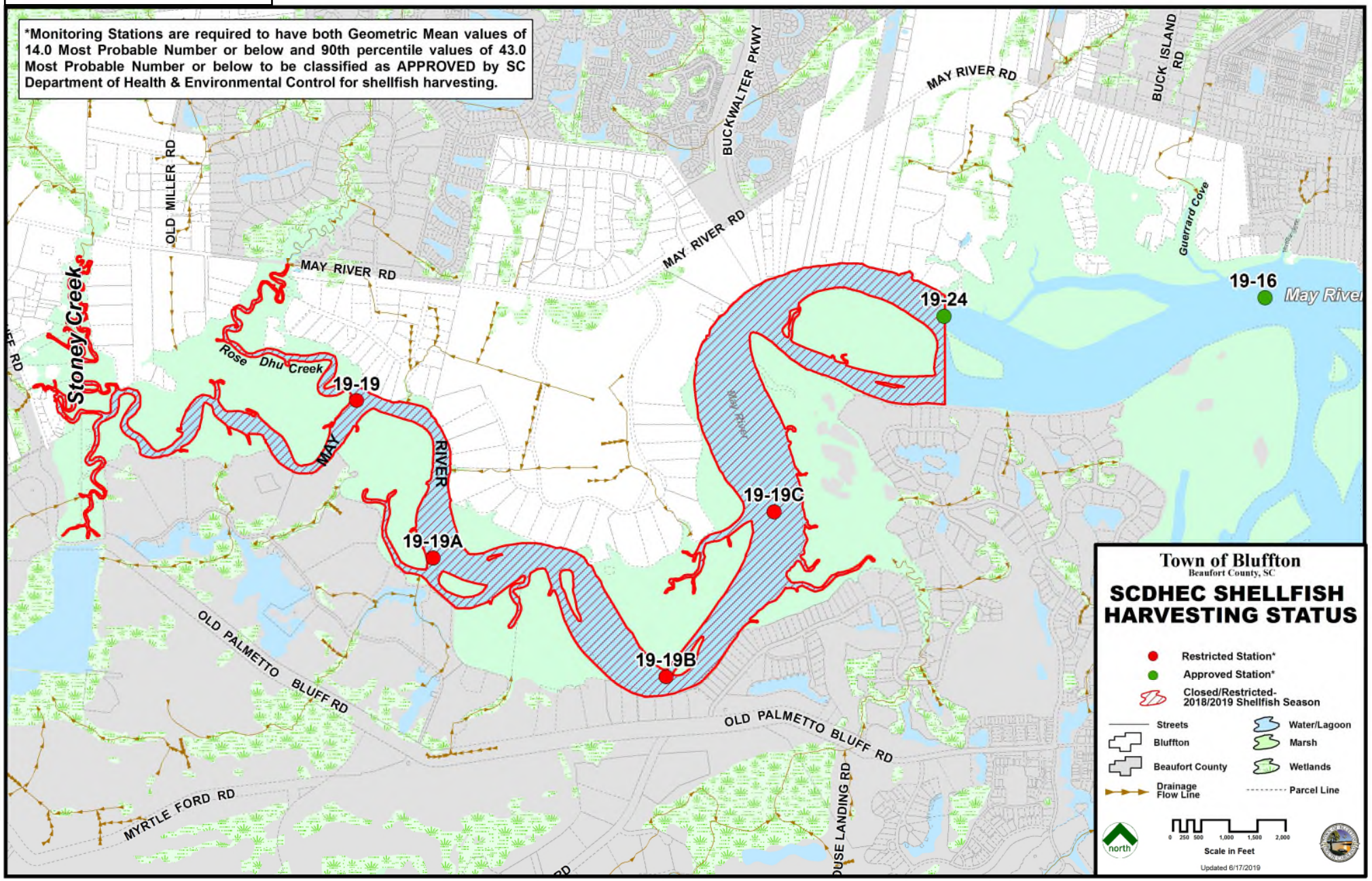
AS = Additional Samples

** Town staff calculations utilizing DHEC statistics



ATTACHMENT 1a

May River Headwaters



ACTIVITY - FINANCIAL	STATUS
Funding Opportunities	Council unanimously adopted $115 SWU Fee and NPDES-related Fees on 6/9/20.
ACTIVITY - POLICIES	**STATUS**
Sewer Connection & Extension Policy	*Completed 2017.*
Septic to Sewer Conversion Program	*Completed 2018.*
Sewer Connection Ordinance and Ordinance Amendment	*Completed 2015 and 2018, respectively.*
Southern Lowcountry Regional Stormwater Ordinance and Design Manual	***Current project updates are included in Engineering Consent Agenda under "Southern Lowcountry Regional Board (SoLoCo)."***
ACTIVITY - PROJECTS	**STATUS**
Sanitary Sewer Extension	Completed Buck Island/Simmonsville Road (BIS) Phases I, II, III, IV; Toy Fields; Jason/Able; and Poseys Court. Six project phases of Historic District sewer extension are proposed in the 5-year Capital Improvement Program. ***Current project updates are included in Engineering Consent Agenda under "Sewer & Water."***
May River 319 Grant Phase 1 - New Riverside Pond (Grant award of $483,500 in 2009)	*Completed 2013.*
May River 319 Grant Phase 2 - Pine Ridge (Grant award of $290,000 in 2011)	*Completed 2016.*
May River 319 Grant Phase 3 - Town Hall Parking Retrofit (Grant award of $231,350 in 2016)	*Completed 2019*.
May River 319 Grant Phase 4 - Sanitary Sewer Connections (Grant award of $365,558.36 in 2019)	Grant to construct 49 sewer lateral connections in Poseys Court, Little Aaron and Historic District Phases 1 and 2. ***Current project updates are included in Engineering Consent Agenda under "Sewer & Water."***
May River 319 Grant Phase 5 - Bridge Street Streetscape (Grant award of $179,900 in 2020)	Supports enhanced drainage and water quality improvements as part of the Bridge Street Streetscape project. ***Current project updates are included in Engineering Consent Agenda under "Pathways."***
Stoney Creek Wetlands Restoration: Preliminary Design Phase	Project on hold following Council direction on 5/31/17.
May River Watershed Action Plan Update & Modeling Report	*Completed 2021. Town Council adopted the document as a supporting document to the Comprehensive Plan on 2/9/21.*
ACTIVITY - PROGRAMS	**STATUS**
Public Outreach/Participation/Involvement (MS4 Minimum Control Measures #1 & 2)	Outreach and involvement efforts continue through county-wide partnership with Carolina Clear as Lowcountry Stormwater Partners - Neighbors for Clean Water, through local cleanups, civic group presentations, and the May River Watershed Action Plan Advisory Committee. ***Current updates are included in Engineering Consent Agenda and Attachment 3.***
Infrastructure Mapping/GIS (MS4 Minimum Control Measure #3)	Data points continue to be collected with new development to meet MS4 requirements & populate water quality model. ***Current updates are included in Engineering Consent Agenda Attachment 4a.***

ACTIVITY - PROGRAMS continued	STATUS continued
Water Quality Monitoring Program (MS4 Minimum Control Measure #3)	1. SCDHEC Shellfish monitoring results and map 2. *E. coli* bacteria "hot spot" concentrations 3. Microbial Source Tracking of bacteria 4. Illicit Discharge investigation and monitoring 5. BMP efficacy monitoring 6. MS4 monitoring ***Current updates are included in Engineering Consent Agenda Attachments 1, 1a, 4b - 4d.***
Illicit Discharge Detection & Elimination (IDDE) Program (MS4 Minimum Control Measure #3)	Response to reported and observed non-stormwater discharges to the stormwater drainage system. ***Current updates are included in Engineering Consent Agenda Attachment 4e.***
Construction Site Stormwater Runoff Control Program (MS4 Minimum Control Measure #4)	Sediment and erosion control inspections with escalating enforcement response. ***Current updates are included in Engineering Consent Agenda Attachment 5.***
Stormwater Plan Review & Related Activity Program (MS4 Minimum Control Measure #5)	SCDHEC delegated plan review-related activities. ***Current updates are included in Engineering Consent Agenda Attachment 6.***
Ditch Inspection/Maintenance Program (MS4 Minimum Control Measure #6)	Continued coordination with SCDOT, Beaufort County and Town Public Works to inspect and maintain ditches within the Town's jurisdiction. ***Current updates are included in Engineering Consent Agenda Attachment 7.***
Neighborhood Assistance Program - Septic System Maintenance Program	On-going assistance offered to Town residents regardless of financial status through Neighborhood Assistance Program (NAP). ***Current updates are provided in Growth Management Consent Agenda.***

PUBLIC NOTICE

The May River Watershed Action Plan (WAPAC) Meeting scheduled for

Thursday, March 25, 2021, at 9:00 a.m.

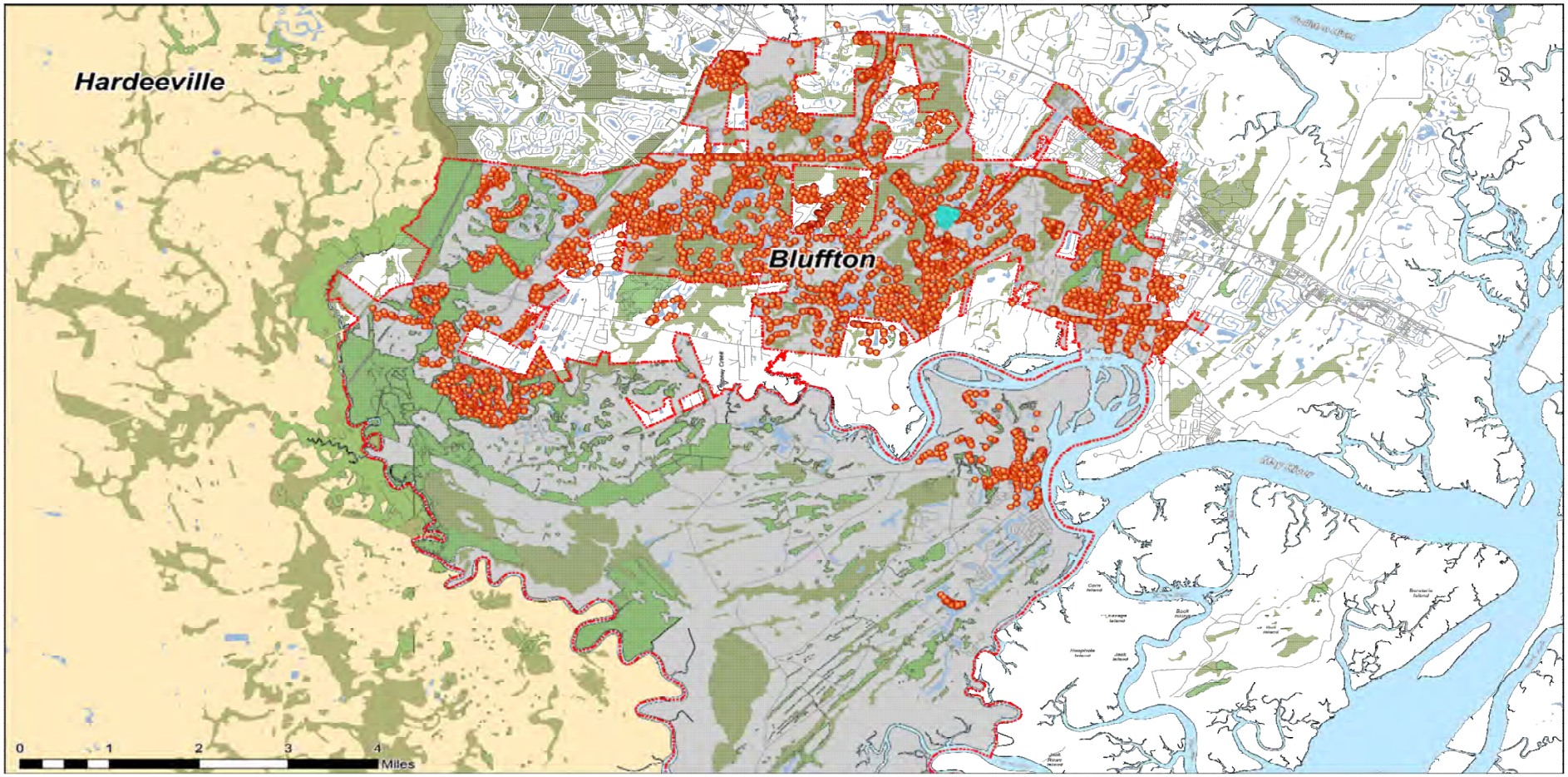
Has been CANCELED
due to lack of a Quorum

The next meeting is scheduled for
Thursday, April 22, 2021

If you have questions, please contact
Engineering at: 843-706-4599

ATTACHMENT 4a

MS4 Minimum Control Measure #3 – IDDE (Illicit Discharge Detection & Elimination): Stormwater Infrastructure Inventory



SW STRUCTURE
SW PIPE
TOWN OF BLUFFTON
BEAUFORT COUNTY
JASPER COUNTY
WETLAND
WATER
ROADS

Town of Bluffton
Beaufort County, SC

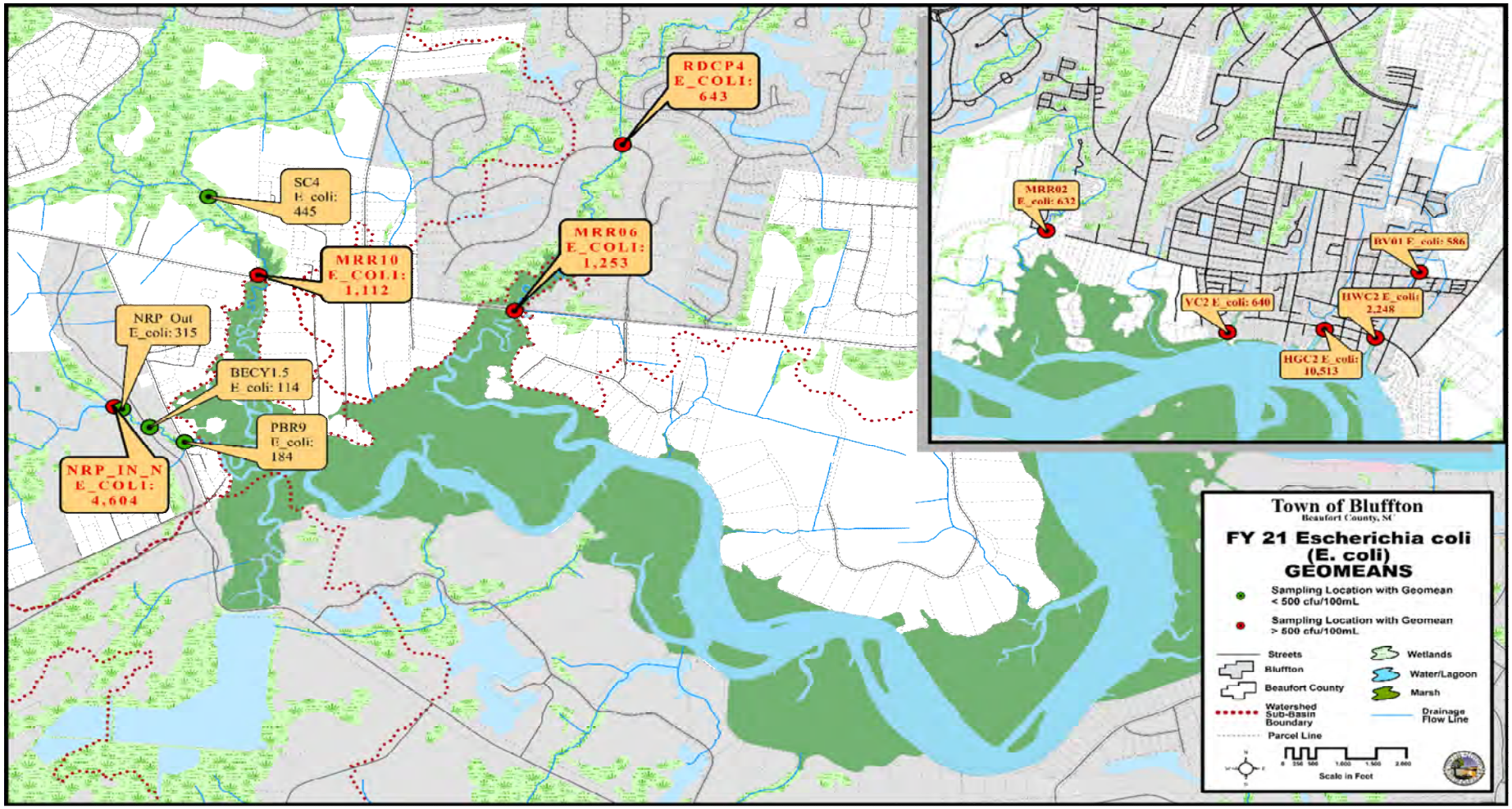
STORMWATER INFRASTRUCTURE

Updated Date: 1/19/2021

Stormwater Infrastructure Inventory Collection Status	
FY 2021 YTD Collection Totals	992
FY 2020 Collection Totals	4,878
FY 2019 Collection Totals	2,925
FY 2018 Collection Totals	3,777

ATTACHMENT 4b

MS4 Minimum Control Measure #3 – IDDE: *E. coli* Concentrations Trend Map



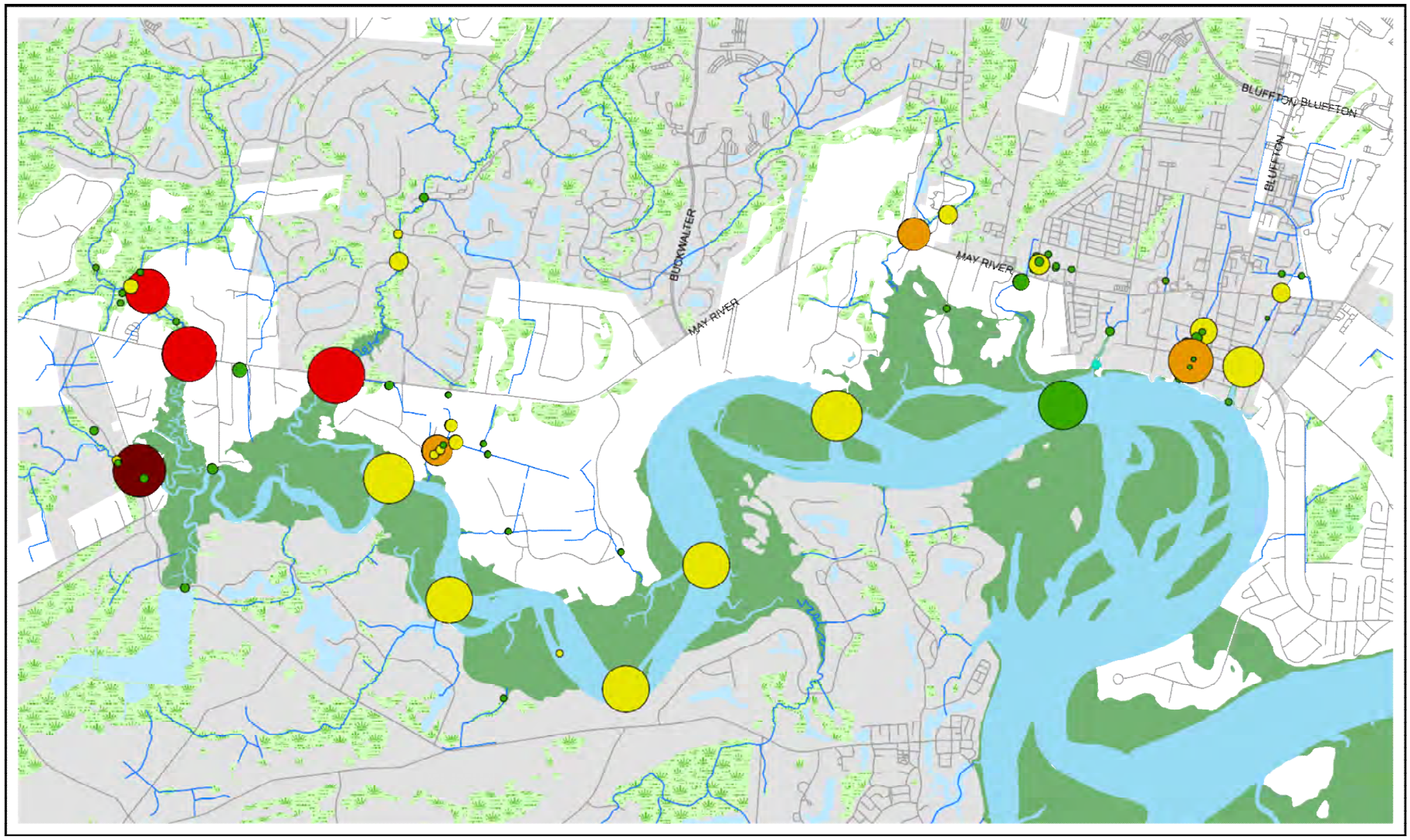
E coliform geomeans updated as of: 1/19/2021

	USCB Water Quality Samples	Microbial Source Tracking Samples	MS4 Quarterly Samples Collected
FY 2021 YTD Totals	277	70	95
FY 2020 Totals	223	115	123
FY 2019 Totals	280	193	264
FY 2018 Totals	216	217	224

- MST program began November 2016; MS4 Quarterly Sampling initiated 2/2017
- Totals include only samples submitted for laboratory analysis, and not *in situ* parameters.

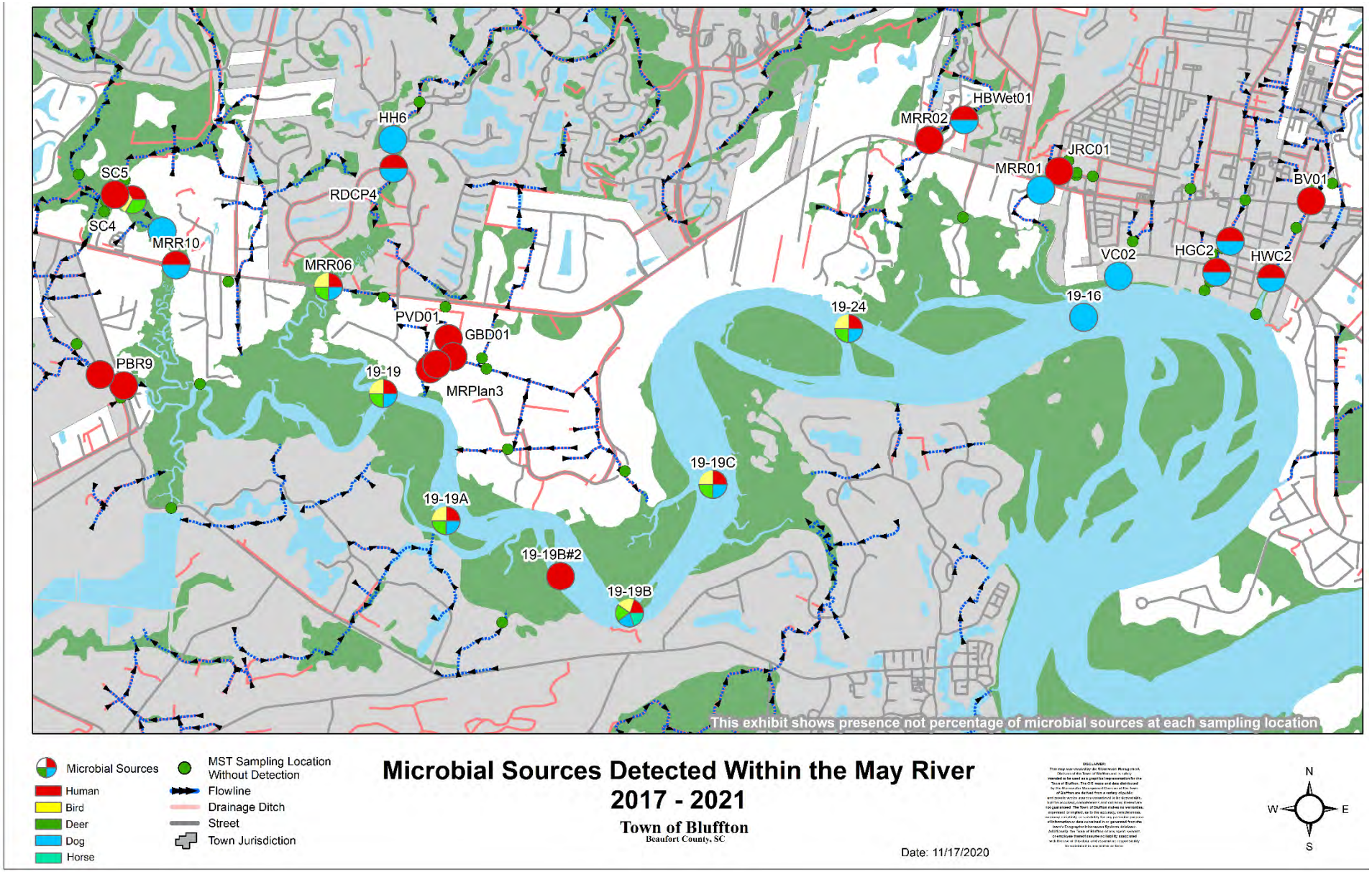
ATTACHMENT 4c

MS4 Minimum Control Measure #3 – IDDE: Microbial Source Tracking (MST) Trend Map – Human Source



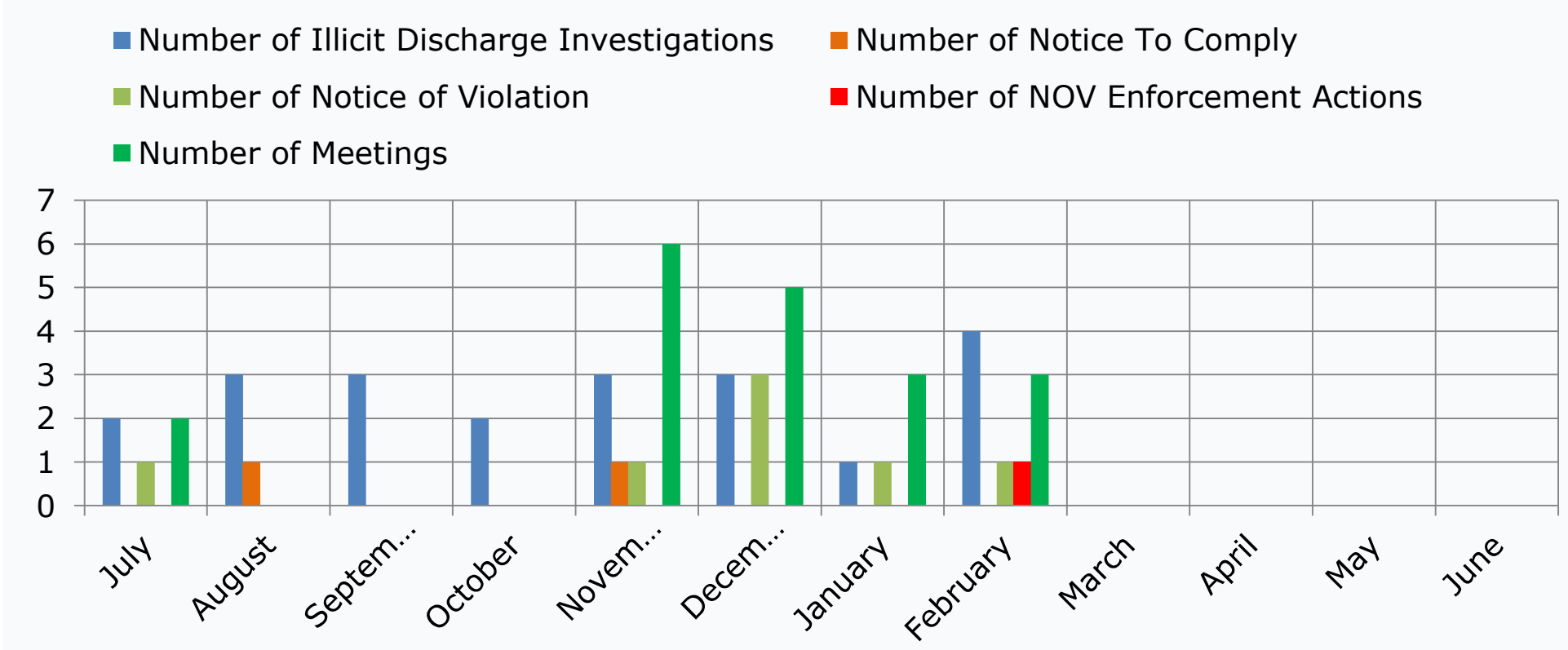
ATTACHMENT 4d

MS4 Minimum Control Measure #3 – IDDE: Microbial Source Tracking (MST) Map – All Sources



ATTACHMENT 4e

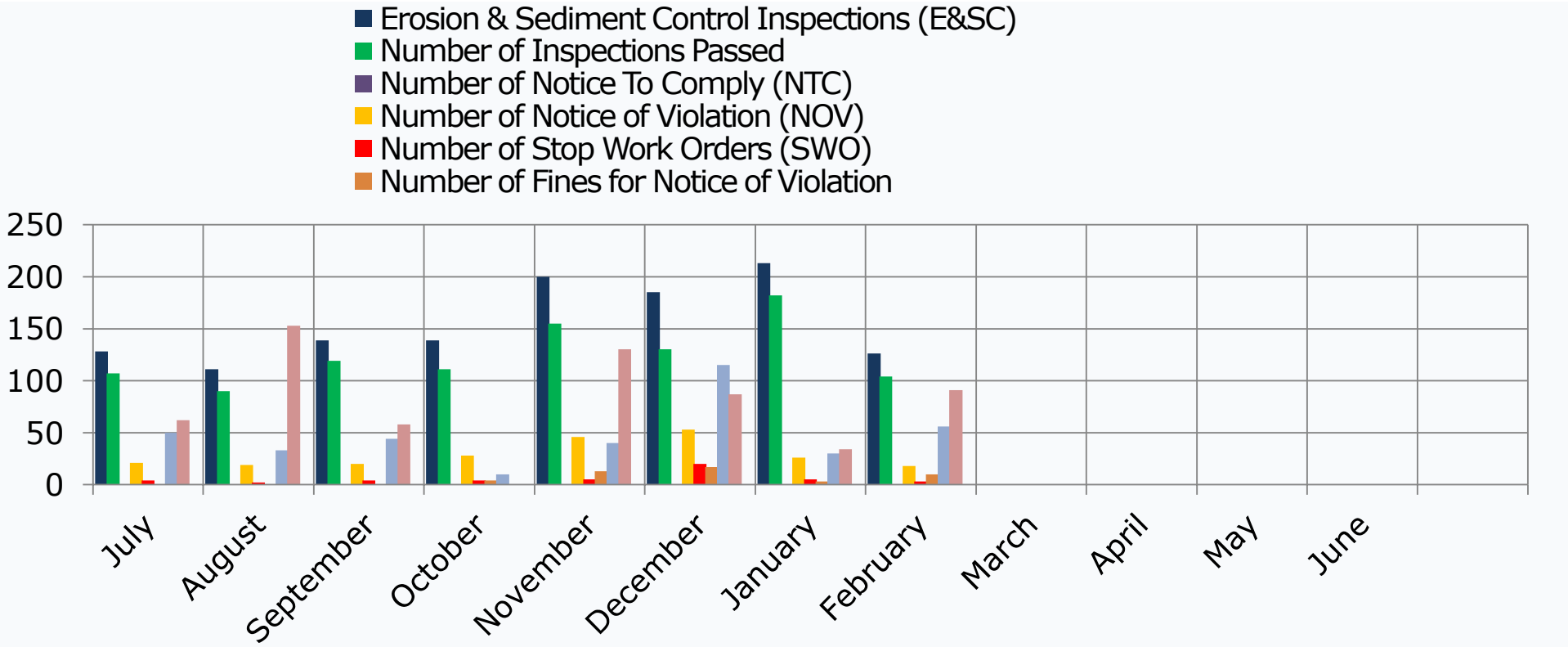
MS4 Minimum Control Measure #3 – IDDE: Illicit Discharge Investigations



	Number of Illicit Discharge Investigations	Number of Notices To Comply Issued	Number of Notices of Violation Issued	Number of NOV Enforcement Actions	Number of Meetings
FY 2021 YTD Totals	21	2	7	1	19
FY 2020 Totals	45	10	8	6	49
FY 2019 Totals	38	20	3	1	61
FY 2018 Totals	48	20	4	2	60

ATTACHMENT 5

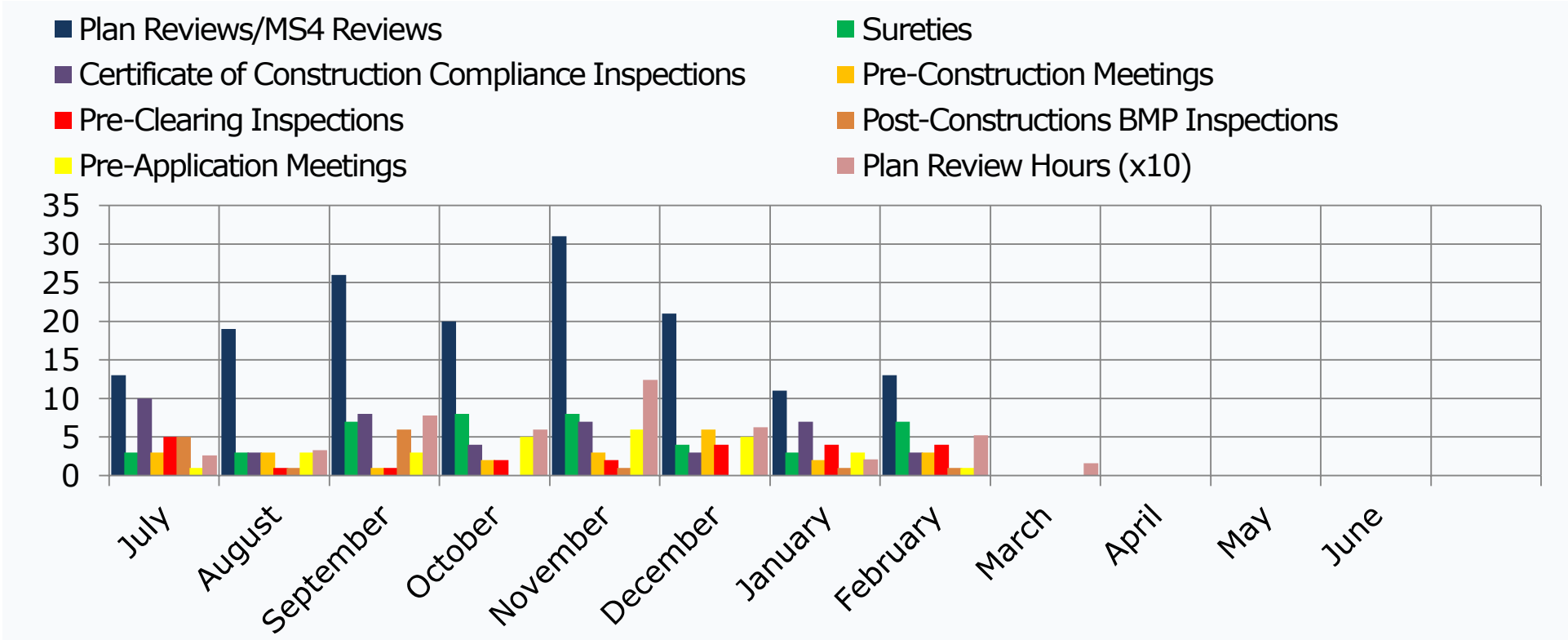
MS4 Minimum Control Measure #4 - Construction Site Stormwater Runoff Control



	Number of Sediment & Erosion Control Inspections	Number of Inspections Passed	Number of NTC Issued	Number of NOVs Issued	Number of SWO Issued	Number of NOV Enforcement Actions	Number of E&SC Meetings
FY 2021 YTD Totals	1224	1016	N/A	197	28	30	304
FY 2020 Totals	1,517	1187	128	185	16	9	496
FY 2019 Totals	1,688	1,384	254	72	N/A	7	403

ATTACHMENT 6

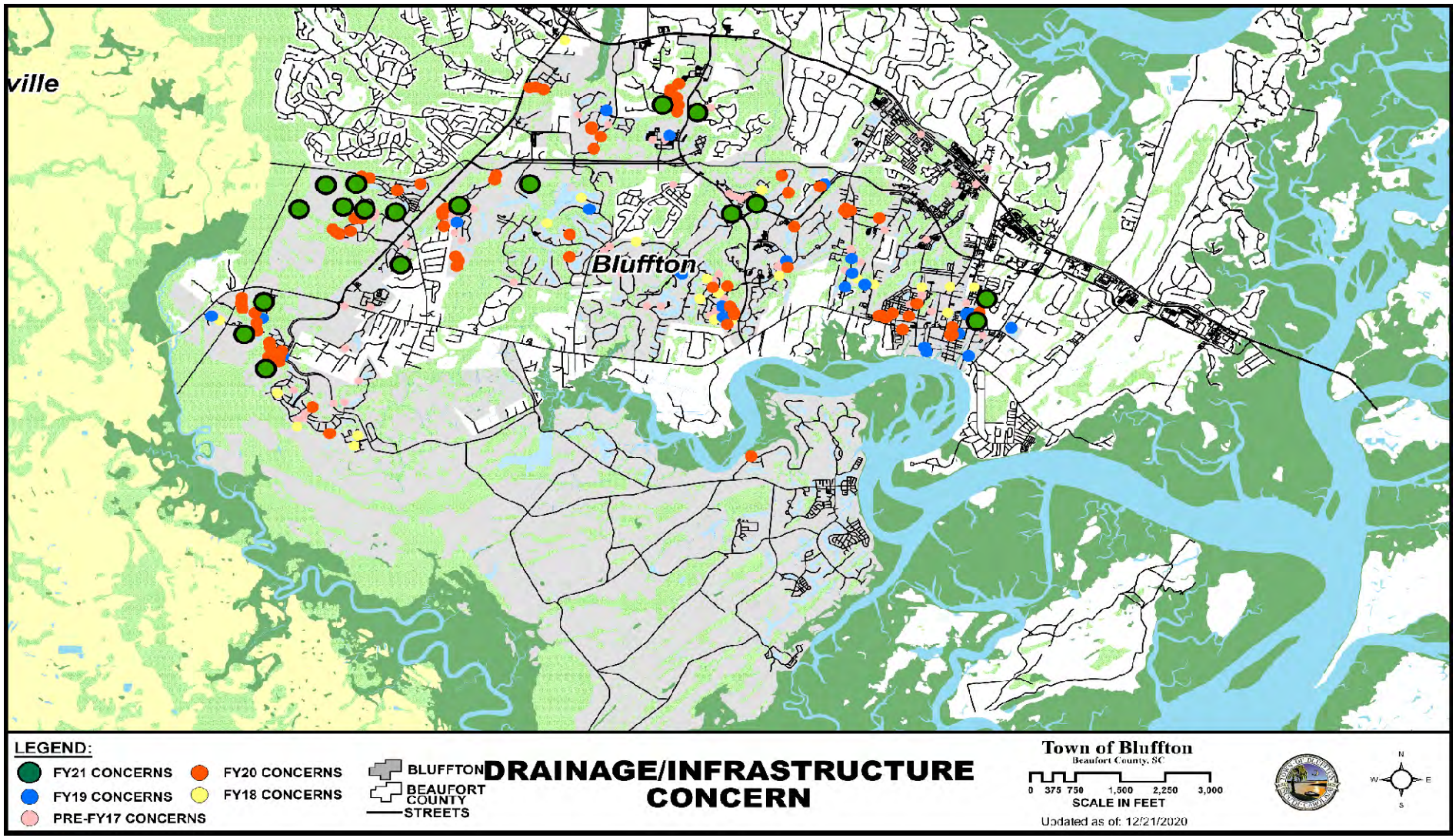
MS4 Minimum Control Measure #5
Stormwater Plan Review & Related Activity



	Plan Reviews MS4 Reviews	Sureties	Certificate of Construction Compliance Inspections	Pre-Construction Meetings	Pre-Clearing Inspections	Post Construction BMP Inspections	Pre-Application Meetings	Total Plan Review Hours
FY 2021 YTD Totals	120	32	39	13	15	14	21	410 Hrs.
FY 2020 Totals	176	53	46	36	17	8	36	789 Hrs.
FY 2019 Totals	208	52	53	47	37	27	63	1,040 Hrs.

ATTACHMENT 7

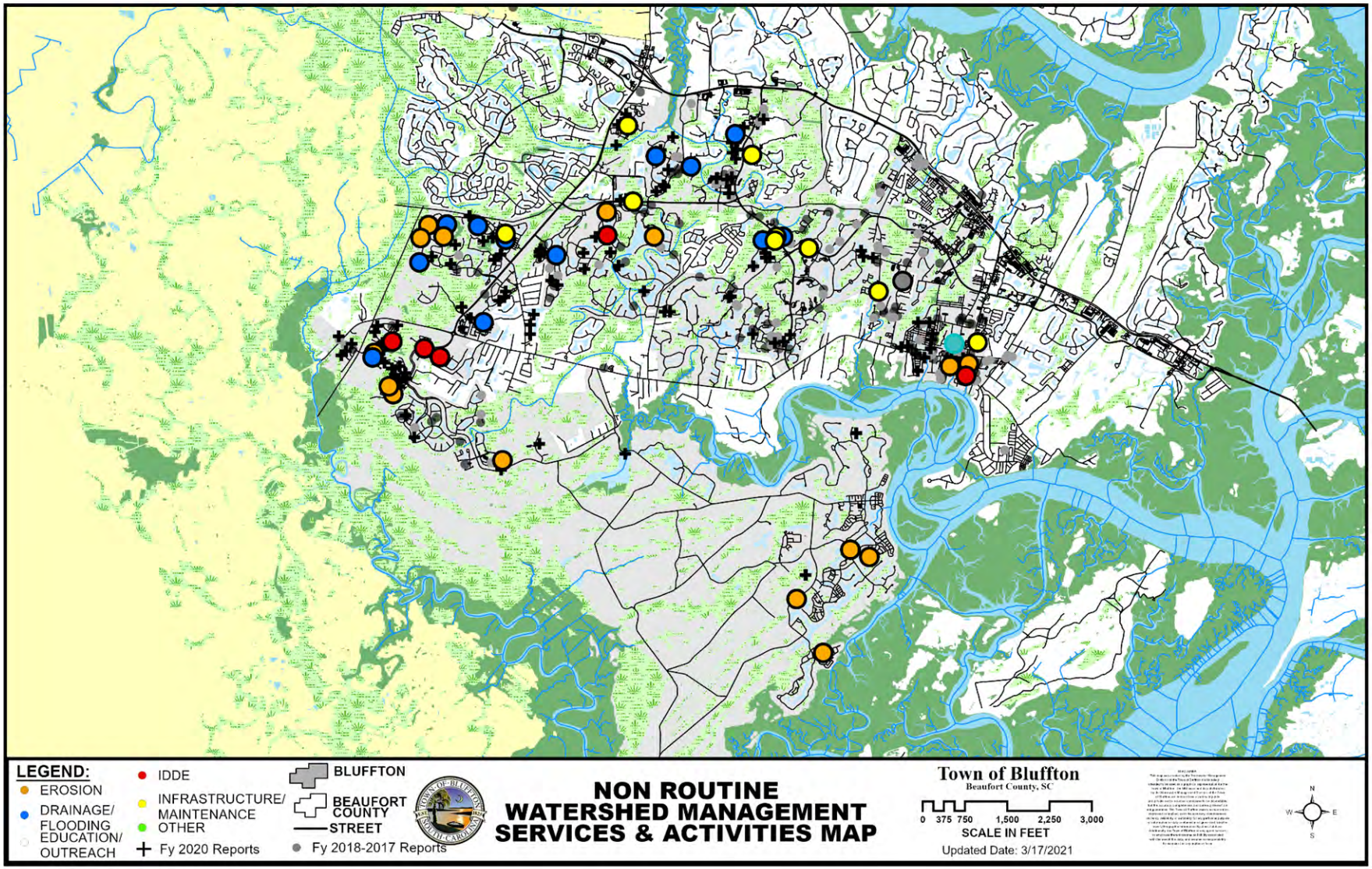
Citizen Drainage, Maintenance and Inspections Concerns Map



	Number of Drainage Concerns Investigated	Number of Meetings
FY 2021 YTD Totals	27	28
FY 2020 Totals	68	76
FY 2019 Totals	54	59

ATTACHMENT 8

Citizen Request for Watershed Mngt. Services & Activities Map



	Number of Citizen Requests Investigated	Number of Meetings
FY 2021 YTD Totals	31	30
FY 2020 Totals	99	102
FY 2019 Totals	75	79

PUBLIC NOTICE

The Beautification Committee (BC)
Meeting scheduled for

Thursday, March 18, 2021, at 10:00 a.m.

Has been CANCELED
due to lack of a Quorum

The next meeting is scheduled for
Thursday, April 15, 2021

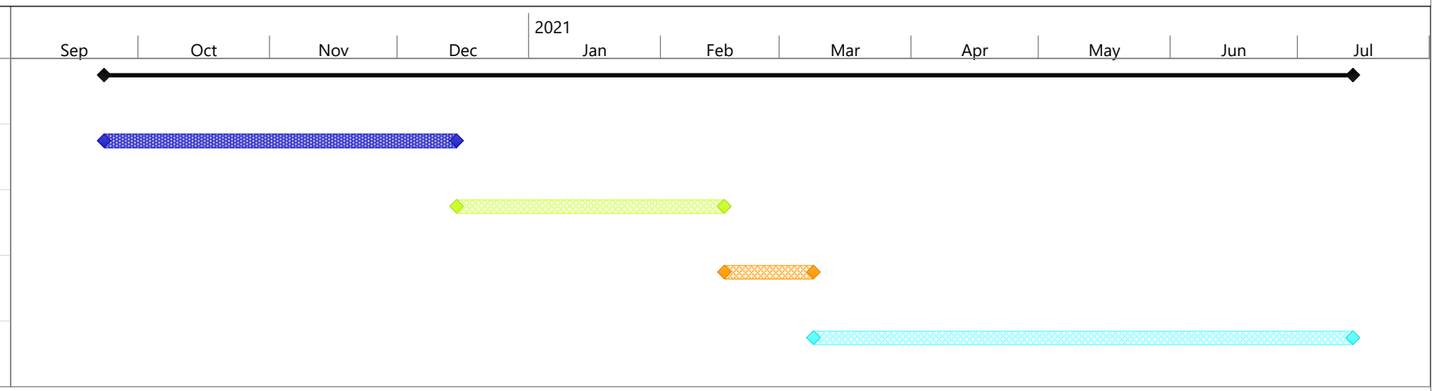
If you have questions, please contact
Engineering at: 843-706-4599

Public Works Activities Report

Week	# of Activities	Labor Cost	Equipment Cost	Other Cost	Total
FY21WK1	61	$4,397.00	$3,188.00		**$7,584.00**
FY21WK2	56	$5,474.00	$3,574.00	$121.00	**$9,168.00**
FY21WK3	48	$4,880.00	$3,502.00		**$8,382.00**
FY21WK4	62	$5,828.00	$3,970.00		**$9,799.00**
FY21WK5	45	$4,706.00	$3,575.00		**$8,281.00**
FY21WK6	54	$5,645.00	$3,114.00		**$9,126.00**
FY21WK7	60	$4,855.00	$4,232.00		**$9,087.00**
FY21WK8	67	$5,118.00	$4,221.00		**$9,339.00**
FY21WK9	50	$5,784.00	$3,923.00		**$9,707.00**
FY21WK10	54	$6,131.00	$4,248.00	$21.00	**$10,400.00**
FY21WK11	41	$4,677.00	$2,740.00		**$7,417.00**
FY21WK12	70	$5,580.00	$2,587.00	$326.00	**$8,494.00**
FY21WK13	94	$5,864.00	$5,084.00		**$10,949.00**
FY21WK14	49	$6,171.00	$4,261.00		**$10,431.00**
FY21WK15	53	$5,870.00	$4,059.00		**$9,929.00**
FY21WK16	62	$5,239.00	$3,531.00		**$8,771.00**
FY21WK17	77	$4,660.00	$3,769.00	$364.00	**$8,792.00**
FY21WK18	45	$4,679.00	$3,417.00		**$8,096.00**
FY21WK19	62	$6,186.00	$7,048.00		**$13,234.00**
FY21WK20	41	$4,135.00	$2,633.00		**$6,768.00**
FY21WK21	51	$5,446.00	$3,073.00		**$8,519.00**
FY21WK22	39	$3,229.00	$3,599.00		**$6,828.00**
FY21WK23	51	$5,072.00	$3,014.00		**$8,085.00**
FY21WK24	76	$6,073.00	$5,257.00		**$11,329.00**
FY21WK25	56	$4,245.00	$2,976.00		**$7,221.00**
FY21WK26	38	$1,890.00	$1,936.00		**$3,826.00**
FY21WK27	50	$4,417.00	$4,060.00		**$8,477.00**
FY21WK28	69	$5,753.00	$4,185.00		**$9,938.00**
FY21WK29	36	$4,703.00	$6,365.00		**$11,069.00**
FY21WK30	69	$5,100.00	$4,540.00		**$9,640.00**
FY21WK31	62	$5,581.00	$3,627.00		**$9,208.00**
FY21WK32	89	$5,648.00	$3,808.00		**$9,456.00**
FY21WK33	67	$4,845.00	$3,486.00		**$8,331.00**
FY21WK34	77	$6,031.00	$3,791.00		**$9,823.00**
FY21WK35	43	$4,417.00	$2,184.00		**$6,601.00**
FY21WK36	92	$5,213.00	$2,690.00		**$7,903.00**
FY21WK37	96	$5,195.00	$3,497.00		**$8,692.00**
FY21WK38	65	$4,150.00	$2,500.00		**$6,729.00**
FY21WK39					
FY21WK40					
FY21WK41					
FY21WK42					
FY21WK43					
FY21WK44					
FY21WK45					
FY21WK46					
FY21WK47					
FY21WK48					
FY21WK49					
FY21WK50					
FY21WK51					
FY21WK52					
Total	**2277**	**$192,887.00**	**$141,264.00**	**$832.00**	**$335,429.00**

BUCKWALTER PLACE PARK RESTROOMS
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Buckwalter Place Park Restrooms**	**210 days**	**Wed 9/23/20**	**Tue 7/13/21**
2	**Planning and Conceptual Design**	**59 days**	**Wed 9/23/20**	**Mon 12/14/20**
7	**Final Design and Construction Documents**	**45 days**	**Tue 12/15/20**	**Mon 2/15/21**
10	**Permitting**	**15 days**	**Tue 2/16/21**	**Mon 3/8/21**
13	**Bidding and Contracts**	**91 days**	**Tue 3/9/21**	**Tue 7/13/21**

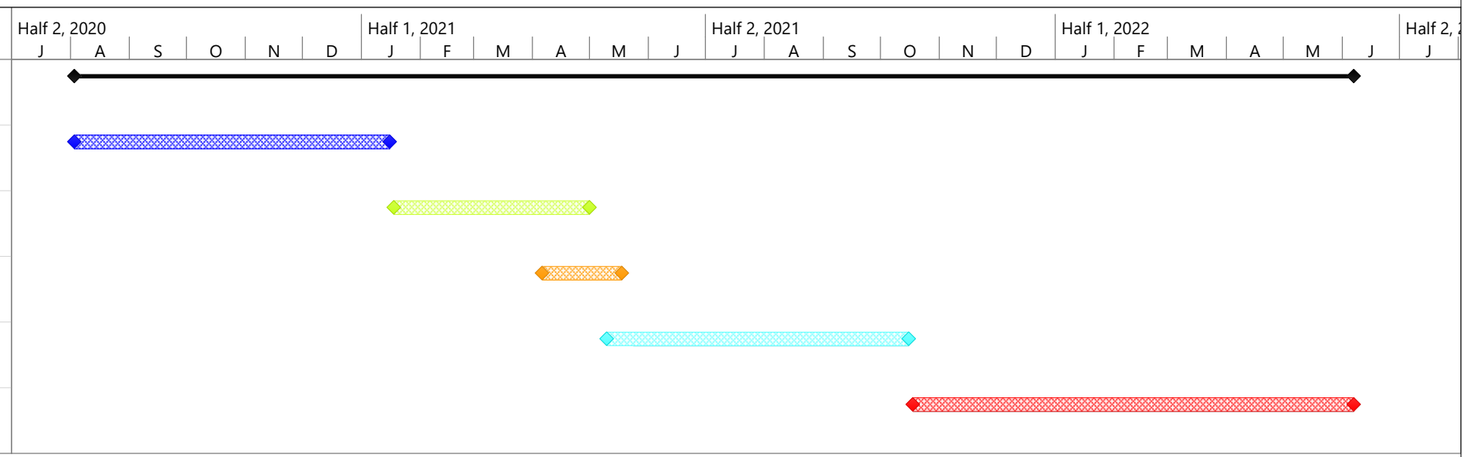


Project: 00040
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BUCKWALTER MULTI-COUNTY COMMERCE PARK
PHASE II DEVELOPMENT PARCEL - PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE II DEVELOPMENT PARCEL**	**481 days**	**Mon 8/3/20**	**Mon 6/6/22**
2	**Planning and Conceptual Design**	**120 days**	**Mon 8/3/20**	**Fri 1/15/21**
9	**Final Design and Construction Documents**	**75 days**	**Mon 1/18/21**	**Fri 4/30/21**
16	**Permitting**	**30 days**	**Tue 4/6/21**	**Mon 5/17/21**
21	**Bidding and Contracts**	**115 days**	**Mon 5/10/21**	**Fri 10/15/21**
32	**Construction**	**166 days**	**Mon 10/18/21**	**Mon 6/6/22**

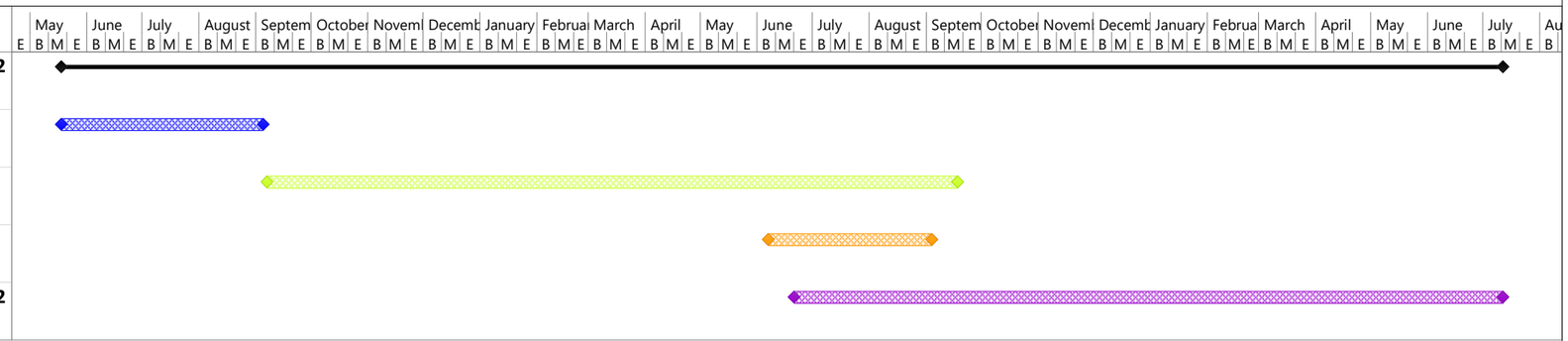


Project: 00040
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

CALHOUN STREET STREETSCAPE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**CALHOUN STREET STREETSCAPE**	**561 days**	**Mon 5/18/20**	**Mon 7/11/22**
2	**Planning and Conceptual Design**	**80 days**	**Mon 5/18/20**	**Fri 9/4/20**
7	**Final Planning and Construction Documents**	**270 days**	**Mon 9/7/20**	**Fri 9/17/21**
27	**Permitting Phase**	**65 days**	**Mon 6/7/21**	**Fri 9/3/21**
32	**Easements and Land Acquisition**	**276 days**	**Mon 6/21/21**	**Mon 7/11/22**

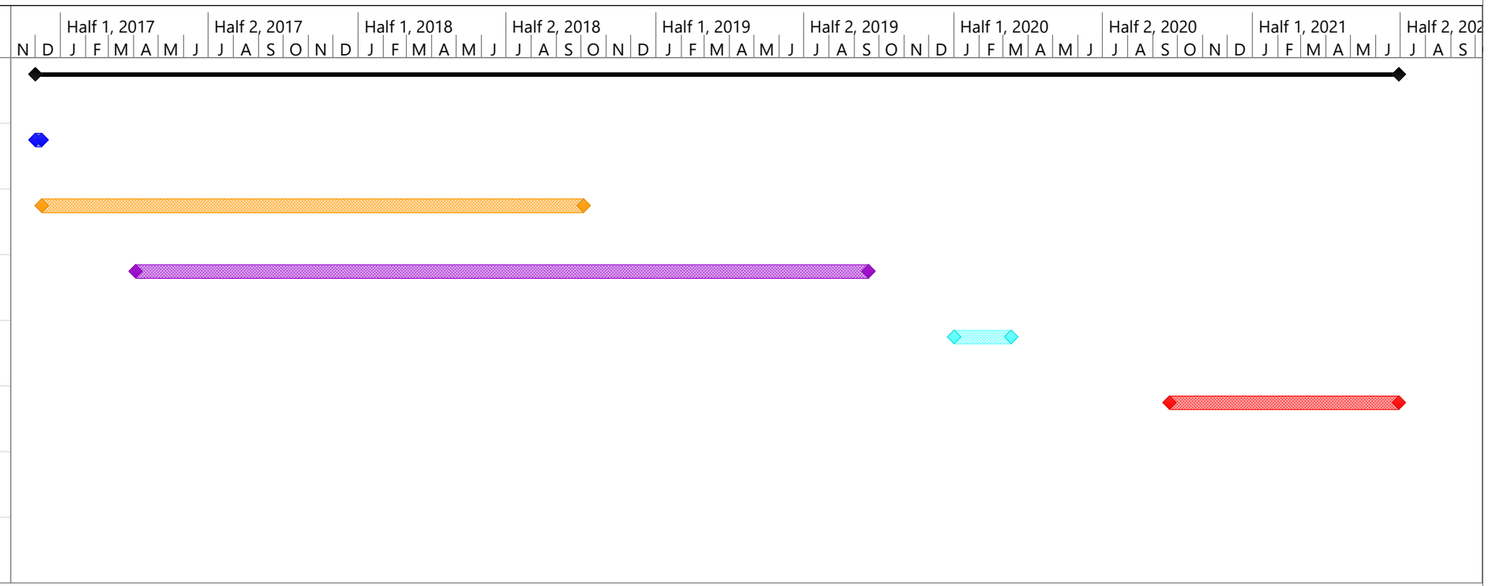


Project: 00042
Date: Wed 1/27/21

Milestone ◆ Task
Critical Task ★ Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction

BUCK ISLAND-SIMMONSVILLE SANITARY SEWER PHASE 5 A-D
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 5 A-D**	**1193 days?**	**Thu 12/1/16**	**Mon 6/28/21**
2	**Planning and Conceptual Design**	**6 days**	**Thu 12/1/16**	**Thu 12/8/16**
4	**Permitting**	**474 days**	**Fri 12/9/16**	**Wed 10/3/18**
11	**Easements and Land Acquisition**	**642 days**	**Mon 4/3/17**	**Tue 9/17/19**
16	**Bidding and Contracts**	**50 days**	**Wed 1/1/20**	**Tue 3/10/20**
21	**Construction**	**201 days**	**Mon 9/21/20**	**Mon 6/28/21**
29				
30				

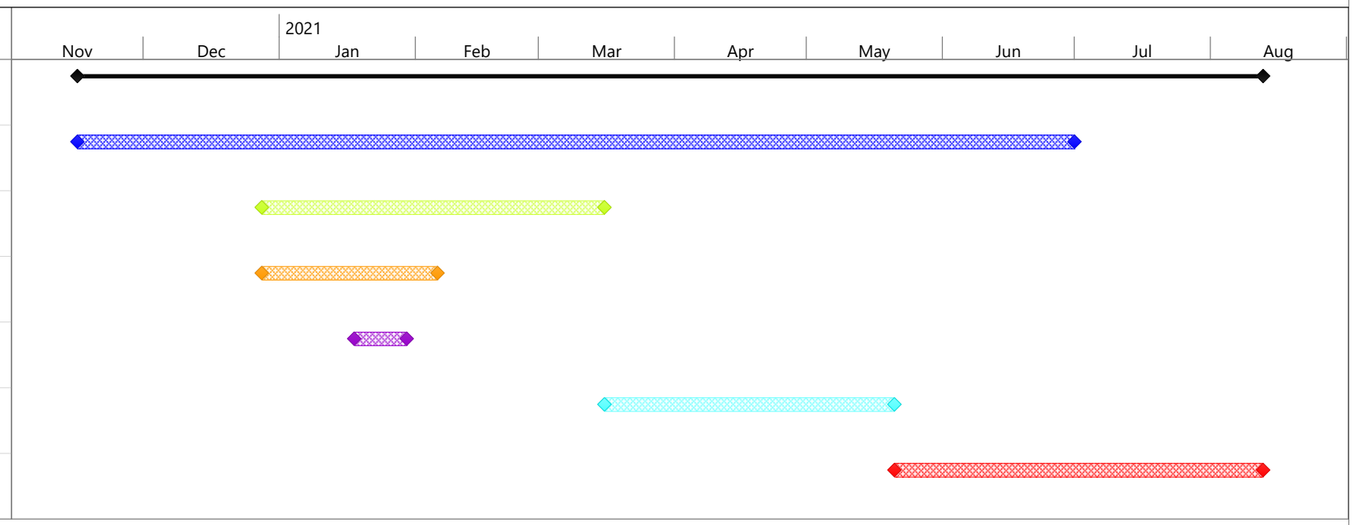


Project: 00044
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction

HISTORIC DISTRICT STREETSCAPE AND DRAINAGE IMPROVEMENTS PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Traffic Calming Study and AME Church Rain Garden**	**194 days**	**Mon 11/16/20**	**Thu 8/12/21**
2	**Planning and Conceptual Design**	**163 days**	**Mon 11/16/20**	**Wed 6/30/21**
7	**Final Design and Construction Documents**	**56 days**	**Mon 12/28/20**	**Mon 3/15/21**
10	**Permitting**	**30 days**	**Mon 12/28/20**	**Fri 2/5/21**
14	**Easements and Land Acquisition**	**10 days**	**Mon 1/18/21**	**Fri 1/29/21**
17	**Bidding and Contracts**	**48 days**	**Tue 3/16/21**	**Thu 5/20/21**
22	**Construction**	**60 days**	**Fri 5/21/21**	**Thu 8/12/21**

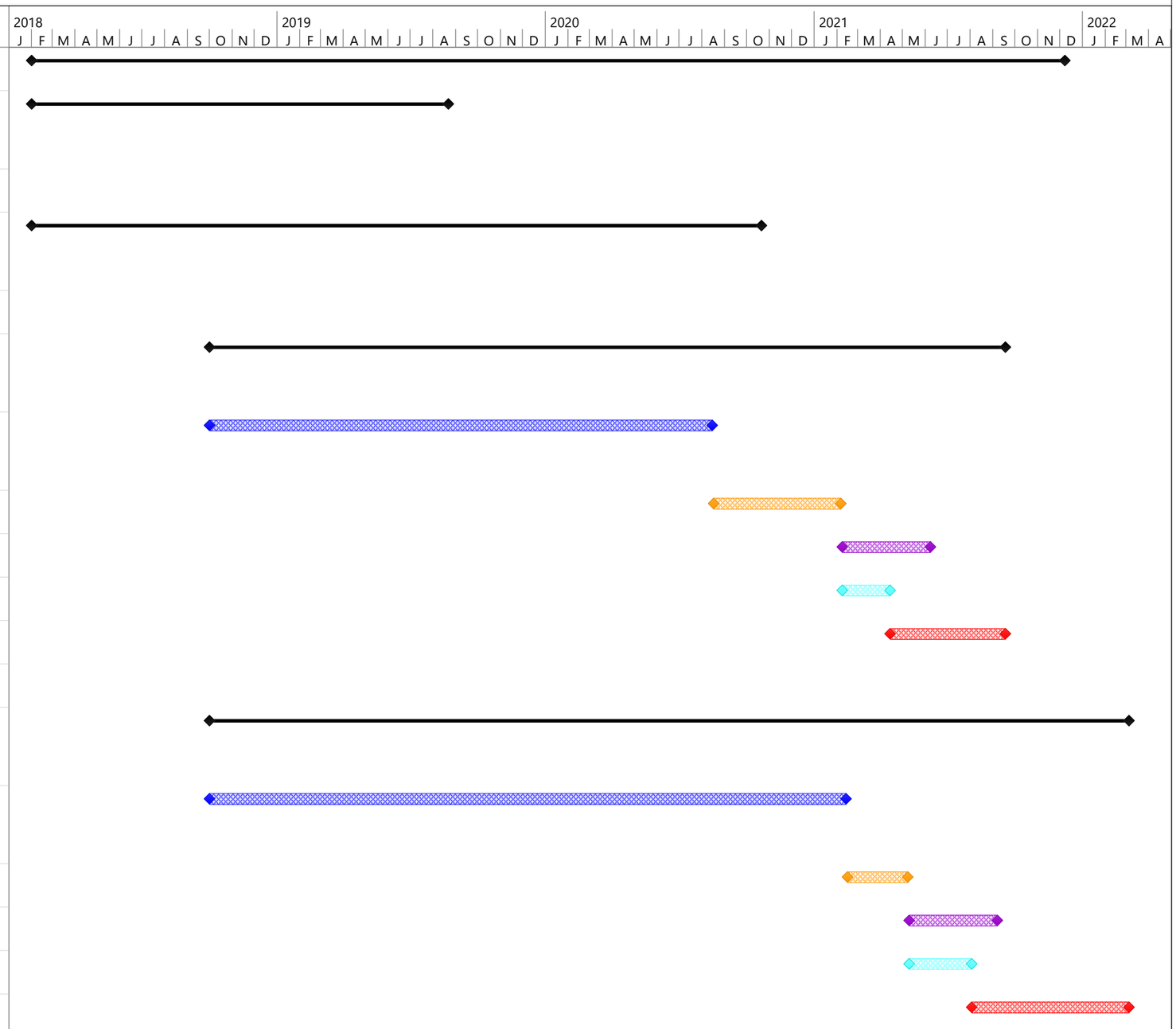


Project: 00050
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BUCK ISLAND-SIMMONSVILLE NEIGHBORHOOD SIDEWALKS
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**SIDEWALKS AND LIGHTING**	1004 days	Thu 2/1/18	Tue 12/7/21
2	**Sidewalk from Jennifer Ct to Simmonsville Rd**	**405 days**	**Thu 2/1/18**	**Wed 8/21/19**
26				
27	**Sidewalk from Kitty Road to 301 Buck Island Rd**	**709 days**	**Thu 2/1/18**	**Tue 10/20/20**
53				
54	**Sidewalk from Grayco to Sugaree (Simmonsville Rd)**	**775 days**	**Mon 10/1/18**	**Fri 9/17/21**
55	**Final Design and Construction Documents**	**490 days**	**Mon 10/1/18**	**Fri 8/14/20**
61	**Permitting**	**125 days**	**Mon 8/17/20**	**Fri 2/5/21**
63	**Easements**	**86 days**	**Mon 2/8/21**	**Mon 6/7/21**
68	**Bidding/Contract**	**47 days**	**Mon 2/8/21**	**Tue 4/13/21**
73	**Construction**	**113 days**	**Wed 4/14/21**	**Fri 9/17/21**
80				
81	**Sidewalk from Sugaree to Windy Lake (Simmonsville Rd)**	**895 days**	**Mon 10/1/18**	**Fri 3/4/22**
82	**Final Design and Construction Documents**	**620 days**	**Mon 10/1/18**	**Fri 2/12/21**
88	**Permitting**	**60 days**	**Mon 2/15/21**	**Fri 5/7/21**
90	**Easements**	**86 days**	**Mon 5/10/21**	**Mon 9/6/21**
95	**Bidding/Contract**	**61 days**	**Mon 5/10/21**	**Mon 8/2/21**
100	**Construction**	**154 days**	**Tue 8/3/21**	**Fri 3/4/22**

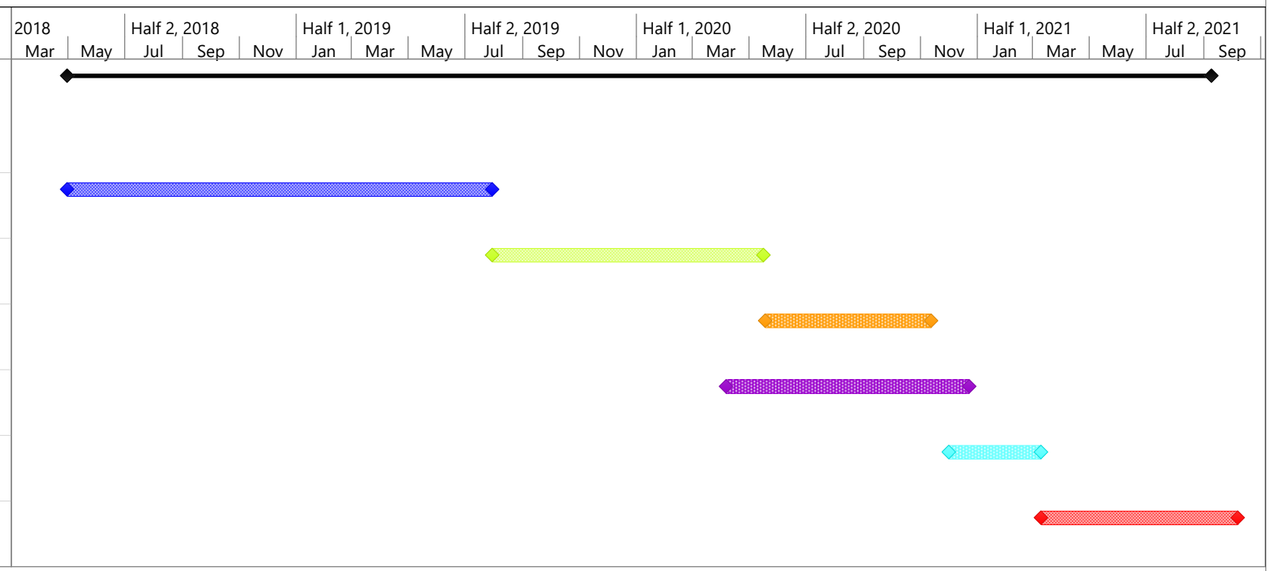


Project: 00054
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction

GOETHE-SHULTS NEIGHBORHOOD IMPROVEMENTS PHASE 2
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**GOETHE/SHULTS NEIGHBORHOOD IMPROVEMENTS PHASE 2**	**878 days**	**Mon 4/30/18**	**Wed 9/8/21**
2	**PLANNING AND CONCEPTUAL DESIGN**	**326 days**	**Mon 4/30/18**	**Mon 7/29/19**
12	**FINAL DESIGN AND CONSTRUCTION DOCUMENTS**	**209 days**	**Tue 7/30/19**	**Fri 5/15/20**
21	**PERMITTING**	**128 days**	**Mon 5/18/20**	**Wed 11/11/20**
25	**EASEMENTS AND LAND ACQUISITION**	**187 days**	**Mon 4/6/20**	**Tue 12/22/20**
32	**BIDDING AND CONTRACTS**	**71 days**	**Tue 12/1/20**	**Tue 3/9/21**
37	**CONSTRUCTION**	**151 days**	**Wed 3/10/21**	**Wed 10/6/21**

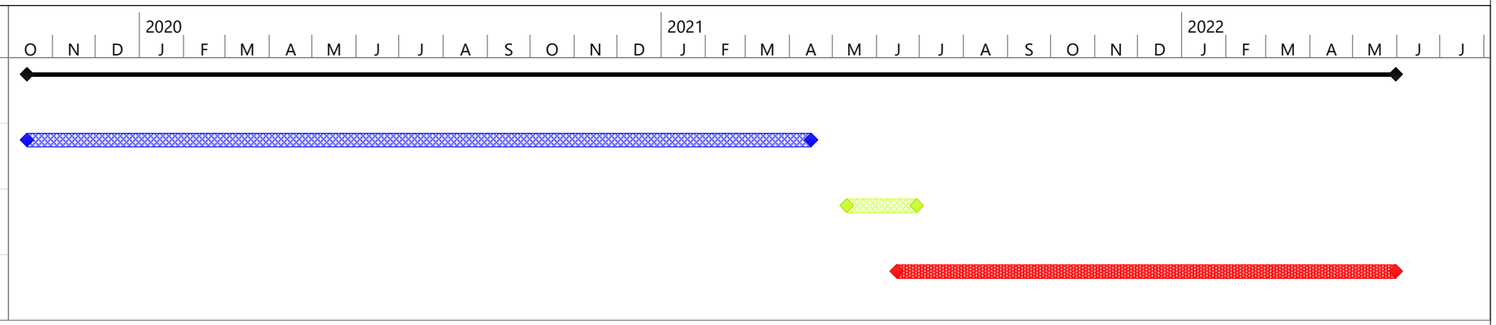


Project: 00055
Date: Tue 1/5/21

Miletstone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

OYSTER FACTORY PARK
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Oyster Factory Park**	**686 days**	**Mon 10/14/19**	**Mon 5/30/22**
2	**Planning and Conceptual Design**	**394 days**	**Mon 10/14/19**	**Thu 4/15/21**
11	**Easement and Land Acquisition**	**35 days**	**Tue 5/11/21**	**Mon 6/28/21**
13	**Construction**	**250 days**	**Tue 6/15/21**	**Mon 5/30/22**

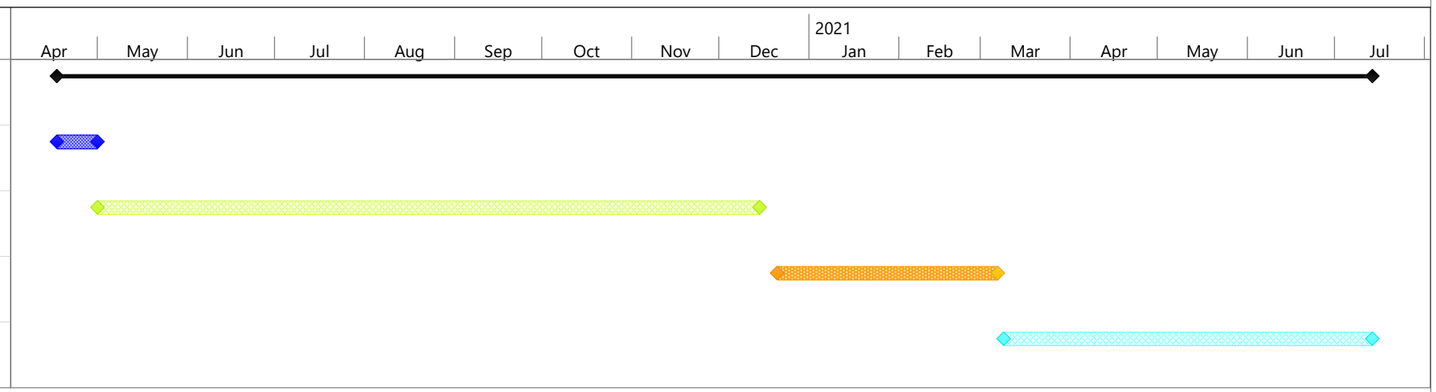


Project: 00059
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

SQUIRE POPE CARRIAGE HOSUE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Squire Pope Carriage House**	**323 days**	**Fri 4/17/20**	**Tue 7/13/21**
2	**Planning and Conceptual Design**	**10 days**	**Fri 4/17/20**	**Thu 4/30/20**
5	**Final Design and Construction Documents**	**162 days**	**Fri 5/1/20**	**Mon 12/14/20**
10	**Permitting**	**55 days**	**Mon 12/21/20**	**Sun 3/7/21**
13	**Bidding and Contracts**	**91 days**	**Tue 3/9/21**	**Tue 7/13/21**

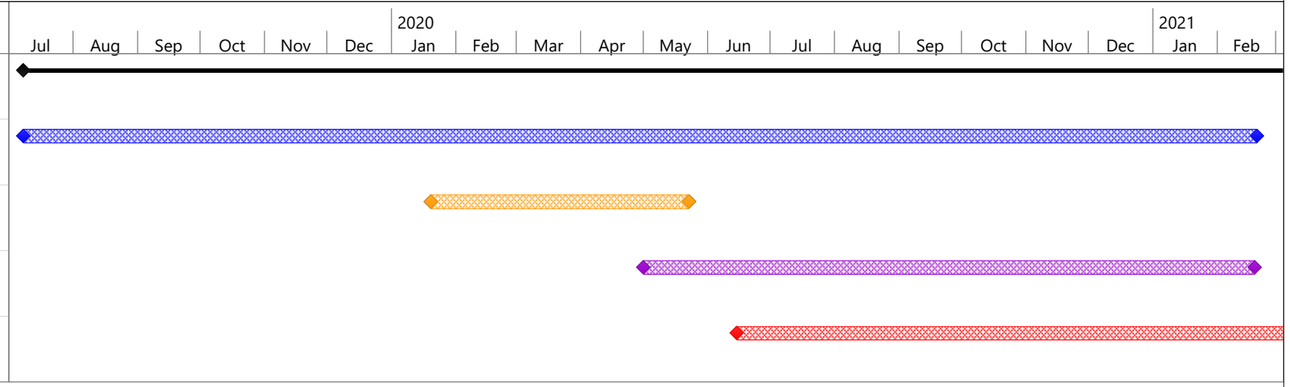


Project: 00067
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BOUNDARY STREET LIGHTING
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**BOUNDARY STREET LIGHTING PHASE 2**	**451 days**	**Mon 7/8/19**	**Mon 3/29/21**
2	**Planning and Conceptual Design**	**425 days**	**Mon 7/8/19**	**Fri 2/19/21**
13	**Permitting**	**90 days**	**Mon 1/20/20**	**Fri 5/22/20**
15	**Easements and Land Acquisition**	**210 days**	**Fri 5/1/20**	**Thu 2/18/21**
18	**Construction**	**206 days**	**Mon 6/15/20**	**Mon 3/29/21**

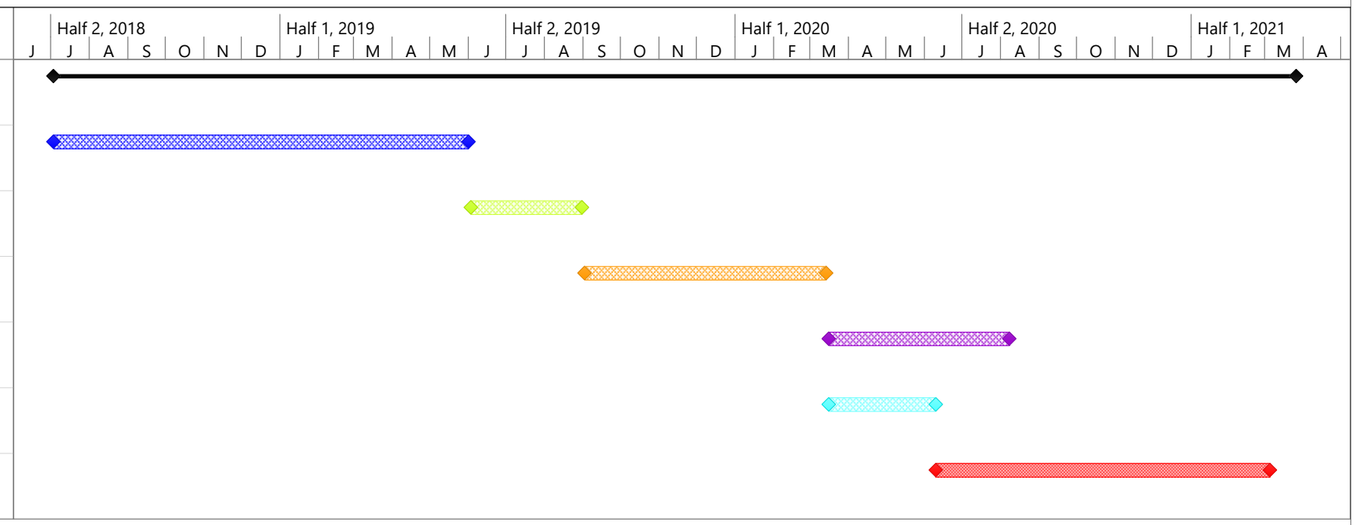


Project: 00069
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contract
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 1
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 1**	**713 days**	**Tue 7/3/18**	**Thu 3/25/21**
2	**Planning and Conceptual Design**	**239 days**	**Tue 7/3/18**	**Fri 5/31/19**
9	**Final Design and Construction Documents**	**65 days**	**Mon 6/3/19**	**Fri 8/30/19**
11	**Permitting**	**140 days**	**Mon 9/2/19**	**Fri 3/13/20**
14	**Easements and Land Acquisition**	**105 days**	**Mon 3/16/20**	**Fri 8/7/20**
17	**Bidding and Contracts**	**62 days**	**Mon 3/16/20**	**Tue 6/9/20**
22	**Construction**	**192 days**	**Wed 6/10/20**	**Thu 3/4/21**

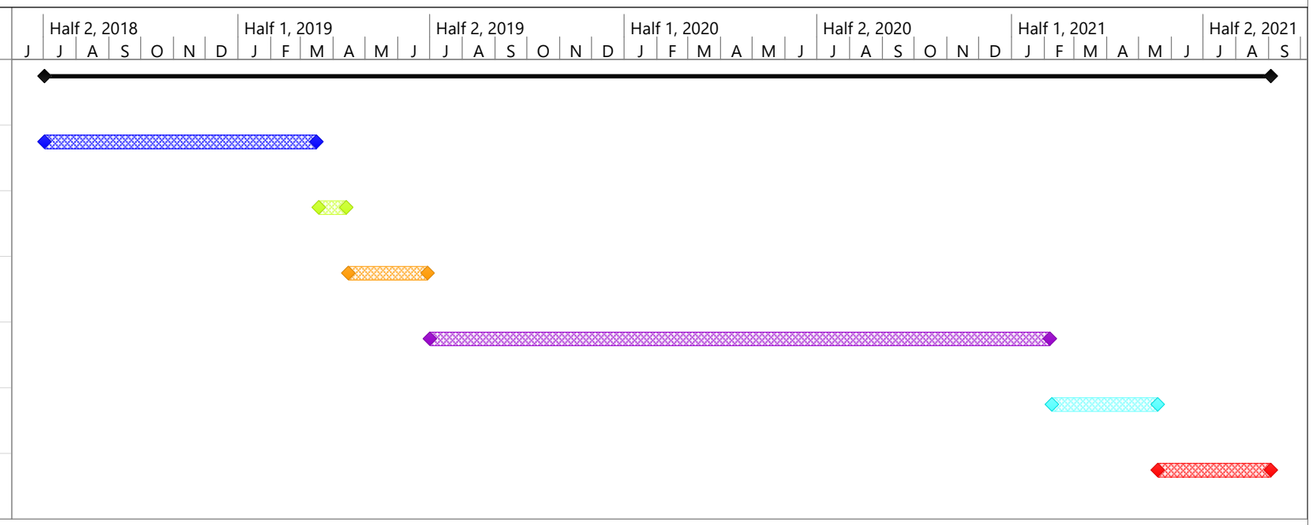


Project: 00070
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 2
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 2**	**829 days**	**Mon 7/2/18**	**Thu 9/2/21**
2	**Planning and Conceptual Design**	**185 days**	**Mon 7/2/18**	**Fri 3/15/19**
10	**Final Design and Construction Documents**	**20 days**	**Mon 3/18/19**	**Fri 4/12/19**
12	**Permitting**	**55 days**	**Mon 4/15/19**	**Fri 6/28/19**
15	**Easements and Land Acquisition**	**420 days**	**Mon 7/1/19**	**Fri 2/5/21**
17	**Bidding and Contracts**	**72 days**	**Mon 2/8/21**	**Tue 5/18/21**
22	**Construction**	**77 days**	**Wed 5/19/21**	**Thu 9/2/21**

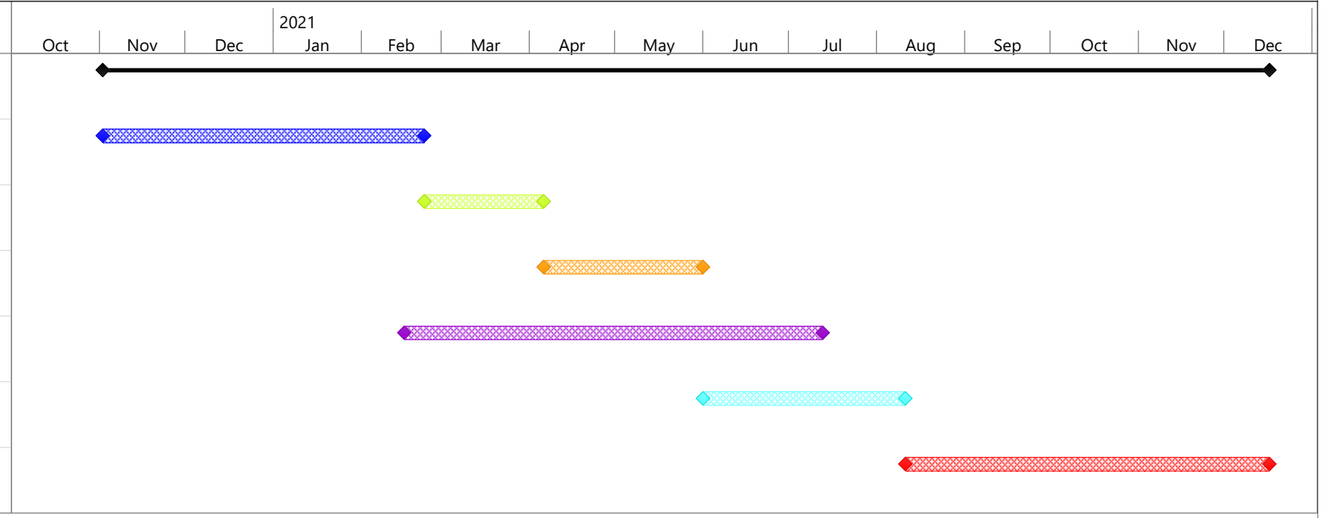


Project: 00071
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 3
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 3**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

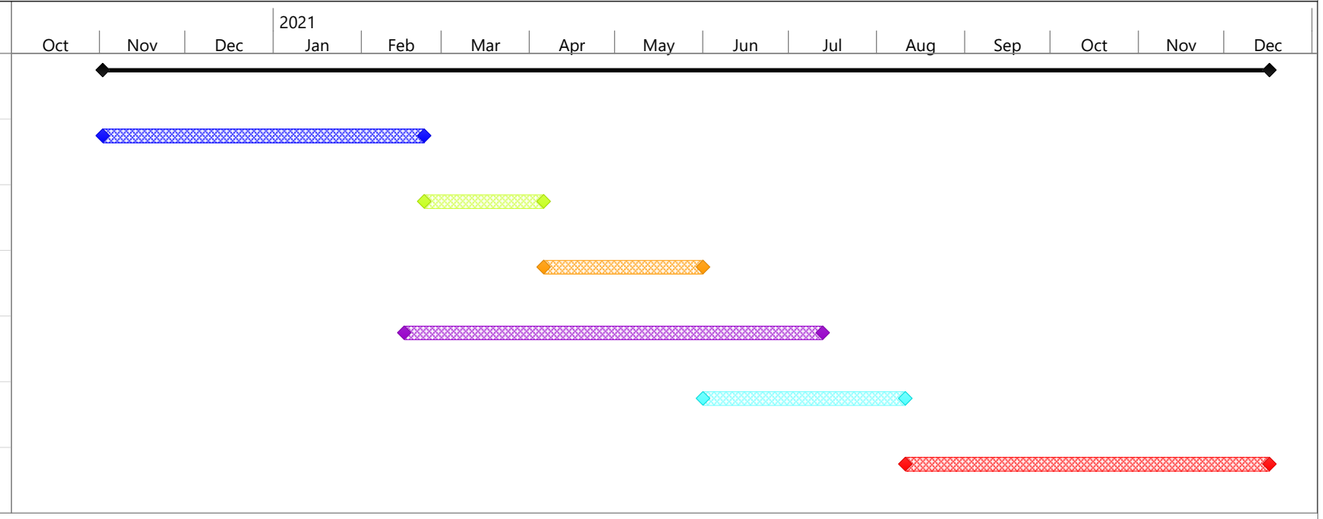


Project: 00072
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 4
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 4**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

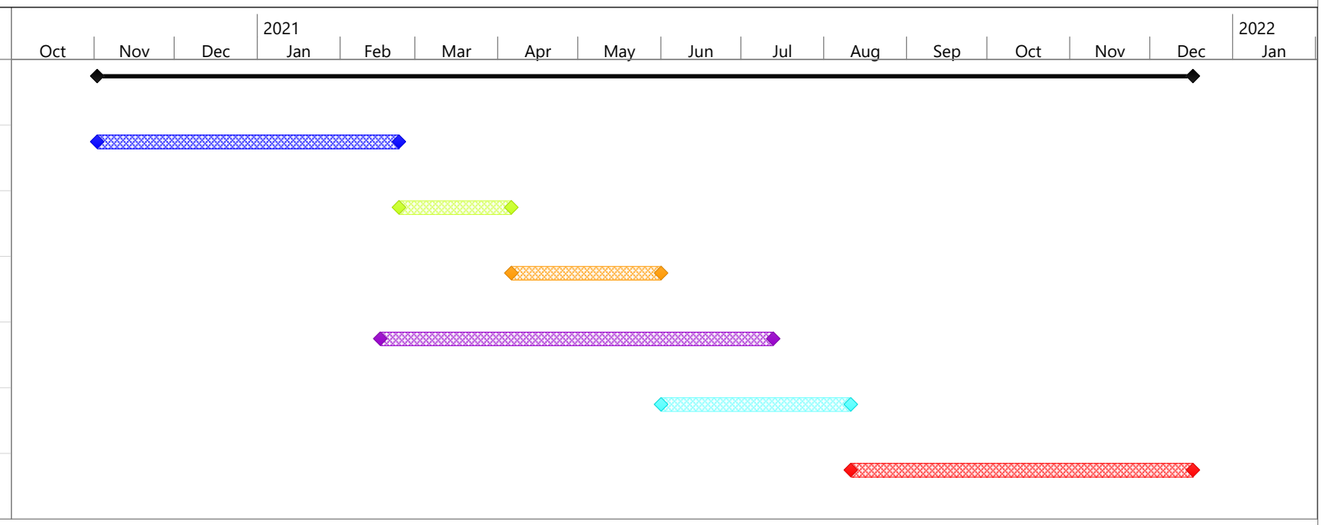


Project: 00073
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 5
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 5**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

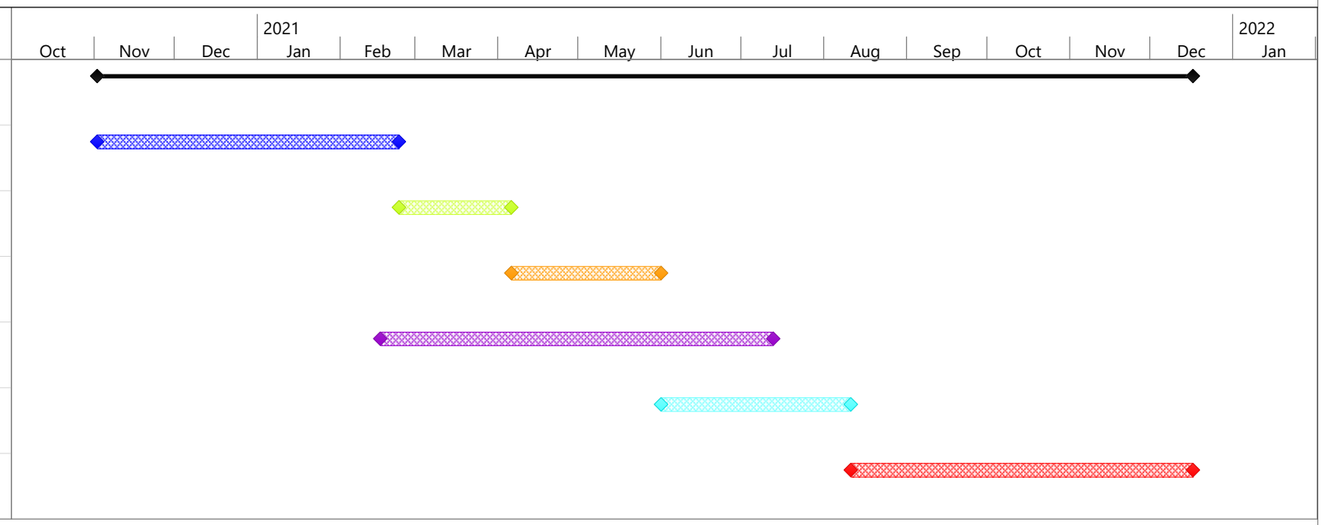


Project: 00074
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 6
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 6**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

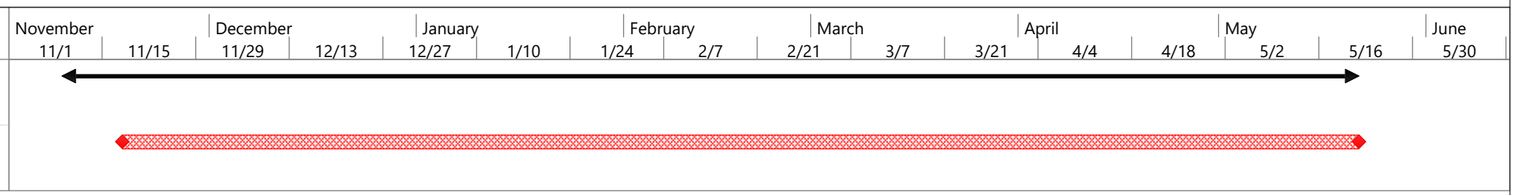


Project: 00075
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BUCKWALTER MULTI-COUNTY COMMERCE PARK
LEC EXPANSION - PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**LEC Expansion**	**140 days**	**Mon 11/9/20**	**Fri 5/21/21**
2	**Construction**	**133 days**	**Wed 11/18/20**	**Fri 5/21/21**

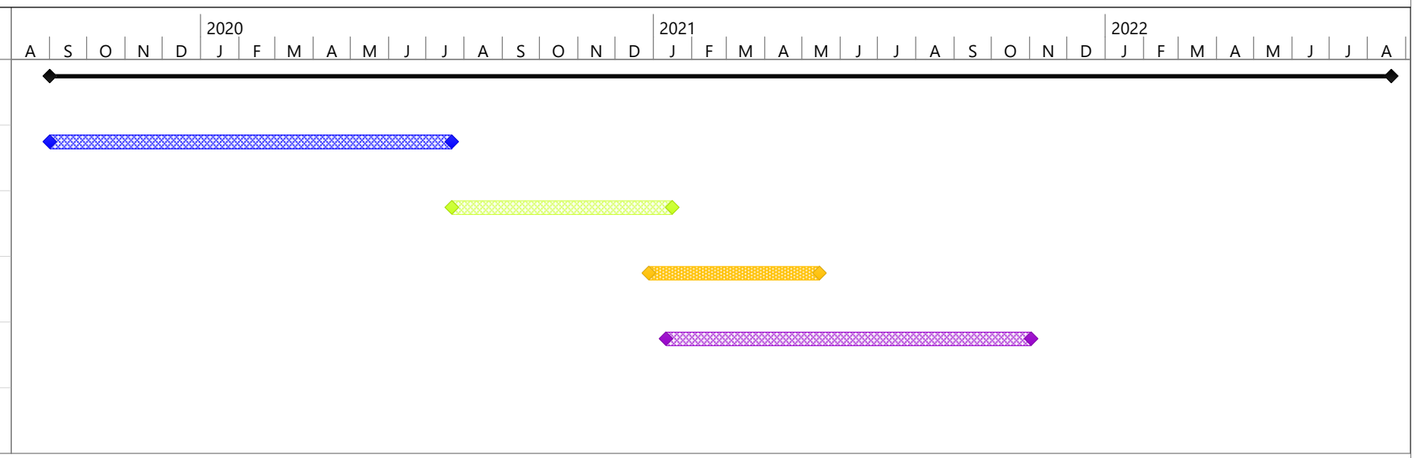


Project: 00077
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

BRIDGE STREET STREETSCAPE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**BRIDGE STREET STREETSCAPE**	**776 days**	**Sun 9/1/19**	**Fri 8/19/22**
2	**Planning and Conceptual Design**	**232 days**	**Sun 9/1/19**	**Tue 7/21/20**
17	**Final Design and Construction Documents**	**128 days**	**Wed 7/22/20**	**Fri 1/15/21**
22	**Permitting**	**100 days**	**Mon 12/28/20**	**Fri 5/14/21**
27	**Easements and Land Acquisition**	**211 days?**	**Mon 1/11/21**	**Mon 11/1/21**
37	**Construction**			

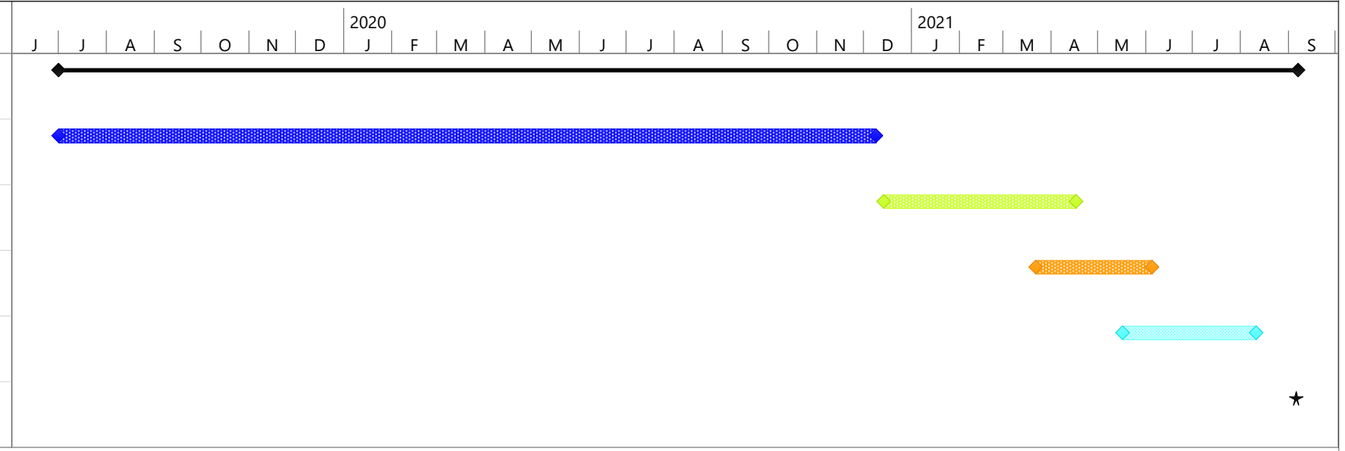


Project: 00082
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

NEW RIVERSIDE PARK/BARN SITE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**NEW RIVERSIDE PARK/BARN SITE**	**571 days**	**Mon 7/1/19**	**Mon 9/6/21**
2	**Planning and Conceptual Master Plan**	**377 days**	**Mon 7/1/19**	**Tue 12/8/20**
27	**Final Design (Phase 1)**	**90 days**	**Mon 12/14/20**	**Fri 4/16/21**
36	**Permitting (Phase 1)**	**55 days**	**Mon 3/22/21**	**Fri 6/4/21**
40	**Bidding (Phase 1)**	**62 days**	**Mon 5/17/21**	**Tue 8/10/21**
46	**Construction Start**	**1 day**	**Mon 9/6/21**	**Mon 9/6/21**

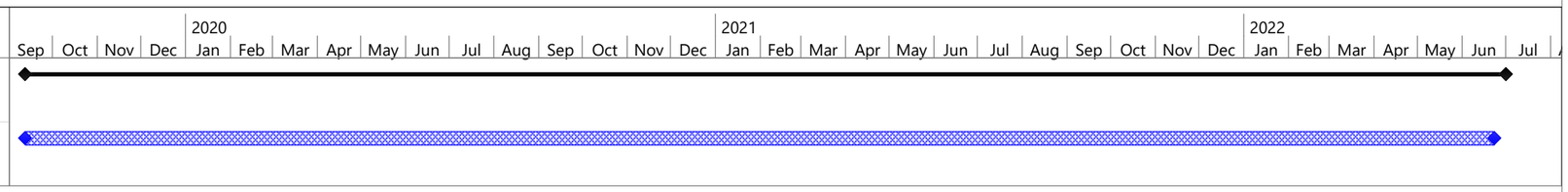


Project: 00085
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

GHOST ROADS
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**GHOST ROADS**	**731 days**	**Thu 9/12/19**	**Thu 6/30/22**
2	**Planning and Conceptual Design**	**731 days**	**Thu 9/12/19**	**Thu 6/30/22**

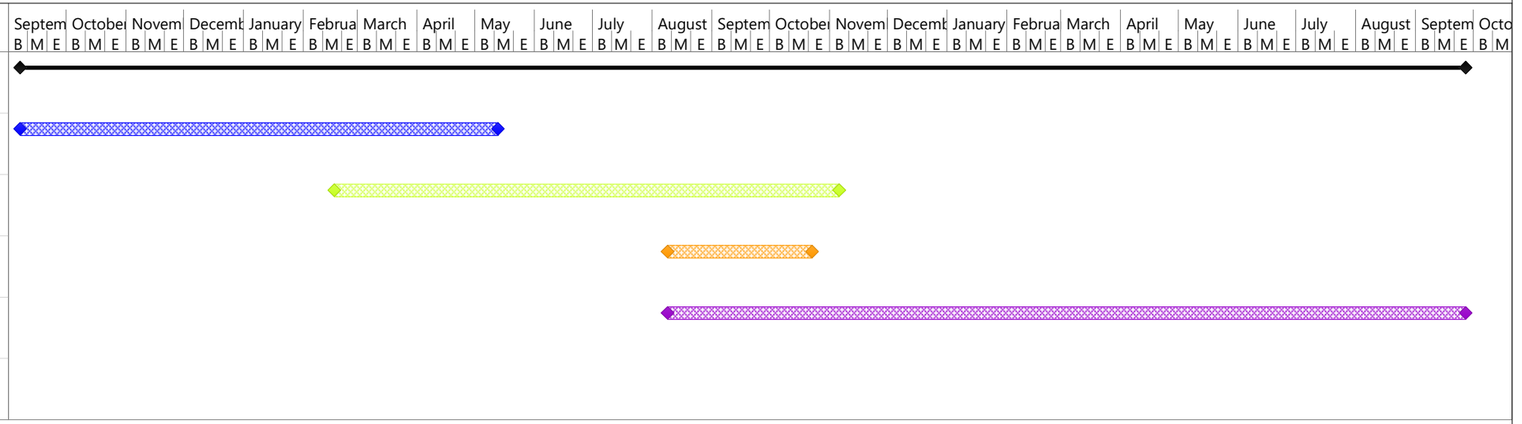


Project: 00093
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

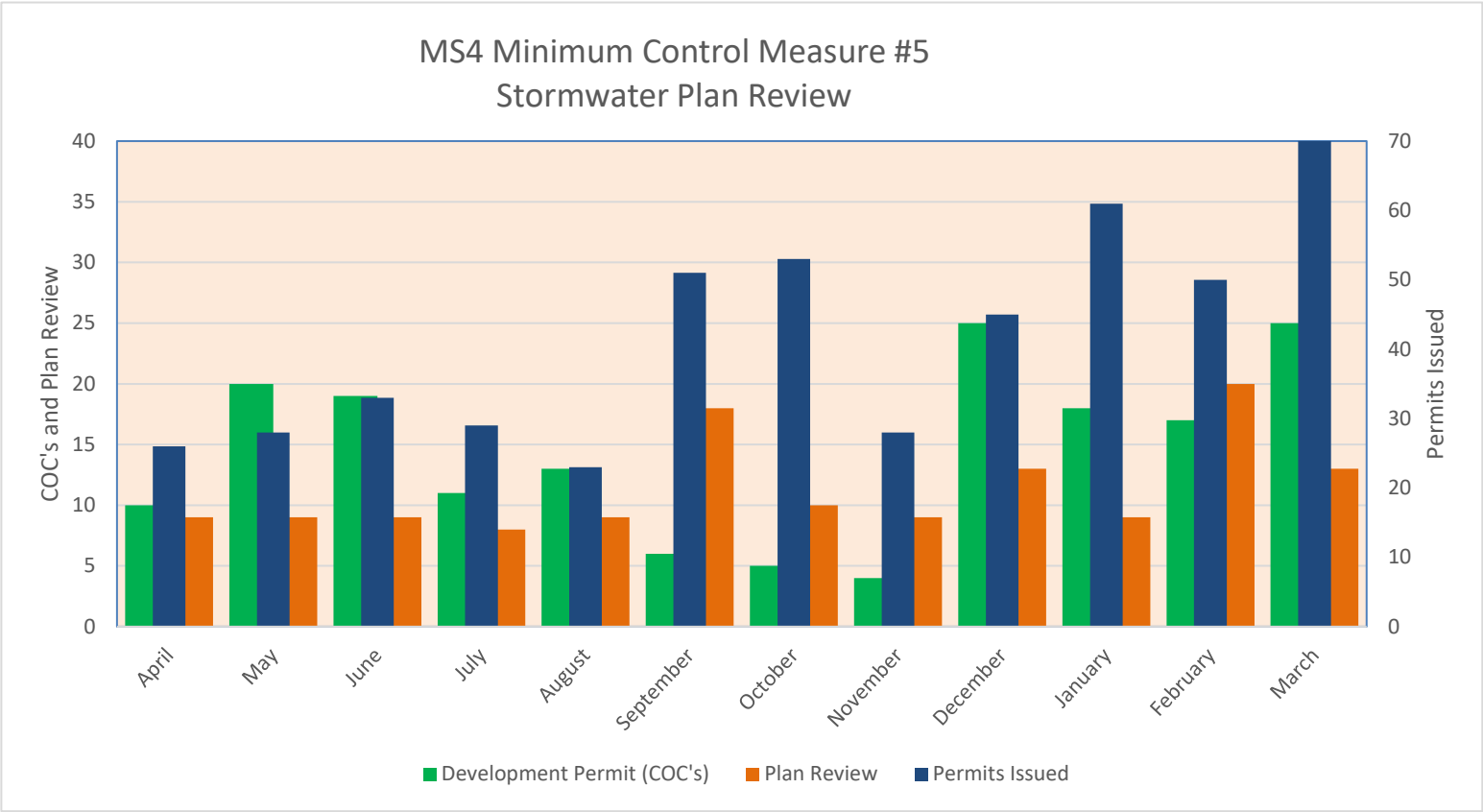
BOUNDARY STREET STREETSCAPE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**BOUNDARY STREET STREETSCAPE**	**536 days**	**Mon 9/7/20**	**Mon 9/26/22**
2	**Planning and Conceptual Design**	**178 days**	**Mon 9/7/20**	**Wed 5/12/21**
13	**Final Planning and Construction Documents**	**188 days**	**Wed 2/17/21**	**Fri 11/5/21**
27	**Permitting Phase**	**55 days**	**Mon 8/9/21**	**Fri 10/22/21**
32	**Easements and Land Acquisition**	**296 days**	**Mon 8/9/21**	**Mon 9/26/22**
41	**Construction**			

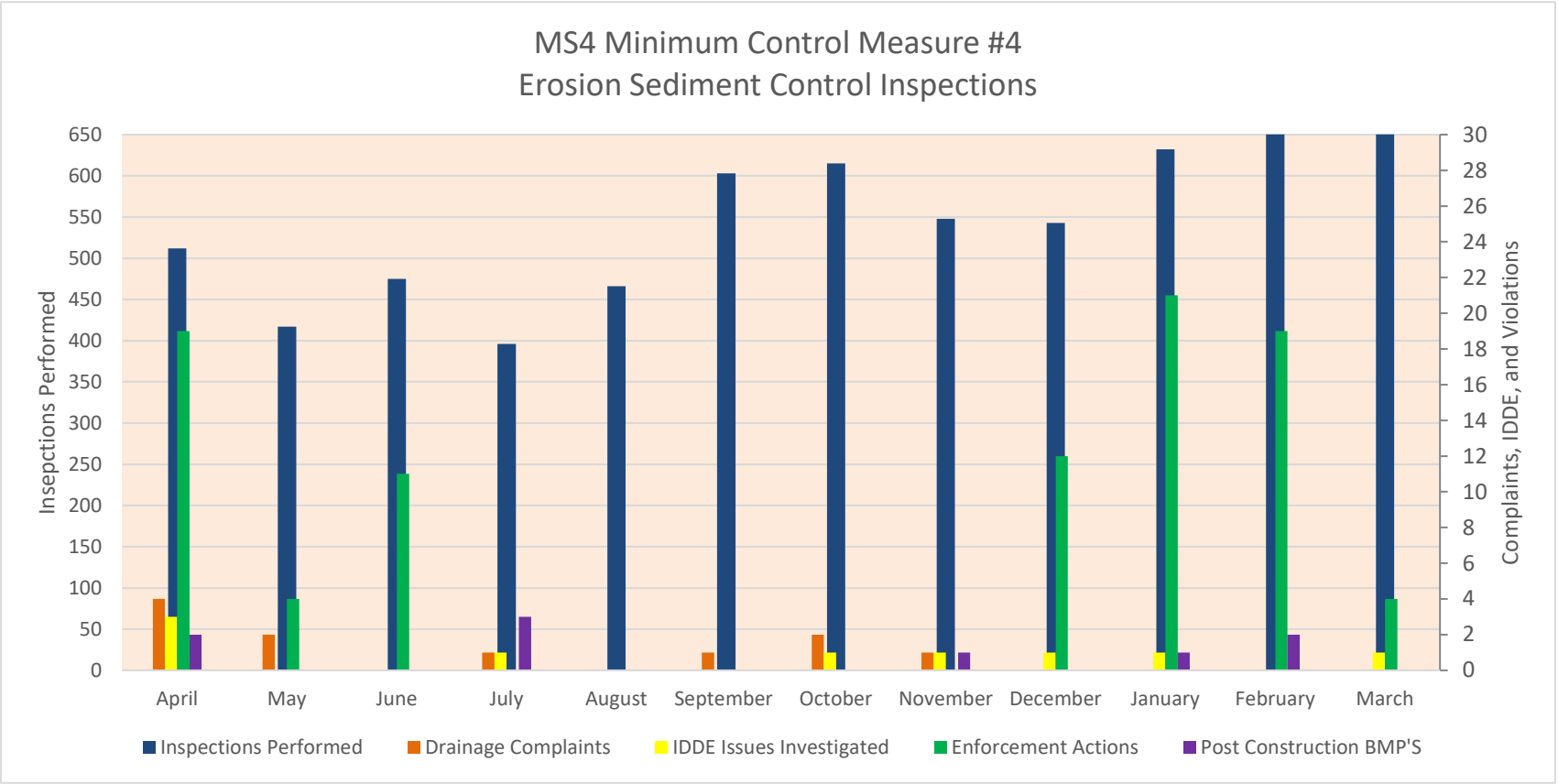


Project: 00094
Date: Wed 1/27/21

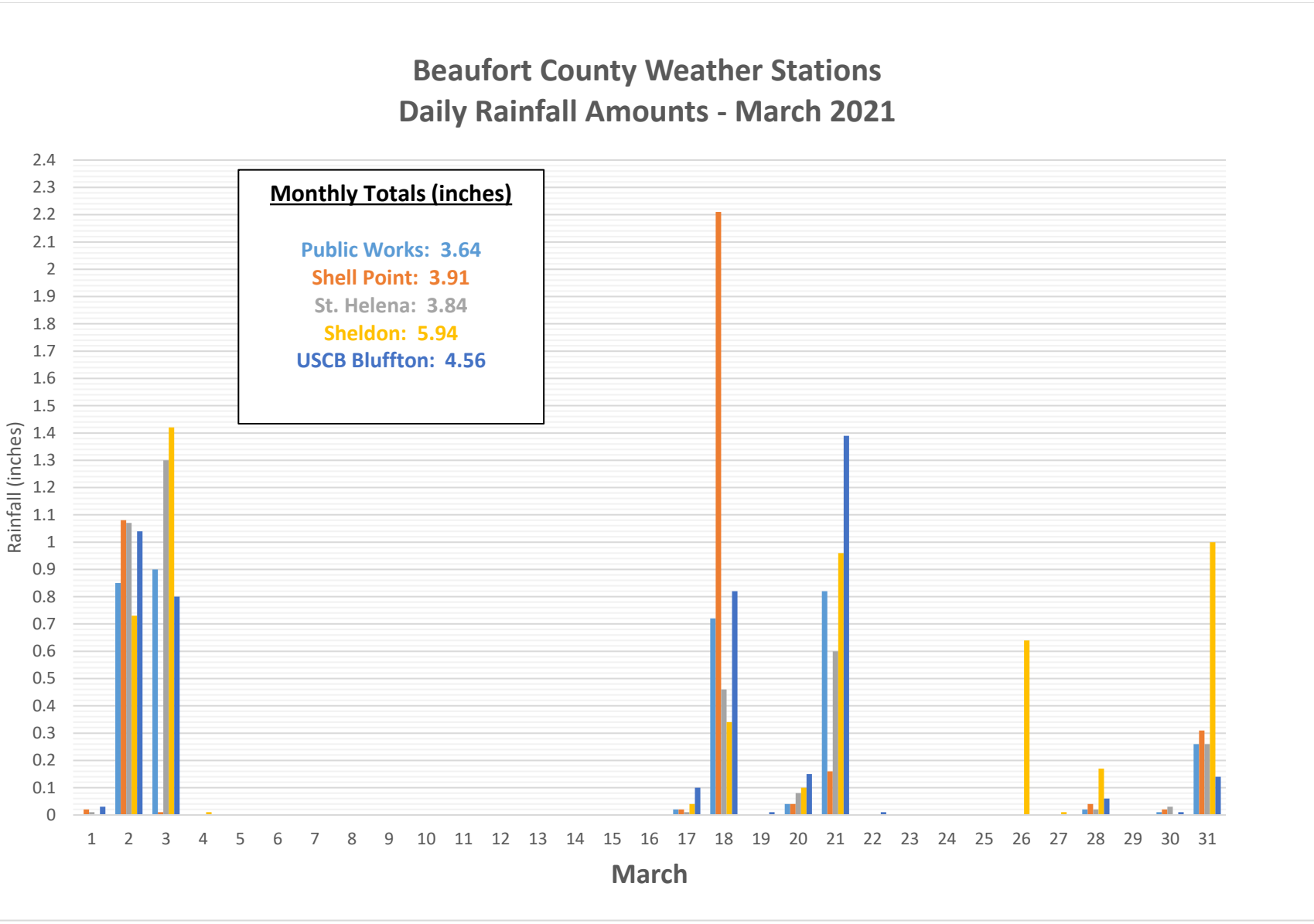
Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction



TYPE	April	May	June	July	August	September	October	November	December	January	February	March	Last 12 Months
Development Permit (COC's)	10	20	19	11	13	6	5	4	25	18	17	25	173
Plan Review	9	9	9	8	9	18	10	9	13	9	20	13	136
Permits Issued	26	28	33	29	23	51	53	28	45	61	50	75	502



TYPE	April	May	June	July	August	September	October	November	December	January	February	March	Last 12 Months
Inspections Performed	512	417	475	396	466	603	615	548	543	632	724	794	6725
Drainage Complaints	4	2	0	1	0	1	2	1	0	0	0	0	11
IDDE Issues Investigated	3	0	0	1	0	0	1	1	1	1	0	1	3
Enforcement Actions	19	4	11	0	0	0	0	0	12	21	19	4	90
Post Construction BMP'S	2	-	-	3	-	-	-	1	0	1	2	0	9


Beaufort County Weather Stations
Daily Rainfall Amounts - March 2021
Monthly Totals (inches)
Public Works: 3.64
Shell Point: 3.91
St. Helena: 3.84
Sheldon: 5.94
USCB Bluffton: 4.56
Rainfall (inches)
2.4
2.3
2.2
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
March

Lowcountry Stormwater Partners (LSP) Monthly Report
3/1/21 – 3/31/21

Completed Stormwater Outreach/Involvement Activities:

- Healthy Pond Series: Aquatic Plant Management
  - 3/04/21, online, 63
- Moss Creek Soil Sample Drive
  - 3/6/20 and 3/29/21, drive received 30 soil samples and follow-up webinar had 8 participants.
- Keeping Ponds Healthy with Proactive Management
  - 3/31/20, online, 30 registrations but 8 participants

Ongoing Stormwater Outreach/Involvement Activities:

- Low Impact Development Design in Coastal SC: Challenging Sites
  - 4/07/21, online, flyer, registration
- Being a Neighbor for Clean Water Webinar Series
  - Tuesdays in April, online, flyer, registration
- That's MY Truck Coloring Contest Planning
  - Flyer coming soon
- Rain Barrel Sale
  - Planned for June
- LSP Website Overhaul
  - The website is complete.
- Mossy Oaks Rain Garden Workshop
  - The school district has approved the plans and I am coordinating to see how installation could be done in the spring.
- Septic System Resources
  - A workshop plan, factsheet series, and magnets are in development for the summer.
- Creation of an HOA Direct Mailing List
  - I began creating a list of mailing addresses for existing HOAs/PUDs to send pond training announcements and an invitation to join the Big News for Small Ponds listserv.
- Direct Contacts
  - During this time frame, I helped three (8) individuals who directly contacted me. One client needed freshwater wetland information, one client had a question about soil samples, one client needed assistance with rain barrels, one had a question about pond resources, and the rest needed help with bank erosion issues.
  - 8, phone call and email
- LSP Facebook page
  - The LSP Facebook page serves to engage and involve citizens in water-quantity and water-quality information. I also use the Facebook page to announce local, regional, and state-wide events.
  - 307 Likes, 414 People Reached with 11 posts made between 3/1/21 and 3/31/21

Planned Stormwater Outreach/Involvement Activities:

- Big News for Small Ponds
    - The "Big News for Small Ponds" mailing list is intended for both pond managers and owners in Beaufort, Jasper, Colleton, and Hampton Counties. By signing up for the mailing list, participants will receive emails or direct mailers about local, pond-related trainings, events, and certification opportunities.
    - 3/8/20, online
- LSP Changing Tides Newsletter
    - The Changing Tides is an informative publication for the general public. It includes a small article on a stormwater-related topic and information on past, current, and future events.
    - 4/2/20, online
- LSP Changing Tides Newsletter
    - The Changing Tides is an informative publication for the general public. It includes a small article on a stormwater-related topic and information on past, current, and future events.
    - 4/20/20, online
- Coastal Flooding and Regulations Workshop (final title TBD)
    - Every Wednesday in June starting June 9th, online

Other Activities for Strategic Plan Compliance:

- Pet Waste Station Map
- Small grants program
- Septic media campaign
- 2021 Beaufort Area Stormwater Pond Conference
- Soil sample post cards and placards for retailers
- Soil sample bag distribution
- Buffer workshop
- Promotional seed packet
- Native plant distributor list
- Native plant signage
- Construction Site Social Media Campaign
- Contractor trainings
- LID Lunch-and-Learns
- BMP workshop for homeowners
- BMP survey

Completed Strategic Plan Items:

- Pond Workshop
- Pond training listserv and direct mailer list
- Pet waste mass media campaign
- 2019 Beaufort Area Stormwater Pond Conference
- Master Pond Manager
- Pond mass media campaign
- Pond management website
- Soil sample trainings (satisfied by Cultivating a Carolina Yards workshops)
- Soil sample bags at festivals, nurseries, farmer's markets, and Master Gardener events
- Construction site trainings for contractors (satisfied by CEPSCI courses)
- LID factsheets
- LID training for design professionals (will be satisfied when DNR's Coastal Training Program reschedules to LID Manual Training)

- LID signs
- BMP workshops for homeowners (satisfied by Cultivating a Carolina Yards workshops, rain garden presentations, and Being a Neighbor for Clean Water Webinar Series)
- Master Rain Gardener
- Step-stake sign for rain gardens
- Rain Garden Rack Card
- Pond Rack Card
- Buffer Packets

MEMORANDUM

Date: April 05, 2021

To: Stormwater Management Utility Board

From: Matthew Rausch, Stormwater Infrastructure Superintendent

Re: **Maintenance Project Report**

This report will cover one major project and six minor projects. The Project Summary Reports are attached.

Major Project:

- **River Oaks Road – Sheldon (SWUD 5):** This project improved 2,580 feet of drainage system. The scope of work included removing blockage from flowline, repairing 700 feet of workshelf, cleaning 1,680 feet of roadside ditch, 200 feet of channel, jetting 10 driveway pipes, 4 crossline pipes and hydroseeding for erosion control. The total cost was **$16,991.11.**

Minor or Routine Projects:

- **Port Royal Island Bush Hog – Port Royal Island (SWUD 6/9):** This project improved 67,446 feet of drainage system. The scope of work included bush hogging 64,751 feet of channel and 2,695 feet of roadside ditch. The total cost was **$38,244.61.**

- **Alljoy Area – Bluffton (SWUD 4):** This project improved 1,577 feet of drainage system. The scope of work included grubbing and clearing 134 feet of workshelf, cleaning out 1,343 feet of roadside ditch, jetting 9 driveway pipes, 4 crossline pipes and 100 feet of roadside pipe. The total cost was **$11,849.80.**

- **David Green Road Channel – St. Helena Island (SWUD 8):** This project improved 2,446 feet of drainage system. The scope of work included cleaning out 2,446 feet of channel, jetting 12 driveway pipes, 3 access pipes and 2 crossline pipes.. The total cost was **$7,404.81.**

- **Candy Johnson Drive Channel – St. Helena Island (SWUD 8):** This project improved 520 feet of drainage system. The scope of work included cleaning out 520 feet of channel. The total cost was **$1,857.05.**

- **Scott Hill Road – St. Helena Island (SWUD 8):** This project improved 902 feet of drainage system. The scope of work included cleaning out 902 feet of roadside ditch. The total cost was **$1,802.86.**

- **Hunters Grove Road Channel – St. Helena Island (SWUD 8):** This project improved 407 feet of drainage system. The scope of work included cleaning out 407 feet of channel. The total cost was **$1,339.75.**

Beaufort County Public Works
Stormwater Infrastructure
Project Summary

Project Summary: River Oaks Road

Activity: Routine/Preventive Maintenance

Duration: 11/16/20-12/15/20

Narrative Description of Project:

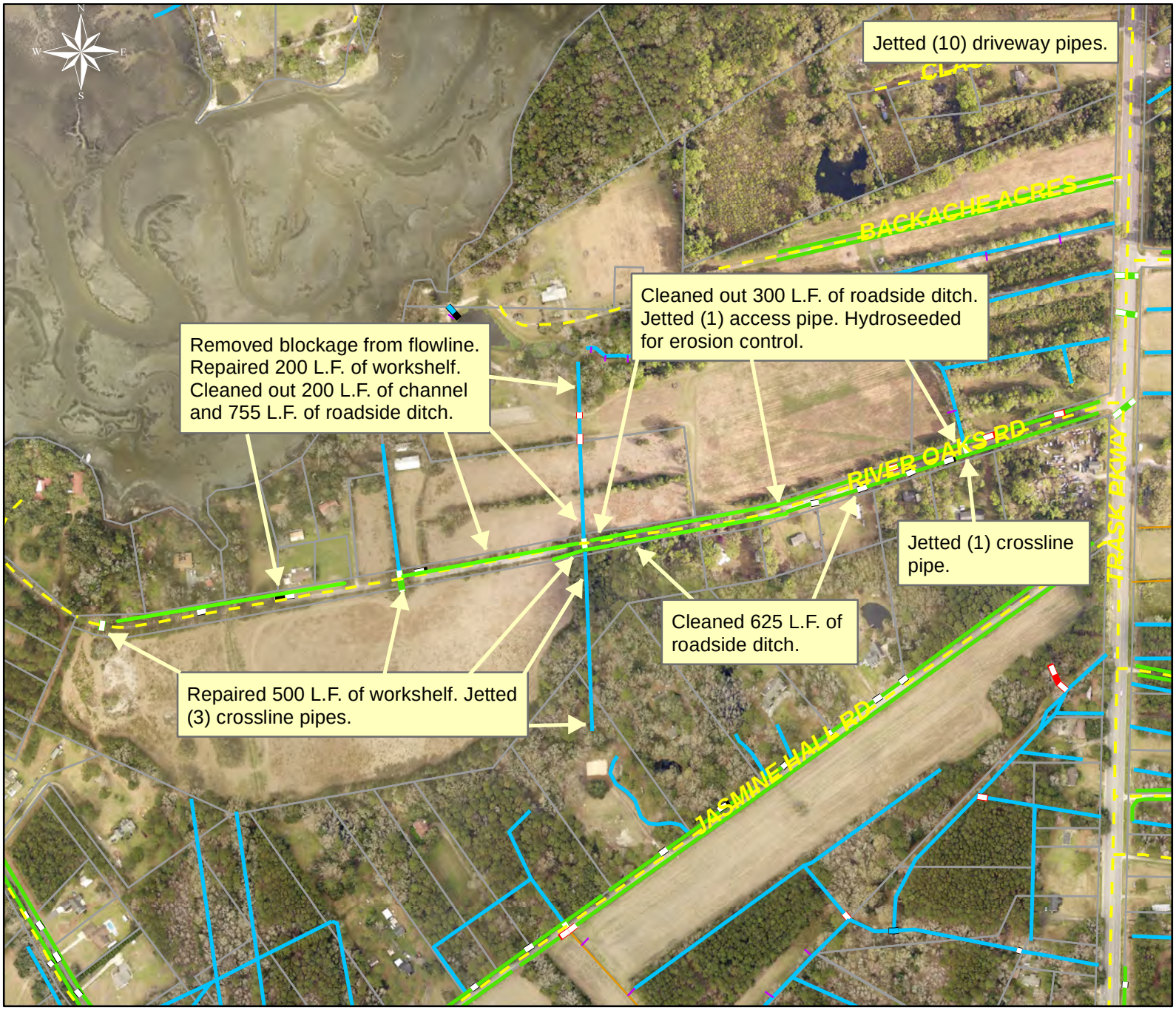
Project improved 2,580 L.F. of drainage system. Removed blockage from flowline. Repaired 700 L.F. of workshelf. Cleaned out 1,680 L.F. of roadside ditch and 200 L.F. of channel. Jetted (10) driveway pipes and (4) crossline pipes. Hydroseeded for erosion control.

2021-512 / River Oaks Road	**Labor Hours**	**Labor Cost**	**Equipment Cost**	**Material Cost**	**Contractor Cost**	**Indirect Labor**	**Total Cost**
AUDIT / Audit Project	2.0	$43.58	$0.00	$0.00	$0.00	$0.00	$43.58
CCO / Channel - cleaned out	48.0	$1,014.64	$202.92	$127.12	$0.00	$309.36	$1,654.04
CLPJT / Crossline Pipe - Jetted	36.0	$830.80	$630.52	$136.48	$0.00	$65.88	$1,663.68
DPJT / Driveway Pipe - Jetted	42.0	$960.75	$804.72	$158.56	$0.00	$0.00	$1,924.03
HAUL / Hauling	87.0	$1,920.93	$1,658.22	$1,029.94	$0.00	$288.40	$4,897.49
HYDR / Hydroseeding	32.0	$684.36	$145.73	$460.54	$0.00	$158.76	$1,449.39
RSDCL / Roadside Ditch - Cleanout	120.0	$2,555.20	$543.90	$160.32	$0.00	$521.04	$3,780.46
UTLOC / Utility locates	1.0	$24.70	$0.00	$0.00	$0.00	$13.23	$37.93
WSREC / Workshelf - Reconstructed	48.0	$1,014.64	$178.11	$38.40	$0.00	$309.36	$1,540.51
2021-512 / River Oaks Road Project Sub Total	416.0	$9,049.60	$4,164.12	$2,111.36	$0.00	$1,666.03	$16,991.11
Grand Total	**416.0**	**$9,049.60**	**$4,164.12**	**$2,111.36**	**$0.00**	**$1,666.03**	**$16,991.11**

(Before)

(During)

(Ending)



Project: River Oaks Road

Activity: Routine/ Preventive Maintenance

Project #: 2021-512

Township/SW Dist: Sheldon/5

Completed: December 2020

Legend

Drainage Type

- Access Pipe
- Bleeder Pipe
- Channel Pipe
- Channel
- Stream
- Crossline Pipe
- Driveway Pipe
- Lateral
- Lateral Pipe
- River
- Road Pipe
- Roadside
- Roadside Pipe

0 120240 480 720 960 Feet

1 inch = 500 feet

Prepared By: BC Stormwater Management Utility
Date Print:01/19/21
File:C:\project summaries map/River Oaks Road_2021-512

Beaufort County Public Works
Stormwater Infrastructure
Project Summary

Project Summary: Port Royal Island Bush Hog

Activity: Routine/Preventive Maintenance

Duration: 07/01/20-11/10/20

Narrative Description of Project:

First Rotation: 07/01/20-11/10/20 Project improved 67,446 L.F. of drainage system. Bush hogged 64,751 L.F. of channel and 2,695 L.F. of roadside ditch. This project consisted of the following areas: Powell Drive (3,007 L.F.), Shanklin Road (19,742 L.F.), Godwin Road (800 L.F.), Laurel Street E (2,695 L.F.), Schein Loop (2,730 L.F.), Schwartz Road (561 L.F.), Parker Drive (4,584 L.F.), Zehm (1,700 L.F.), Hobcaw Drive (1,533 L.F.), Bay Pine Road (3,551 L.F.), Poppy Hill Road (3,560 L.F.), Mulrain Road (622 L.F.), Smalls Hill Road (1,085 L.F.), Webb Road (295 L.F.), Gamecock Way (1,364 L.F.), Pine Grove Road (1,587 L.F.), Paukie Island Road (950 L.F.), Ihly Farm Road (4,747 L.F.), County Shed Road (1,331 L.F.), Moultrie Circle (545 L.F.), Chisholm Hill Road (5,337 L.F.), Quail Drive (330 L.F.), Irongate Drive (1,549 L.F.), Capehart Circle (282 L.F.), Roseida Road (1,103 L.F.), Gillison Loop (509 L.F.), and Young Circle (912 L.F.)

2021-301 / Port Royal Island Bush Hog	**Labor Hours**	**Labor Cost**	**Equipment Cost**	**Material Cost**	**Contractor Cost**	**Indirect Labor**	**Total Cost**
AUDIT / Audit Project	2.0	$43.58	$0.00	$0.00	$0.00	$0.00	$43.58
CBH / Channel- bushhogged	789.0	$16894.56	$8600.69	$1474.42	$0.00	$10490.24	$37459.91
RDBH / Roadside ditch - bushhogged	16.0	$346.68	$156.44	$16.80	$0.00	$221.20	$741.12
2021-301 / Port Royal Island Bush Hog Project Sub Total	807.0	$17,284.82	$8,757.13	$1491.22	$0.00	$10,711.44	$38,244.61
Grand Total	**807.0**	**$17,284.82**	**$8,757.13**	**$1,491.22**	**$0.00**	**$10,711.44**	**$38,244.61**

Before

During

After

Beaufort County Public Works
Stormwater Infrastructure
Project Summary

Project Summary: Alljoy Area - Allendale Street, Thomas Lawton Drive, Brunson Street

Activity: Routine/Preventive Maintenance

Duration: 08/12/20-10/20/20

Narrative Description of Project:

Project improved 1,577 L.F. of drainage system. Grubbed and cleared 134 L.F. of workshelf. Cleaned out 1,343 L.F. of roadside ditch. Jetted (9) driveway pipes, (4) crossline pipes and 100 L.F. of roadside pipe.

2020-050 / Alljoy Area	**Labor Hours**	**Labor Cost**	**Equipment Cost**	**Material Cost**	**Contractor Cost**	**Indirect Labor**	**Total Cost**
AUDIT / Audit Project	2.0	$43.58	$0.00	$0.00	$0.00	$0.00	$43.58
CLPJT / Crossline Pipe - Jetted	58.0	$1,309.43	$873.36	$180.22	$0.00	$311.79	$2,674.80
DPJT / Driveway Pipe - Jetted	48.0	$1,073.04	$919.68	$167.42	$0.00	$263.52	$2,423.66
HAUL / Hauling	40.0	$802.80	$605.60	$115.73	$0.00	$0.00	$1,524.13
ONJV / Onsite Job Visit	12.0	$256.48	$17.16	$14.40	$0.00	$52.92	$340.96
RSDCL / Roadside Ditch - Cleanout	109.0	$2,352.35	$543.01	$205.94	$0.00	$521.04	$3,622.34
UTLOC / Utility locates	6.5	$157.13	$8.58	$8.00	$0.00	$59.54	$233.25
WSGRB / Workshelf - Grubbed	32.0	$687.28	$145.90	$48.06	$0.00	$105.84	$987.08
2020-050 / Alljoy Area Project Sub Total	307.5	$6,682.09	$3,113.29	$739.77	$0.00	$1,314.65	$11,849.80
Grand Total	**307.5**	**$6,682.09**	**$3,113.29**	**$739.77**	**$0.00**	**$1,314.65**	**$11,849.80**

(No Picture Available)

Project: Alljoy Area - Allendale Street, Thomas Lawton Drive and Brunson Street Map #1

Activity: Routine/ Preventive Maintenance

Project #: 2020-050

Township/SW Dist: Bluffton/4

Completed: October 2020

Legend

Drainage Type

- Access Pipe
- Bleeder Pipe
- Channel Pipe
- Channel
- Stream
- Crossline Pipe
- Driveway Pipe
- Lateral
- Lateral Pipe
- River
- Road Pipe
- Roadside
- Roadside Pipe

0 3060 120 180 240 Feet

1 inch = 210 feet

Prepared By: BC Stormwater Management Utility
Date Print:02/09/21
File:C:\project summaries map/Alljoy Area- Allendale St.,Thomas Lawton Dr. and Brunson St. Map #1_2020-050

Project: Alljoy Area - Allendale Street, Thomas Lawton Drive and Brunson Street Map #2

Activity: Routine/ Preventive Maintenance

Project #: 2020-050

Township/SW Dist: Bluffton/4

Completed: October 2020

Legend

Drainage Type

- Access Pipe
- Bleeder Pipe
- Channel Pipe
- Channel
- Stream
- Crossline Pipe
- Driveway Pipe
- Lateral
- Lateral Pipe
- River
- Road Pipe
- Roadside
- Roadside Pipe

0 25 50 100 150 200 Feet

1 inch = 210 feet

Prepared By: BC Stormwater Management Utility
Date Print:02/09/21
File:C:\project summaries map/Alljoy Area- Allendale St.,Thomas Lawton Dr. and Brunson St. Map #2_2020-050

Beaufort County Public Works
Stormwater Infrastructure
Project Summary

Project Summary: David Green Road Channel

Activity: Routine/Preventive Maintenance
Duration: 11/24/20-12/07/20

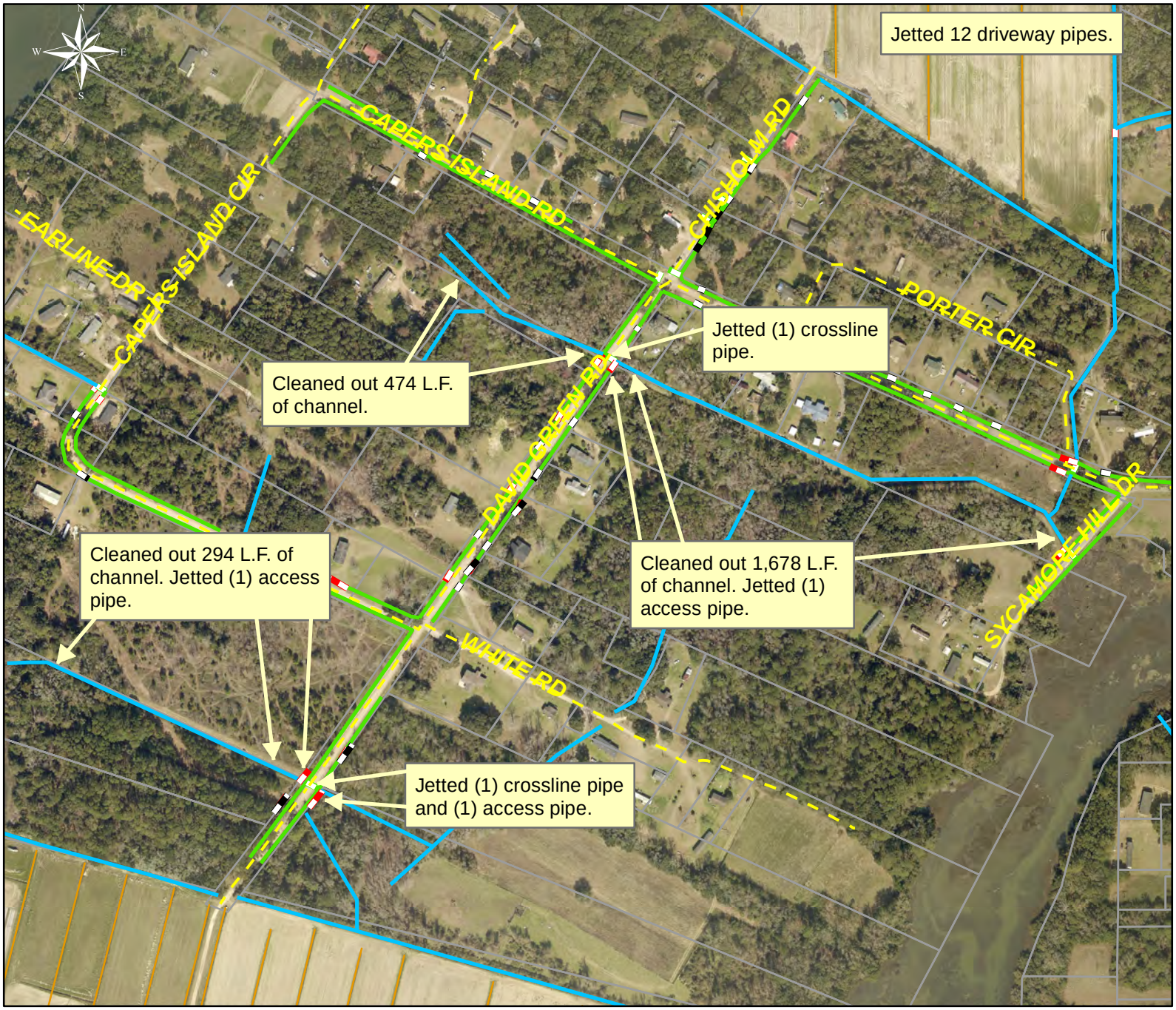
Narrative Description of Project:
Project improved 2,446 L.F. of drainage system. Cleaned out 2,446 L.F. of channel. Jetted (12) driveway pipes, (3) access pipes, and (2) crossline pipes.

2020-043 / David Green Road Channel	**Labor Hours**	**Labor Cost**	**Equipment Cost**	**Material Cost**	**Contractor Cost**	**Indirect Labor**	**Total Cost**
APJT / Access pipe - jetted	24.0	$512.40	$341.36	$59.96	$0.00	$229.44	$1,143.16
AUDIT / Audit Project	1.0	$21.79	$0.00	$0.00	$0.00	$0.00	$21.79
CCO / Channel - cleaned out	80.0	$1,640.84	$556.95	$117.60	$0.00	$687.96	$3,003.35
CLPJT / Crossline Pipe - Jetted	16.0	$366.00	$306.56	$60.68	$0.00	$0.00	$733.24
DEBREM / Debris Removal - Jobsite	24.0	$492.88	$77.74	$23.52	$0.00	$211.68	$805.82
DPJT / Driveway Pipe - Jetted	24.0	$531.76	$459.84	$85.48	$0.00	$246.48	$1,323.56
HAUL / Hauling	8.0	$183.92	$152.48	$37.49	$0.00	$0.00	$373.89
2020-043 / David Green Road Channel Project Sub Total	177.0	$3,749.59	$1,894.93	$384.73	$0.00	$1,375.56	$7,404.81
Grand Total	**177.0**	**$3,749.59**	**$1,894.93**	**$384.73**	**$0.00**	**$1,375.56**	**$7,404.81**

(Before)

(During)

(Ending)



Project: David Green Road Channel

Activity: Routine/ Preventive Maintenance

Project #: 2020-043

Township/SW Dist: St. Helena Island/8

Completed: December 2020

Legend

Drainage Type

- Access Pipe
- Bleeder Pipe
- Channel Pipe
- Channel
- Stream
- Crossline Pipe
- Driveway Pipe
- Lateral
- Lateral Pipe
- River
- Road Pipe
- Roadside
- Roadside Pipe

0 105 210 420 630 840 Feet

1 inch = 420 feet

Prepared By: BC Stormwater Management Utility
Date Print:02/09/21
File:C:\project summaries map/David Green Road Channel_2020-043

Beaufort County Public Works
Stormwater Infrastructure
Project Summary

Project Summary: Candy Johnson Drive Channel

Activity: Routine/Preventive Maintenance
Duration: 12/02/20-12/07/20

Narrative Description of Project:
Project improved 520 L.F. of drainage system. Cleaned out 520 L.F. of channel.

2021-520 / Candy Johnson Drive	**Labor Hours**	**Labor Cost**	**Equipment Cost**	**Material Cost**	**Contractor Cost**	**Indirect Labor**	**Total Cost**
AUDIT / Audit Project	1.0	$21.79	$0.00	$0.00	$0.00	$0.00	$21.79
CCO / Channel - cleaned out	36.0	$739.32	$197.25	$45.60	$0.00	$317.52	$1,299.69
HAUL / Hauling	11.0	$250.73	$209.66	$31.92	$0.00	$43.26	$535.57
2021-520 / Candy Johnson Drive Project Sub Total	48.0	$1,011.84	$406.91	$77.52	$0.00	$360.78	$1,857.05
Grand Total	**48.0**	**$1,011.84**	**$406.91**	**$77.52**	**$0.00**	**$360.78**	**$1,857.05**

(No Pictures Available)

Project: Candy Johnson Drive Channel

Activity: Routine/ Preventive Maintenance

Project #: 2021-520

Township/SW Dist: St. Helena Island/8

Completed: December 2020

Legend

Drainage Type

- Access Pipe
- Bleeder Pipe
- Channel Pipe
- Channel
- Stream
- Crossline Pipe
- Driveway Pipe
- Lateral
- Lateral Pipe
- River
- Road Pipe
- Roadside
- Roadside Pipe

0 50 100 200 300 400 Feet

1 inch = 210 feet

Prepared By: BC Stormwater Management Utility
Date Print:01/19/21
File:C:\project summaries map/Candy Johnson Drive Channel_2021-520

Beaufort County Public Works
Stormwater Infrastructure
Project Summary

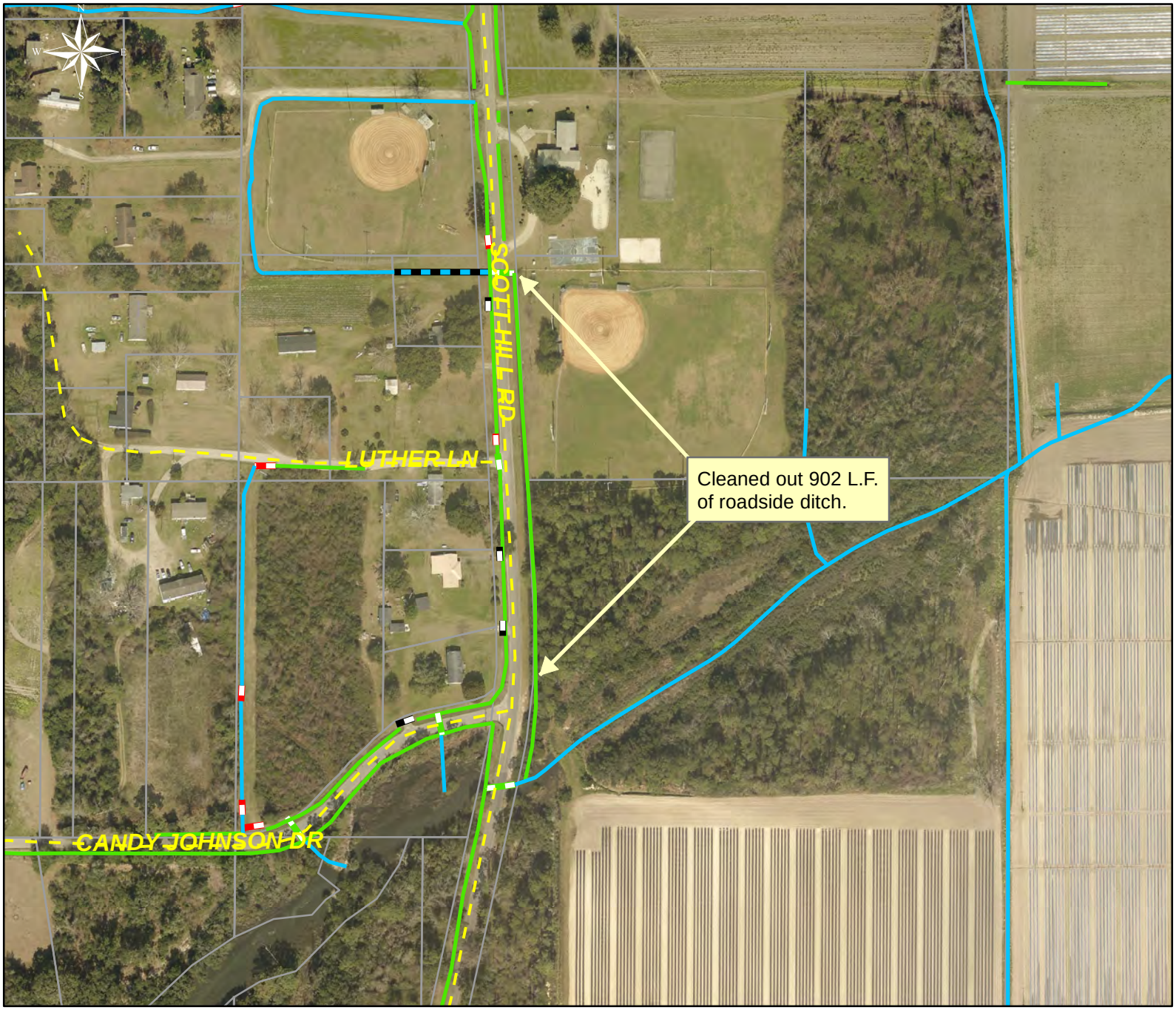
Project Summary: Scott Hill Road

Activity: Routine/Preventive Maintenance
Duration: 12/08/20-12/09/20

Narrative Description of Project:
Project improved 902 L.F. of drainage system. Cleaned out 902 L.F. of roadside ditch.

2021-518 / Scott Hill Road	**Labor Hours**	**Labor Cost**	**Equipment Cost**	**Material Cost**	**Contractor Cost**	**Indirect Labor**	**Total Cost**
AUDIT / Audit Project	1.0	$21.79	$0.00	$0.00	$0.00	$0.00	$21.79
HAUL / Hauling	13.0	$295.27	$247.78	$40.32	$0.00	$72.10	$655.47
RSDCL / Roadside Ditch - Cleanout	28.0	$570.84	$284.28	$58.80	$0.00	$211.68	$1,125.60
2021-518 / Scott Hill Road Project Sub Total	42.0	$887.90	$532.06	$99.12	$0.00	$283.78	$1,802.86
Grand Total	**42.0**	**$887.90**	**$532.06**	**$99.12**	**$0.00**	**$283.78**	**$1,802.86**

(No Pictures Available)



Project: Scott Hill Road

Activity: Routine/ Preventive Maintenance

Project #: 2021-518

Township/SW Dist: St. Helena Island/8

Completed: December 2020

Legend

Drainage Type

- Access Pipe
- Bleeder Pipe
- Channel Pipe
- Channel
- Stream
- Crossline Pipe
- Driveway Pipe
- Lateral
- Lateral Pipe
- River
- Road Pipe
- Roadside
- Roadside Pipe

0 60 120 240 360 480 Feet

1 inch = 250 feet

Prepared By: BC Stormwater Management Utility
Date Print:01/19/21
File:C:\project summaries map/Scott Hill Road_2021-309

Beaufort County Public Works
Stormwater Infrastructure
Project Summary

Project Summary: Hunters Grove Road Channel

Activity: Routine/Preventive Maintenance
Duration: 11/24/20-12/01/20

Narrative Description of Project:
Project improved 407 L.F. of drainage system. Cleaned out 407 L.F. of channel.

2021-515 / Hunters Grove Road	**Labor Hours**	**Labor Cost**	**Equipment Cost**	**Material Cost**	**Contractor Cost**	**Indirect Labor**	**Total Cost**
AUDIT / Audit Project	1.0	$21.79	$0.00	$0.00	$0.00	$0.00	$21.79
CCO / Channel - cleaned out	24.0	$501.68	$110.04	$17.60	$0.00	$203.52	$832.84
HAUL / Hauling	8.0	$178.16	$152.48	$20.16	$0.00	$115.36	$466.16
UTLOC / Utility locates	0.5	$12.35	$0.00	$0.00	$0.00	$6.62	$18.97
2021-515 / Hunters Grove Road Project Sub Total	33.5	$713.98	$262.52	$37.76	$0.00	$325.50	$1,339.75
Grand Total	**33.5**	**$713.98**	**$262.52**	**$37.76**	**$0.00**	**$325.50**	**$1,339.75**

(Before)

(No Picture Available)

(During)

(Ending)

Project: Hunters Grove Road Channel

Activity: Routine/ Preventive Maintenance

Project #: 2021-515

Township/SW Dist: St. Helena Island/8

Completed: December 2020

Legend

Drainage Type

- Access Pipe
- Bleeder Pipe
- Channel Pipe
- Channel
- Stream
- Crossline Pipe
- Driveway Pipe
- Lateral
- Lateral Pipe
- River
- Road Pipe
- Roadside
- Roadside Pipe

0 30 60 120 180 240 Feet

1 inch = 130 feet

Prepared By: BC Stormwater Management Utility
Date Print:01/20/21
File:C:\project summaries map/Hunters Grove Road Channel_2021-515

Beaufort County Stormwater Management Utility Board (SWMU Board) Meeting Minutes

March 10, 2021 at 2:00 p.m.

Beaufort County Council Chambers, Administration Building, Beaufort County Government Robert Smalls Complex, 100 Ribaut Road, Beaufort, South Carolina and via Webex

Board Members

Present	Absent
Allyn Schneider	
James Clark	
Marc Feinberg	
Patrick Mitchell	
Steven Andrews	
Brian Watkins	

Ex-Officio Members

Present	Absent
	Nate Farrow
	Van Willis
	Kim Jones

Beaufort County Staff

Tiffany Patrick
Katie Herrera
Carolyn Wallace

Visitors

Ellen Sturup Comeau, Clemson Extension
Jeff Netzinger, Town of Hilton Head
Alice Howard, County Council
Bryan Durrance

1. Meeting called to order – Marc Feinberg at 2:00 pm

A. Agenda – Approved

B. Approval of Minutes – Approved

2. Introductions – Completed.

3. Public Comment(s) – None.

4. Reports

Reports attached in agenda

Highlights:

A. Utility Update – Katie Herrera

- ✓ Southern Lowcountry Regional Board (SoLoCo)
  - o All project milestones have been reached and the design manual has been completed. Design standards were implemented February 1, 2021.

- ✓ A request was received from Mr. Andrews to present on the Battery Creek watershed and bacteria levels. Katie will present on that at the June board meeting.

- ✓ DHEC will be present at the September meeting to present their annual report summary.

- ✓ The county continues to work on delinquent accounts for the military installations. This is still being handled by the county's legal department.

- ✓ Reminder: Annual Financial report from the Municipalities are due – Per the Intergovernmental Agreements for the Utility, each year on September 30th, the City and Towns are required to submit a summary of revenue and expenditures for the previous fiscal year.
    - ***Beaufort County –*** Waiting on annual financial report, anticipating completion in April.
    - ***Town of Hilton Head Island – Received.***
    - ***Town of Bluffton – Received.***
    - Town of Port Royal – Not received.
    - City of Beaufort – Not received

B. Monitoring Update – Katie Herrera
Highlights:

- ✓ Drainage studies for Pepper Hall began.

- ✓ Okatie West Pond Bold and Gold testing results have been unsuccessful due to low bacteria.

- ✓ Port Royal redevelopment and Cypress Wetlands testing continues.

C. Stormwater Implementation Committee (SWIC) Report – Katie Herrera
Highlights:

- ✓ The annual report memo as well as the management fee memo was submitted to the municipalities. They have until April 1, 2021 to provide concurrence letters.

D. Stormwater Related Projects – Katie Herrera
Highlights:

- ✓ County staff continues to work on getting easements and meets monthly to review.

- ✓ The flyover bridge permitting and updating of new cost estimates has been completed. Beaufort County will be using the list of contractors under $15,000 to complete the work.

- ✓ Shell Point Community – County staff will meet with Cranston Engineering on March 12, 2021 to extend the contract until May 31, 2021. The extended contract ensures all project milestones have been completed and the participation of Cranston Engineering in public hearings and meetings.

- ✓ Factory Creek Watershed Regional Detention Basin "Phase I" & Academy Park Subdivision – Construction is complete and ready for close out. Andrews Engineering is scheduled to complete the as-built by the end of March.

- ✓ Factory Creek Watershed Regional Detention Basin "Phase II – Construction has been completed and will only require an easement acquisition.

- ✓ Graves Property – Staff is meeting with developers and owners on a bi-monthly basis to make sure all departments within the county are fully aware of the steps still needed to be taken. Beaufort County has issued the first payment for $375,000 based on the development agreement requirement to pay 50% of stormwater infrastructure and drainage costs that the developer incurs.

- ✓ Lady's Island Plan, Sea Level Rise, and "no-fill" ordinance – The committee is working behind the scenes with the Charleston group and Community Development Director, Mr. Rod Merchant to finalize the plan.

E. Professional Contracts Report – Katie Herrera
Highlights:

- ✓ Salt Creek and Shanklin Road – All necessary permits have been obtained. Beaufort County is still working with DOT. The county is not getting community feedback. After Quarter One of Fiscal Year 2022, if there is no interest by property owners to participate in regional BMPs, they will be taken off the CIP list. The next step is to get the land acquisition lawyer involved to ensure that people are not interested in this project and then move forward.

- ✓ Brewer Memorial – Conditional final SRT approval has been received. The Beaufort County Open Land Trust has approved the plans as designed and the County is awaiting final SRT approval.

- ✓ Evergreen Regional Pond 319 – The final contract has been sent to CBG Incorporated for their signature and then the project can proceed.

- ✓ Stormwater engineering consulting services – Woolpert conducted in house training in February for Beaufort County employees and The Town of Bluffton, The Town of Hilton Head Island, The City of Beaufort and the Town of Port Royal staff. Woolpert completed a review of the TMDL that is to be written for Capers Creek.

F. Regional Coordination – Katie Herrera
Highlights:

- ✓ Mossy Oaks Task Force – Completion of construction is rapidly coming to an end for both phases of the project. The engineering analysis has demonstrated that the previous drainage system within that system was not constructed taking the entire area into consideration, this has now been corrected with the new plan. The final project close out is anticipated by late April or early May 2021. The project has been on schedule and on budget.

G. Municipal Reports – Katie Herrera
Reports attached in agenda
Highlights:
Reports information.

- ✓ Brian Eber, Town of Hilton Head Island MS4 Coordinator, Bill Bower, Town of Bluffton, and Katie Herrera met mid-February to discuss efforts with MS4 compliance.

- ✓ Town of Hilton Head Island (From Jeff Netzinger, Stormwater Manager)
  - o Reports Received
  - o Major capital improvements were completed last year overhauling the Jarvis Creek pump station. This fall the same will begin with the Lawton pump station in Sea Pines.
  - o Application was submitted for the work on these pump stations with the Municipal Association of South Carolina in the Public Works category. The Town of Hilton Head Island was selected as the winner for that award.

- ✓ Town of Bluffton (From Kim Jones, Watershed Management Division Director)
  - o Reports Received – attached to the minutes

- ✓ City of Beaufort (From Nate Farrow, Public Works Director)
  - o No information was available at the time of this report.

- ✓ Town of Port Royal (From Van Willis, Town Manager)
  - o No information was available at the time of this report.

H. MS4 Update – Katie Herrera

Highlights:

- ✓ Permits, permit issuance, plan reviews and inspections have not subsided. The County had over 700 inspections last month.

- ✓ Rainfall Report – Beaufort County received quite a bit of rain but is not seeing an influx of drainage issues.

- ✓ Katie Herrera will be filming with the County Channel at Okatie West Pond to talk about the MS4 program and the history of the EPA and Clean Water Act.

- ✓ MS4 Statewide General Permit – Paul Quattlebaum has left DHEC; Beaufort County is anticipating delays on MS4 permits until his position is filled. The statewide general permit for construction was effective as of March 1, 2021. Anything less than one acre is going to receive automatic coverage for the NOI. Construction activities related to public emergency will not require permits to be in place prior to the work being started, they will have 30 days to let the state know that work has begun.

- ✓ Education Report - Ellen Sturup Comeau, Clemson Extension
  - o Upcoming webinar, Keeping Ponds Healthy with Proactive Management will be held on March 31, 2021. The Clemson Extension water resources team is bringing back the Being a Neighbor for Clean Water webinars. More information can be found on the Facebook page.
  - o The first ever rain barrel sale is in the works for this summer.
  - o In person events are still limited at this time.

I. Maintenance Projects Report – Katie Herrera
Highlights:

- ✓ One major project:
  - Buckwalter Parkway – Bluffton (SWUD 4): $19,934.85

- ✓ Six minor or routine projects:
  - Lady's Island Bush Hog – Lady's Island (SWUD 7): $19,837.48
  - St. Helena Island Vacuum Truck – St. Helena Island (SWUD 8): $14,738.62
  - Roseida Road – Port Royal Island (SWUD 9): $4,064.64
  - Chisholm Hill Road Channel #1 – Port Royal Island (SWUD 6): $3,912.98
  - Bluffton Bush Hog – Bluffton (SWUD 4): $3,646.15
  - Brickyard Point Road N – Lady's Island (SWUD 7): $1,980.68

J. Liaison Report – Beaufort County Council - Alice Howard
Highlights:

- ✓ The mayors of The City of Beaufort and the Town of Port Royal have both written letters regarding their opposition to collecting stormwater fees from the military.

5. New Business –

- ✓ Katie Herrera acknowledged Carolyn Wallace's exemplary work on this year's Stormwater budget.

- ✓ The budget summary was sent to the board on March 1, 2021. One question was received from Alice Howard regarding the stormwater engineering study of the Shell Point area and whether or not that was included in a category underneath the budget. Results from that study are still pending, once received a task force will be created to oversee that the correct participants are included and that the correct improvements are being funded. It will then be included in the budget. The board has concerns with the tardiness of the reports from Cranston Engineering. Katie stated that it has been noted by Beaufort County as well.

- ✓ FY22 Budget Summary Report –
  Report attached in agenda

  - The budget has been entered into the financial system and will be going to County Council for review beginning in April 2021.
  - Work is being done to update the MOUs and MOAs within municipalities.
  - Mr. Feinberg noted that it was anticipated last year that the budget would be $500,000 and it is now up to $750,000 for next year. The Stormwater budget has to absorb the increase. Katie responded that the increase for next year is due to the work on the roads and infrastructure that is going for final permitting at this time, the bulk of the infrastructure construction is expected to be completed in FY22.
  - Mr. Feinberg requested a presentation by the legal team tasked with the military delinquency fees.

6. Public Comment(s) – *None*

7. Next Meeting Agenda –

- ✓ Mr. Feinberg requested to move meetings to bi-monthly. Katie responded that Boards and Commissions would need to be consulted to make certain that FOIA requirements are being followed. The current schedule was created and approved by the board in November 2020 based upon important milestones throughout the year. A board packet is provided monthly to keep board members abreast of all information.
- ✓ Mr. Watkins motioned to set the meetings to bi-monthly. The motion failed by vote.
- ✓ Mr. Mitchell motioned that the next meeting will be as scheduled June 9, 2021 and at that time the board will revisit the schedule to make it bi-monthly if necessary. Motioned passed unanimously.
- ✓ Mr. Schneider motioned that the Stormwater Utility Board recommend that Beaufort County Council approve the budget as presented. Motion passed unanimously.
- ✓ Mr. Feinberg would like to add to the June agenda to have Beaufort County's legal personnel present to the board regarding the military's delinquent accounts.
- ✓ Mr. Feinberg would like a report from Dr. Montie added to the June agenda.
- ✓ Mr. Schneider moved to approve an amended June agenda with the two additions.
- ✓ Mr. Clark requested a Shell Point presentation be added to the June agenda.
- ✓ Mr. Mitchell amended his motion to: the next meeting will be as scheduled June 9, 2021 with the three amended discussions to be added to the agenda. Motion passed unanimously.
- ✓ Amended agenda approved by vote.

8. Meeting Adjourned

TOWN COUNCIL

STAFF REPORT
Engineering Department

MEETING DATE:	March 9, 2021
SUBJECT:	Engineering Department Monthly Report
PROJECT MANAGER:	Bryan McIlwee, Director of Engineering

CAPITAL IMPROVEMENTS PROGRAM (CIP) AND SPECIAL PROJECTS UPDATE

PATHWAYS

1. Goethe-Shults Sidewalks Phase 2

- Construction documents and easements are complete.
- Invitation for Bids were posted on 1/8/2021
- **Next Steps**
  - Obtain bids on 2/15/2021.
  - Submit contract for approval at the March Town Council meeting.

2. Buck Island-Simmonsville Neighborhood Sidewalks and Lighting

- Phase 5 Kitty Road to 301 Buck Island Road, construction is complete. Design of street lighting is underway.
- Phase 6A along Simmonsville Road from Grayco northward to Sugaree Drive is under design and permit review. Invitation to bid to be posted in February.
- Phase 6B along Simmonsville Road from Sugaree Drive northward to the existing New Mustang Road sidewalks is under design.
- **Next Steps**
  - Phase 5 from Kitty Road to lot 310 Buck Island Road inspection and permit closeout.
  - Submit Phase 5 street lighting for an SCDOT encroachment permit. Install street lighting in the second quarter of 2021.
  - Phase 6 design and construction of the remaining Simmonsville Road sidewalks, to be completed in FY 2021-2022.

3. Bridge Street Streetscape

- Construction documents and permitting are underway for Phase 1 streetscape, Burnt Church Road to Calhoun Street. 70% construction drawings are complete and Staff provided plan comments to Cranston Engineering.

- SCDHEC 319 grant application was awarded for $179,700 for drainage and water quality improvements.
- **Next Steps**
  - Complete engineering design in February 2021.
  - Execute contract with Cranston Engineering to complete design modifications and reporting related to the 319 Grant.
  - Prepare easement plats, appraisals, obtain easements and issue bid documents in FY 2021.
  - Construction to start in FY 2022.

4. Boundary Street Streetscape

- Obtained contract approval for engineering services with Thomas and Hutton.
- Project kick off meeting on 1/28/21
- **Next Steps**
  - Begin Preliminary Engineering Design in February 2021.

5. New Riverside Linear Trail

- **Next Steps**
  - Begin surveying and prepare a Conceptual Master Plan in FY 2022, pending budget approval.
  - Research grant opportunities to fund planning and construction of future trail improvements.

SEWER & WATER

1. Buck Island-Simmonsville Sewer (Phases 5A-5D)

- Construction is underway on Phase 5A-D.
- **Next Steps**
  - Complete construction on Phase 5A-D by 7/1/21 contingent upon no extensive weather delays or unforeseen utility conflicts.
  - Start house connections after the main line is approved by DHEC.

2. Historic District Sewer Extension Phase 1 - Pritchard Street

- Construction has started.
- **Next Steps**
  - Start house connections after the main line is approved by DHEC.

3. Historic District Sewer Extension Phase 2 - Bridge Street

- Received SCDHEC permit to construct.
- Continue negotiations with property owners for right of entry agreements.

- **Next Steps**
  - Obtain road ownership from SCDOT.
  - Advertise for bids.

4. Historic District Sewer Extension Phase 3 – Colcock Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

5. Historic District Sewer Extension Phase 4 – Lawrence Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

6. Historic District Sewer Extension Phase 5 – Green Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

7. Historic District Sewer Extension Phase 6 – Water Street

- Started surveying and design.
- **Next Steps**
  - Review design drawings.

HISTORIC DISTRICT IMPROVEMENTS

1. Boundary Street Lighting

- Phase 2 photometric plans complete.
- Received encroachment permit from SCDOT.
- Lighting agreements approved by Town Council in May 2020.
- Agreement has been executed by both parties.
- Dominion Energy is negotiating modifications to SCDOT encroachment permits.
- SCDOT and Dominion indicated poles must be installed on Private Property due to conflicts with Sewer Force Main along Boundary Street
- **Next Steps**
  - Obtain easements as needed for Phase 2 street lighting.
  - Begin installation of street lighting in March 2021.

2. Historic District Enhancements

- Watershed Management Staff is evaluating preliminary plans to prepare drainage solutions at AME Church.
- Traffic calming guidelines and plan are being negotiated with engineering consultant.

- **Next Steps**
  - ADA ramps and crosswalks are being mapped in Cartegraph by GIS/IT.
  - Continue planning of crosswalks and ADA improvements.
  - Complete Traffic Calming Assessment and Plan.

3. Calhoun Street Streetscape

- Conceptual Master Planning is complete and reviewed at the July Quarterly Workshop.
- Obtained contract approval for Engineering services at the January 2021 Town Council meeting
- Project Kick-off meeting on 1/28/2021.
- **Next Steps**
  - Begin Engineering design in February 2021.

4. Squire Pope Carriage House Preservation

- Construction Documents are complete and submitted to SHPO for a courtesy review.
- **Next Steps**
  - Finalize any modifications to the Construction Documents and prepare bid solicitation package.
  - Awaiting budget approval for future construction.
  - Coordinate design of "Coming Soon" sign.

PARK DEVELOPMENT

1. Oyster Factory Park

- Conceptual Master Plan has been updated and reviewed by Town Council at the January Quarterly Workshop.
- **Next Steps**
  - Obtain ACOE and DHEC Permit for installation of salvaged dock components from Calhoun Street.
  - Begin final design of next phase of improvements per Town Council direction provided at the Workshop.

2. 68 Boundary Street Park Renovations

- Construction and maintenance contracts complete.
- **Next Steps**
  - Fabricate Martin Family dedication sign prior to 4/8/2021 park dedication.

3. Calhoun Street Dock and Public Riverfront Access Improvements

- Dock construction is complete.
- **Next Steps**
  - Complete installation of Dock signage.

4. Wright Family Park

- Bulkhead, boardwalk, restroom building, perimeter sidewalks, landscaping and parking area are complete.
- Site signage, and furniture are 99% complete.
- **Next Steps**
  - Coordinate Ribbon Cutting Ceremony as pandemic allows.
  - Additional benches are on reorder and will be installed in February 2021.
  - Prepare change order to add a sidewalk connection from park to the hammerhead/dock.

5. Oscar Frazier Park

- **Next Step**
  - Sidewalk construction complete.
  - Continue planning of future improvements in FY 2022.

6. New Riverside Barn/Park

- Submitted grant application to LWCF for $500,000.00 funding of the initial phase of the project. Application is under review by NPS and Staff expects to hear response in the Spring of 2021.
- Archeological Report complete as needed for Grant eligibility.
- Obtained Town Council approval of the Conceptual Master Plan at the December 2020 Council meeting.
- Obtained Proposals from Thomas and Hutton for Phase 1 Engineering design.
- **Next Steps**
  - Hart Howerton to complete Design Development drawings for Phase 1 site development and schematic design of barn improvements.
  - Complete construction drawings, cost estimating and permitting of Phase 1 development by July 2021.
  - Phase 1 bidding and construction anticipated to begin in FY 2022.

TOWN FACILITIES AND MISCELLANEOUS PLANNING

1. Buckwalter Place Multi-County Commerce Park

- Buckwalter Place Park and Veterans Memorial are complete. Additional work was approved to modify irrigation system conversion from irrigation pond to BJWSA system.
- Executed contracts for Buckwalter Park restroom design with Thomas and Hutton and Pearce Scott Architects.
- Site planning for future development parcel underway with Cranston Engineering.
- Prepared estimate of probable construction cost and appraisal for future development site.

- **Next Steps**
  - Complete irrigation conversion at Park by January 2021.
  - Review progress plans for restroom building and utility extensions at Buckwalter Park.
  - Continue site planning for future development parcel.

2. Town of Bluffton Housing Project

- Surveying and geotechnical services complete for 1095 May River Road and 115 Bluffton Road sites.
- **Next Steps**
  - Planning and design to begin in FY 2021 as directed by Joint Venture Agreement.
  - Assist with the preparation of a comprehensive cost estimate for planning, design and construction for the various housing projects.

3. Law Enforcement Center Facility Improvements

- Parking and Service Yard Expansion construction began in December 2020 with CBG Siteworks Construction.
- Interior paint of Substation complete.
- **Next Steps**
  - Continue construction of LEC service yard and parking improvements. Construction anticipated to be complete by the July 2021.
  - Information Technology department coordinating upgrades to building security systems.

4. Ghost Roads

- Surveying and easement exhibits are complete.
- Pritchard Street Quit Claim Deed exhibits are 95% complete.
- The Town Attorney is working with Bridge Street property owners to obtain Quit Claim Deeds and agreement to extend service to homes.
- Staff is meeting with individual property owners to raise awareness of the acquisition efforts and communicate next steps.
- **Next Steps**
  - Continue meeting with individual property owners and obtaining quit claim deeds.

5. Community Safety Cameras

- Cameras have been installed at Bluffton Road Public Parking Lot, Veterans Park, Wright Family Park, Calhoun Street Dock .
- 14 older cameras in the network have been replaced.
- **Next Steps**
  - Continue with camera replacements and upgrades as necessary.

6. Public Works Facility Improvements

- Finalize the plans for expanding of Public Works yard.
- Install new plumbing/ electric for the washer and dryer.
- **Next Steps**
  - Begin permitting and bid for the expansion of the yard.
  - Bid the installation of the plumbing / electric.

7. Rotary Community Center Facility Improvements

- Replace the hardwood floor in the main area.
- **Next Steps**
  - Request bids for the replacement of the new floor.

8. Watershed Management Facility Improvements

- Remove the carpet and install new flooring in the rear office space.
- **Next Steps**
  - Request quotes on completing the new flooring in the office.

DIVISION/STAFF UPDATES

Project Management

Thirty-five (35) CIP projects are currently in progress. Don Ryan Center, Veteran Memorial, Buckwalter Park and BIS Phase 5 sidewalks, Wright Family Park and the Calhoun Street Dock have recently been completed. CIP projects including BIS Phase 5E sewer, and Pritchard Street sewer are currently under construction and nearing completion. The LEC Parking Expansion, BIS Phase 5A-D Sewer started construction in December 2020, and the Boundary Street Lighting projects is expected to start construction in March 2021. The remaining CIP projects are in the design phase and several are planned for construction in FY 2022.

Watershed Management

1. Southern Lowcountry Regional Board (SoLoCo)

a. Regional Southern Lowcountry Post Construction Stormwater Ordinance and Design Manual

- Via concurrence of the Mayor and direction by the Town Manager, staff has participated in the SoLoCo Technical Working Group to develop a regional stormwater model ordinance and design manual and investigate the viability of a regional stormwater authority.
- Beaufort County adopted the SoLoCo Stormwater ordinance and design manual and began implementation 2/1/21.
- 2/9/21 Town Council tabled the item until 4/13/21.
- **Next Steps**
  - 4/13/21 Town Council – Public Hearing and 2nd reading.
  - Anticipated implementation date of 5/1/21.

2. Sea Level Rise Task Force

- Following Beaufort County's presentation and request for regional participation at the 10/22/19 SoLoCo meeting, staff attended the Sea Level Rise Task Force meetings to discuss a possible No Fill Ordinance and county-wide sea level rise adaptation strategies.
- Task Force met 12/15/20 and 12/18/20 to prioritize recommendations for final document with strategies for local governments to implement policies, ordinances and projects to mitigate the potential impacts of sea level rise.
- **Next Steps**
  - Beaufort County to present and request a recommendation from SoLoCo for regional partners to adopt.

3. Joint Councils Meeting for Watershed Management Initiatives

- BJWSA developed their CIP list for FY 2020 sewer projects which does not include any projects in the County's jurisdiction in the May River Headwaters without cost-sharing.
- Following the Joint Councils Meeting with BJWSA, held on 2/25/20, staff from Beaufort County and Town of Bluffton met to discuss sewer extension scope and strategy on 2/27/20.
- Staff from the Town, County, and BJWSA met via Zoom 3/27/20 to confirm project scope, cost, and potential project manager. the last project cost estimate to extend, connect, and abandon septic in the Stoney Creek project area is $4.7 million (B. Chemsak email 7/22/19) but they anticipate those numbers increasing to $5.5 million. The proposal is 1/3 cost-share, so the Town's portion would be approximately $1.83 million. Beaufort County has not formally agreed or committed any funding.
- Neither BJWSA nor Beaufort County have committed funds in FY 2021 to begin sewer extension.
- Town Manager, Director of Engineering and staff met with BJWSA General Manager, Engineer and staff on 6/5/20 to discuss how to move the project forward.
- The Town submitted a response on 12/18/21 to BJWSA's "call for projects" request that prioritizes May River Watershed sewer projects.
- Staff drafted a letter for the Town Manager's review requesting Beaufort County commit to cost-sharing sewer projects in the May River watershed.
- **Next Steps**
  - Staff to present another update on current status at 4/13/21 Town Council meeting.

4. SC Department of Health and Environmental Control May River Shellfish Harvesting Monitoring Data Year-to-Date and May River Shellfish Harvesting Status Exhibit – Attachments 1 and 1a

5. May River Watershed Action Plan Implementation Summary - Attachment 2

6. Municipal Separate Storm Sewer System (MS4) Program Update

- Staff is currently updating the Town's MS4 Stormwater Management Plan and supporting documentation. SCDHEC is currently in the process of developing a revised National Pollutant Discharge and Elimination (NPDES) Permit for Small MS4s and will re-issue to permittees, including the Town, in the future.

7. MS4 Minimum Control Measure (MCM) - #1 Public Education and Outreach, and MS4 MCM - #2 Public Participation and Involvement

- Staff attended the Beaufort County Stormwater Utility Board meeting on 2/10/21.
- The May River Watershed Action Plan Advisory Committee met 2/25/21. **Attachment 3**
- Staff is working the Town Digital Communication Manager to promote a series of MS4 stormwater educational tips and reminders for the Bluffton community via the Town's Facebook page.
- Staff has tentatively set the date for the 2021 May River Cleanup for 5/01/21. Over the next several months, staff will be working to secure partnerships and coordinate this event if conditions allow it to be held.

8. MS4 MCM – #3 Illicit Discharge Detection and Elimination

- Stormwater Infrastructure Inventory Map - **Attachment 4a**
- *E. coli* Concentrations Trend Map - **Attachment 4b**
- Monthly, Microbial Source Tracking (MST) Maps - **Attachments 4c and 4d**
  - Town staff coordinates with the SC Department of Health and Environmental Control (SCDHEC) to pull MST samples concurrently with the state's routine shellfish harvesting water quality sampling at stations 19-19, 19-19A, 19-19B, 19-19C, and 19-24. SCDHEC will conduct sampling on 2/22/21. Staff will notify Council and Senior Staff of any pertinent findings from this sampling event via email.
  - Town staff collected seventeen (17) MST samples on 2/15/21 following approximately 2.19 inches of rainfall over seven (7) days. Staff will notify Council and Senior Staff of any pertinent findings from this sampling event via email.
- Illicit Discharge Investigations – **Attachment 4e**

9. MS4 MCM – #4 Construction Site Stormwater Runoff Control – Attachment 5

10. MS4 MCM – #5 Stormwater Plan Review and Related Activity – Attachment 6

11. MS4 MCM – #6 Good Housekeeping (Staff Training/Education)

- Town Staff attended a Beaufort County Staff training on 2/11/21 regarding SoLoCo implementation to maintain consistency between the jurisdictions for the new ordinance and design manual.
- Staff participated in a Sontek IQ-flow monitoring data training on 2/17/21.

12. Citizen Drainage, Maintenance, and Inspections Concerns Map – Attachment 7

13. Citizen Request for Watershed Management Services & Activities – Attachment 8

Public Works

1. MS4 MCM – #6 Good Housekeeping (Ditch, Drainage and Roadside Maintenance)

- Performed weekly street sweeping on Calhoun Street, Highway 46, Bruin Road, May River Road, Pin Oak Street, and curbs and medians on Simmonsville and Buck Island Roads.
- Performed ditch inspections
  - Arrow ditch (2,569 LF)
  - Red Cedar ditch (966 LF)
  - Buck Island roadside ditch (15,926 LF)
  - Simmonsville roadside ditch (13,792 LF)
- Ongoing roadside mowing, litter clean-up and maintenance of Masters' Way, McCracken Circle, Hampton Parkway, Buck Island and Simmonsville Roads, Goethe Road, Shults Road, Jason and Able Streets, Whispering Pine Road, May River Road and Eagles Field.
- Ongoing mowing of the New River side trail and field at New River barn.
- Beautification Program –Landscape Maintenance - ongoing routine.

2. Facilities

- Facilities and Parks Maintenance - ongoing routine.

3. Public Works Activities Report - Attachment 10

Attachments

1. SCDHEC Shellfish Harvesting Monitoring Data Year-to-Date
   a. SCDHEC May River Shellfish Harvesting Status Exhibit
2. May River Watershed Action Plan Implementation Summary*
3. MS4 Minimum Control Measures #1 and #2 – May River Watershed Action Plan Advisory Committee Cancelation Notice
4. MS4 Minimum Control Measure #3 – Illicit Discharge Detection and Elimination
   a. Stormwater Infrastructure Inventory Map
   b. *E. coli* Concentrations Trend Map
   c. Microbial Source Tracking Trend Map – Human Source
   d. Microbial Source Tracking Map – All Sources
   e. Illicit Discharge Investigations
5. MS4 Minimum Control Measure #4 – Construction Site Stormwater Runoff Control
6. MS4 Minimum Control Measure #5 – Stormwater Plan Review and Related Activity
7. Citizen Drainage, Maintenance and Inspections Concerns Map
8. Citizen Request for Watershed Management Services and Activities Map
9. Beautification Committee Agenda
10. Public Works Activities Report
11. CIP Project Schedules

* Attachment noted above includes the latest updates in bold and italic font.

SCDHEC Shellfish Harvesting Monitoring Data Year-to-Date
May River Headwaters Shellfish Stations

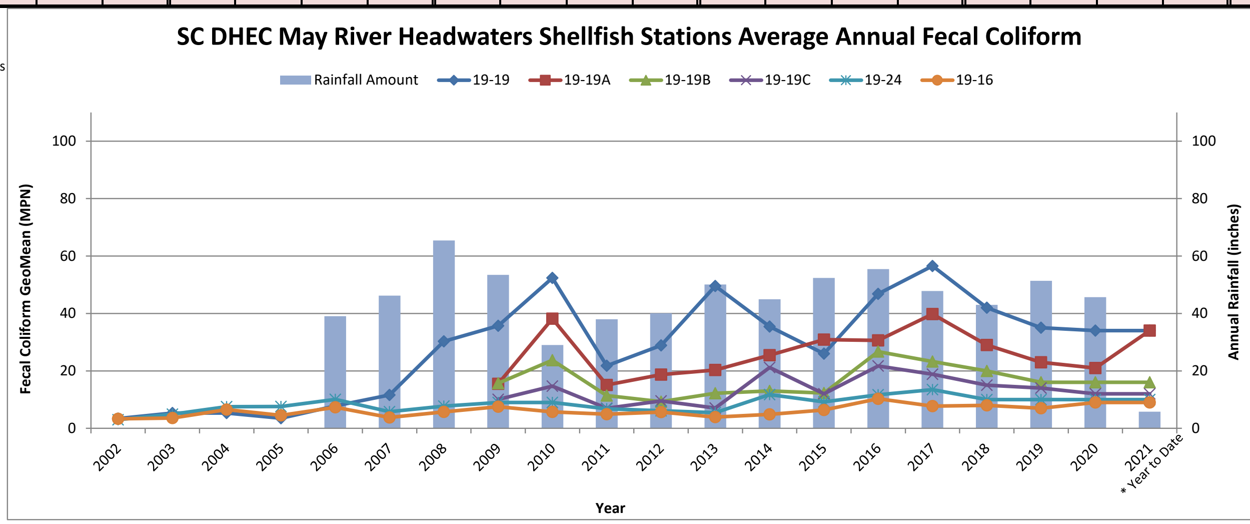
ATTACHMENT 1

	19-19				19-19A				19-19B				19-19C				19-24				19-16			
	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)	Fecal Coliform (MPN)
December	79.0	170.0	17.0		49.0	33.0	22.0		33.0	140.0	17.0		46.0	33.0	4.5		23.0	13.0	4.0		21.0	110.0	11.0	
November	49.0	17.0	70.0		13.0	6.8	31.0		23.0	7.8	17.0		17.0	11.0	13.0		17.0	4.5	13.0		7.8	2.0	4.5	
October	79.0	7.8	49.0		23.0	4.5	79.0		7.8	2.0	31.0		7.8	4.5	21.0		7.8	1.8	33.0		2.0	2.0	79.0	
September	49.0	79.0	110.0		23.0	33.0	49.0		13.0	6.8	49.0		17.0	17.0	33.0		17.0	4.5	33.0		17.0	1.8	33.0	
August	70.0	70.0	49.0		23.0	49.0	49.0		13.0	33.0	23.0		4.5	22.0	23.0		7.8	7.8	17.0		17.0	17.0	22.0	
July	23.0	4.5	33.0		33.0	13.0	13.0		11.0	7.8	23.0		7.8	17.0	7.8		13.0	22.0	7.8		4.5	13.0	17.0	
June	11.0	33.0	NS		23.0	49.0	NS		23.0	49.0	NS		7.8	46.0	NS		4.5	13.0	NS		1.8	4.5	NS	
May	17.0	7.8	70.0		33.0	9.2	49.0		17.0	7.8	23.0		13.0	2.0	22.0		23.0	6.8	6.8		13.0	4.5	4.5	
April	33.0	23.0	33.0		13.0	13.0	33.0		17.0	7.8	13.0		17.0	6.8	6.8		49.0	23.0	13.0		17.0	6.8	13.0	
March	22.0	23.0	170.0		21.0	23.0	49.0		4.5	6.8	130.0		11.0	13.0	49.0		7.8	7.8	70.0		9.3	4.5	33.0	
February	17.0	64.0	17.0		7.8	33.0	7.8		17.0	23.0	21.0		17.0	31.0	4.5		2.0	6.8	4.5		7.8	13.0	6.8	
January	13.0	23.0	95.0	17.0	2.0	23.0	33.0	17.0	4.5	13.0	33.0	13.0	2.0	33.0	17.0	23.0	1.8	7.8	17.0	17.0	4.5	23.0	17.0	13.0
Additional Samples																								
Additional Samples																								
Average Annual GeoMean	30.8	26.4	51.4	17.0	17.5	19.0	31.9	17.0	13.1	13.0	27.3	13.0	10.7	14.5	14.0	23.0	9.8	8.0	13.8	17.0	7.9	7.5	15.3	13.0
** Truncated GeoMetric Mean	42.0	35.0	34.0	34.0	29.0	23.0	21.0	34.0	20.0	16.0	16.0	16.0	15.0	14.0	12.0	12.0	10.0	10.0	10.0	10.0	8.0	7.0	9.0	9.0
** Truncated 90th Percentile	176.0	168.0	106.0	106.0	115.0	89.0	59.0	106.0	71.0	63.0	50.0	50.0	56.0	52.0	37.0	37.0	44.0	38.0	31.0	31.0	30.0	32.0	35.0	35.0

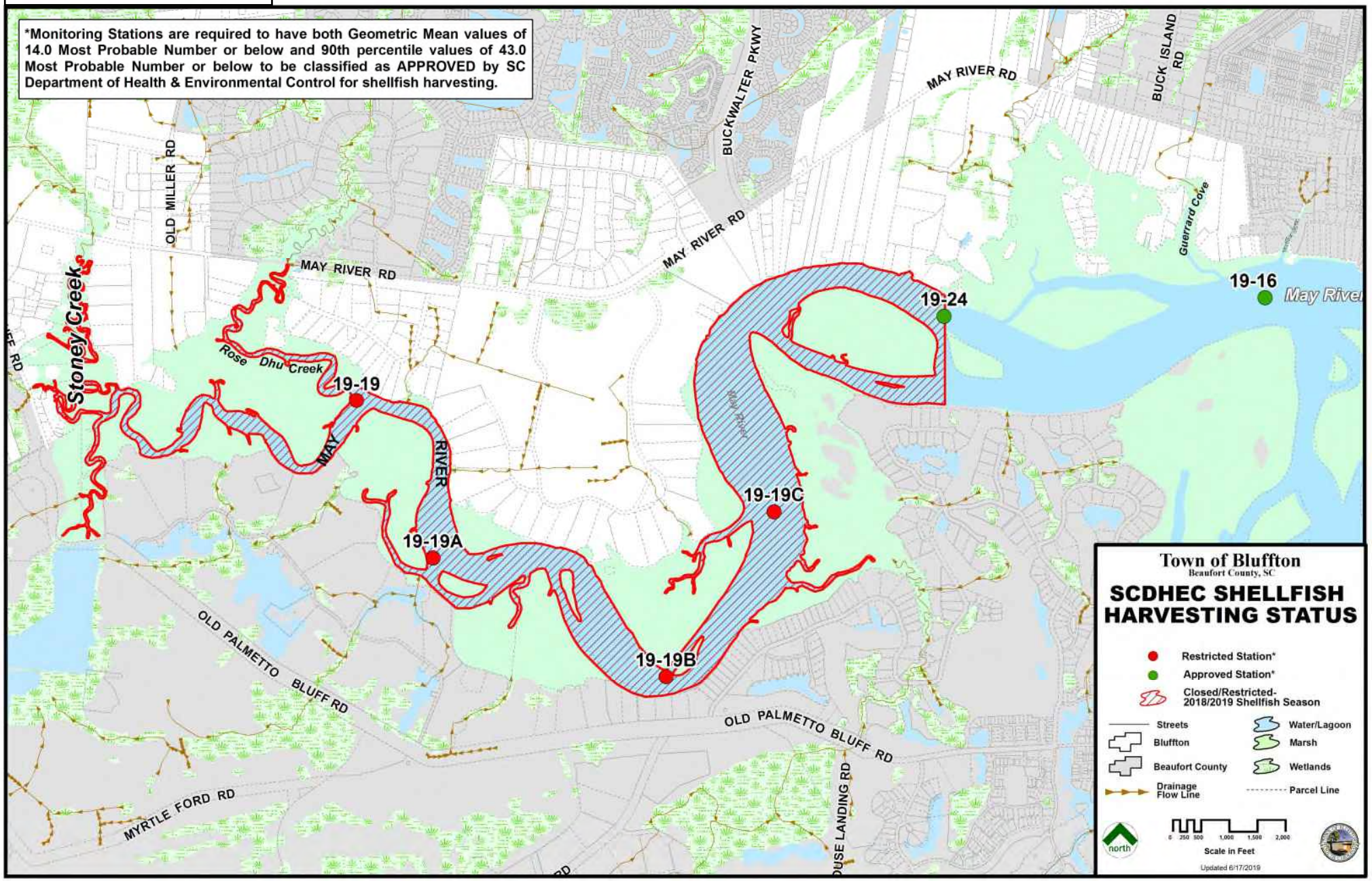
NS = No Sample

AS = Additional Samples

** Town staff calculations utilizing DHEC statistics



May River Headwaters



ACTIVITY - FINANCIAL	STATUS
Funding Opportunities	Council unanimously adopted $115 SWU Fee and NPDES-related Fees on 6/9/20.
ACTIVITY - POLICIES	**STATUS**
Sewer Connection & Extension Policy	*Completed 2017.*
Septic to Sewer Conversion Program	*Completed 2018.*
Sewer Connection Ordinance and Ordinance Amendment	*Completed 2015 and 2018, respectively.*
Southern Lowcountry Regional Stormwater Ordinance and Design Manual	***Current project updates are included in Engineering Consent Agenda under "Southern Lowcountry Regional Board (SoLoCo)."***
ACTIVITY - PROJECTS	**STATUS**
Sanitary Sewer Extension	Completed Buck Island/Simmonsville Road (BIS) Phases I, II, III, IV; Toy Fields; Jason/Able; and Poseys Court. Six project phases of Historic District sewer extension are proposed in the 5-year Capital Improvement Program. ***Current project updates are included in Engineering Consent Agenda under "Sewer & Water."***
May River 319 Grant Phase 1 - New Riverside Pond (Grant award of $483,500 in 2009)	*Completed 2013.*
May River 319 Grant Phase 2 - Pine Ridge (Grant award of $290,000 in 2011)	*Completed 2016.*
May River 319 Grant Phase 3 - Town Hall Parking Retrofit (Grant award of $231,350 in 2016)	*Completed 2019*.
May River 319 Grant Phase 4 - Sanitary Sewer Connections (Grant award of $365,558.36 in 2019)	Grant to construct 49 sewer lateral connections in Poseys Court, Little Aaron and Historic District Phases 1 and 2. ***Current project updates are included in Engineering Consent Agenda under "Sewer & Water."***
May River 319 Grant Phase 5 - Bridge Street Streetscape (Grant award of $179,900 in 2020)	Supports enhanced drainage and water quality improvements as part of the Bridge Street Streetscape project. ***Current project updates are included in Engineering Consent Agenda under "Pathways."***
Stoney Creek Wetlands Restoration: Preliminary Design Phase	Project on hold following Council direction on 5/31/17.
May River Watershed Action Plan Update & Modeling Report	*Completed 2021.* ***Town Council adoption of document as a supporting document to the Comprehensive Plan on 2/9/21.***
ACTIVITY - PROGRAMS	**STATUS**
Public Outreach/Participation/Involvement (MS4 Minimum Control Measures #1 & 2)	Outreach and involvement efforts continue through county-wide partnership with Carolina Clear as Lowcountry Stormwater Partners - Neighbors for Clean Water, through local cleanups, civic group presentations, and the May River Watershed Action Plan Advisory Committee. ***Current updates are included in Engineering Consent Agenda and Attachment 3.***
Infrastructure Mapping/GIS (MS4 Minimum Control Measure #3)	Data points continue to be collected with new development to meet MS4 requirements & populate water quality model. ***Current updates are included in Engineering Consent Agenda Attachment 4a.***
Water Quality Monitoring Program (MS4 Minimum Control Measure #3)	1. SCDHEC Shellfish monitoring results and map 2. *E. coli* bacteria "hot spot" concentrations 3. Microbial Source Tracking of bacteria 4. Illicit Discharge investigation and monitoring 5. BMP efficacy monitoring 6. MS4 monitoring ***Current updates are included in Engineering Consent Agenda Attachments 1, 1a, 4b - 4d.***

ACTIVITY - PROGRAMS continued	STATUS continued
Illicit Discharge Detection & Elimination (IDDE) Program (MS4 Minimum Control Measure #3)	Response to reported and observed non-stormwater discharges to the stormwater drainage system. ***Current updates are included in Engineering Consent Agenda Attachment 4e.***
Construction Site Stormwater Runoff Control Program (MS4 Minimum Control Measure #4)	Sediment and erosion control inspections with escalating enforcement response. ***Current updates are included in Engineering Consent Agenda Attachment 5.***
Stormwater Plan Review & Related Activity Program (MS4 Minimum Control Measure #5)	SCDHEC delegated plan review-related activities. ***Current updates are included in Engineering Consent Agenda Attachment 6.***
Ditch Inspection/Maintenance Program (MS4 Minimum Control Measure #6)	Continued coordination with SCDOT, Beaufort County and Town Public Works to inspect and maintain ditches within the Town's jurisdiction. ***Current updates are included in Engineering Consent Agenda Attachment 7.***
Neighborhood Assistance Program - Septic System Maintenance Program	On-going assistance offered to Town residents regardless of financial status through Neighborhood Assistance Program (NAP). ***Current updates are provided in Growth Management Consent Agenda.***

May River Watershed Action Plan Advisory Committee Meeting

Tuesday, February 25, 2021 at 9:00 AM

Electronic Meeting

AGENDA

This meeting can be viewed on the Town of Bluffton's Facebook page

PUBLIC COMMENT

*Public comments will be received via conference line provided by the Stormwater Coordinator. All requests for public comment will be accepted up to close of business (5:30 PM) the day prior to the scheduled meeting start time. Public Comments may be submitted electronically via the Town's website at https://www.townofbluffton.sc.gov/FormCenter/Town-15/Public-Comment-60 or to the Stormwater Coordinator at ldelhomme@townofbluffton.com.

I. Call to Order

II. Notice Regarding Posting of Meeting per South Carolina Freedom of Information (FOIA) Requirements

III. Roll Call and Confirmation of Quorum

IV. Adoption of the Agenda

V. Adoption of the Minutes

1. Meeting Minutes of January 21, 2021

VI. Presentations, Celebrations and Recognitions

1. Lowcountry Stormwater Partners – Ellen Comeau, Water Resources Agent, Clemson Extension

VII. Public Comment

VIII. Old Business

1. Water Quality Monitoring Program (Standing Item) – Beth Lewis, Water Quality Program Administrator
    a. Monthly Sampling Update
    b. Microbial Source Tracking (MST) Update
    c. SCDHEC Shellfish Data Update

IX. Discussion

X. Adjournment

NEXT MEETING DATE: 9:00 AM, Thursday, March 25, 2021

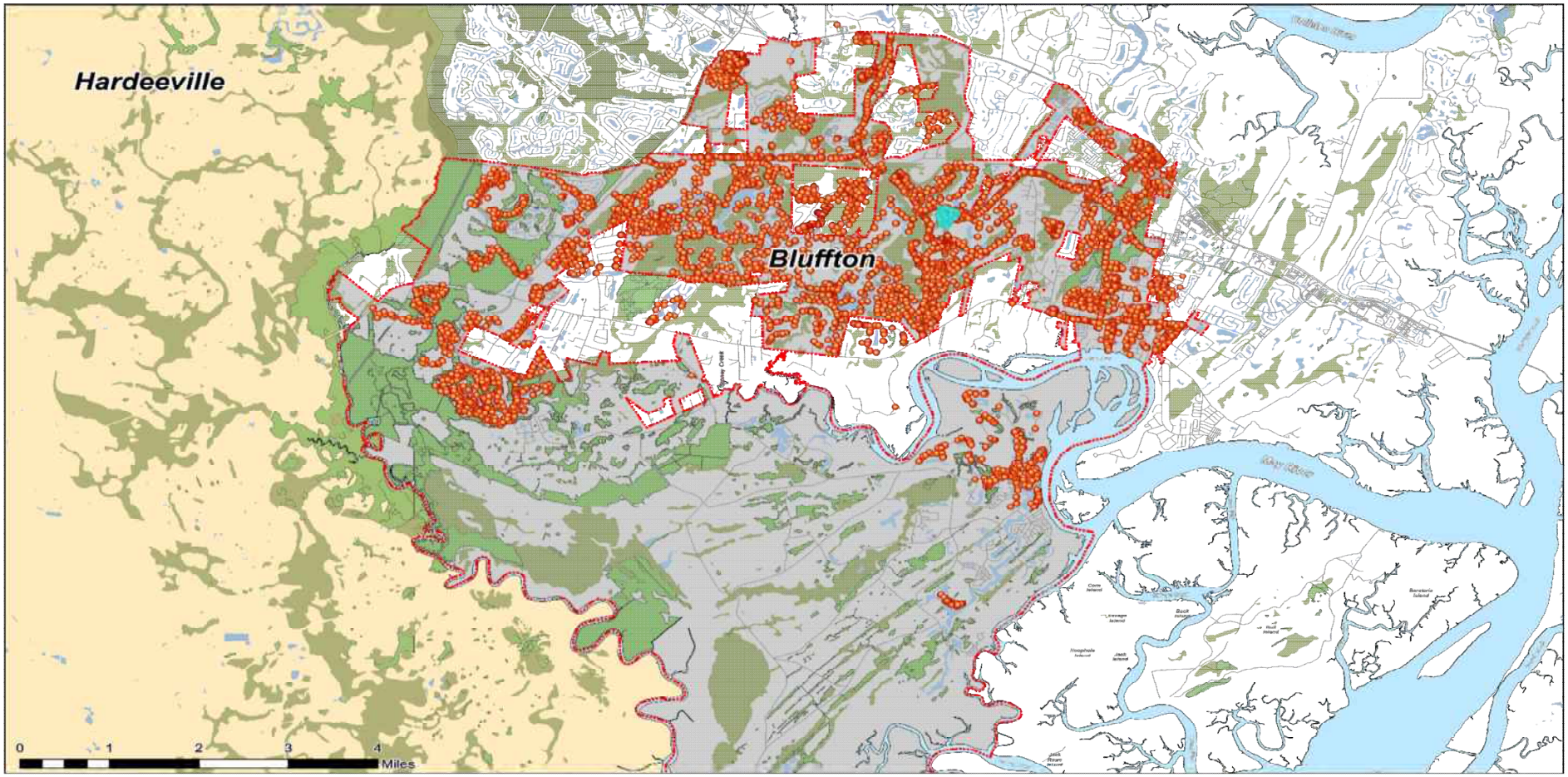
"FOIA Compliance – Public notification of this meeting has been published and posted in compliance with the Freedom of Information Act and the Town of Bluffton policies."

In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990 ("ADA"), the Town of Bluffton will not discriminate against qualified individuals with disabilities on the basis of disability in its services, programs, or activities. The Town of Bluffton Council Chambers are ADA compatible. Any person requiring further accommodation should contact the Town of Bluffton ADA Coordinator at 843.706.4500 or adacoordinator@townofbluffton.com as soon as possible but no later than 48 hours before the scheduled event.

**Please note that each member of the public may speak at public comment session and a form must be filled out and given to Town Staff. Public comment must not exceed three (3) minutes.*

ATTACHMENT 4a

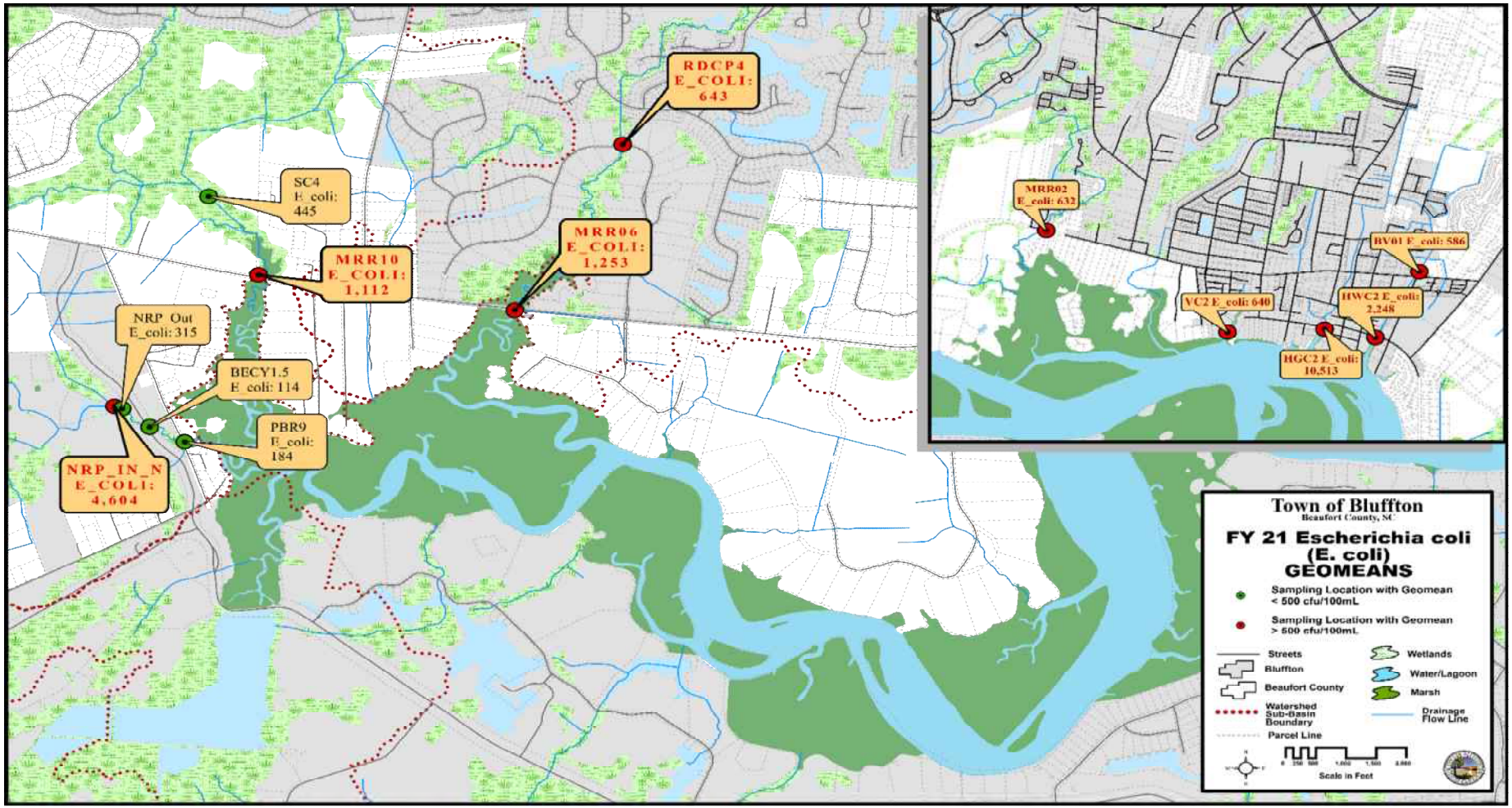
MS4 Minimum Control Measure #3 – IDDE (Illicit Discharge Detection & Elimination): Stormwater Infrastructure Inventory



Stormwater Infrastructure Inventory Collection Status	
FY 2021 YTD Collection Totals	992
FY 2020 Collection Totals	4,878
FY 2019 Collection Totals	2,925
FY 2018 Collection Totals	3,777

ATTACHMENT 4b

MS4 Minimum Control Measure #3 – IDDE: *E. coli* Concentrations Trend Map



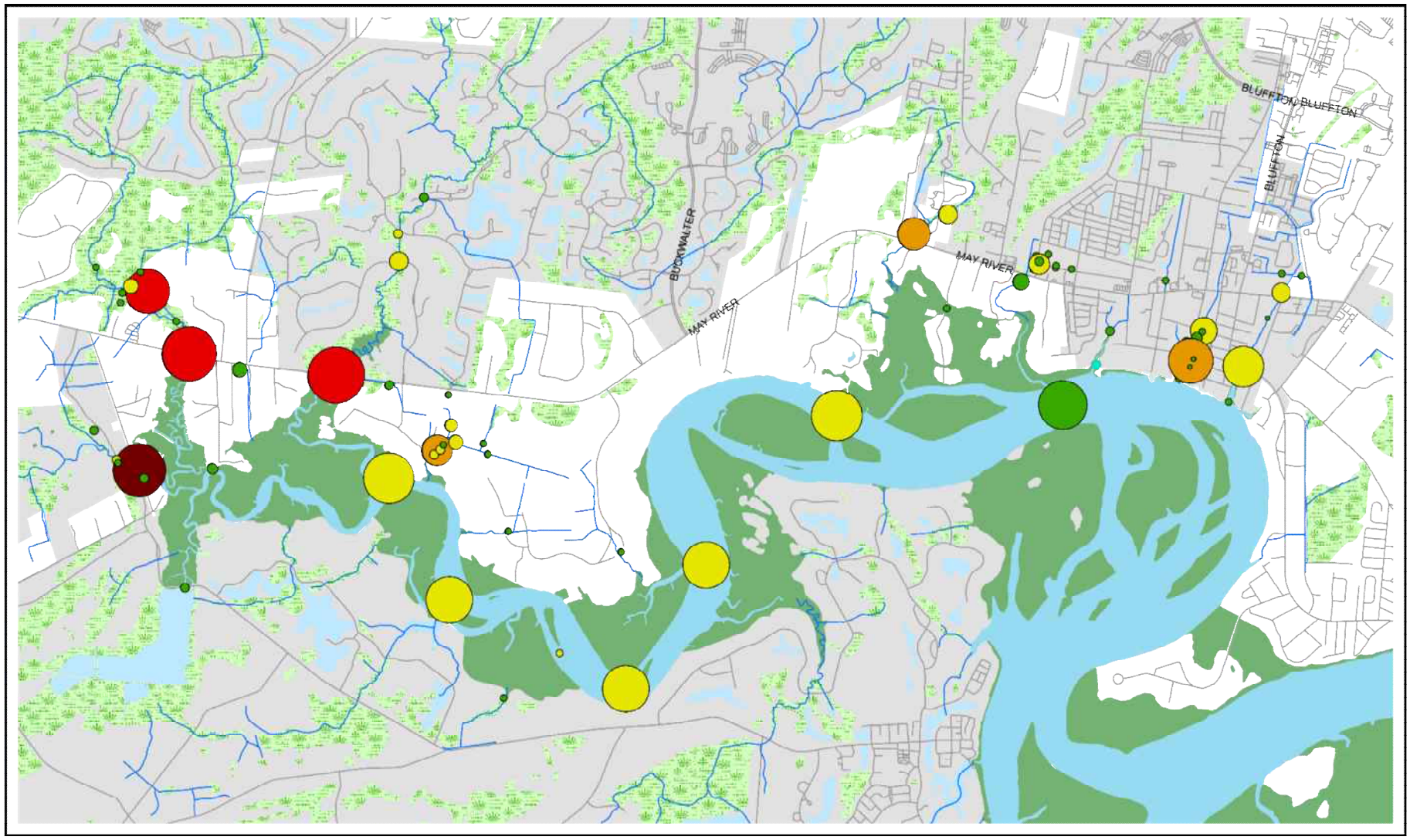
E coliform geomeans updated as of: 1/19/2021

	USCB Water Quality Samples	Microbial Source Tracking Samples	MS4 Quarterly Samples Collected
FY 2021 YTD Totals	277	70	95
FY 2020 Totals	223	115	123
FY 2019 Totals	280	193	264
FY 2018 Totals	216	217	224

- MST program began November 2016; MS4 Quarterly Sampling initiated 2/2017
- Totals include only samples submitted for laboratory analysis, and not *in situ* parameters.

ATTACHMENT 4c

MS4 Minimum Control Measure #3 – IDDE: Microbial Source Tracking (MST) Trend Map – Human Source



Town Jurisdiction
Beaufort County
Drainage Flow Lines

Positive Hits
0 1-3 3-6 6-9 >10

Times Sampled
1 - 3 4 - 6 7 - 10 >10

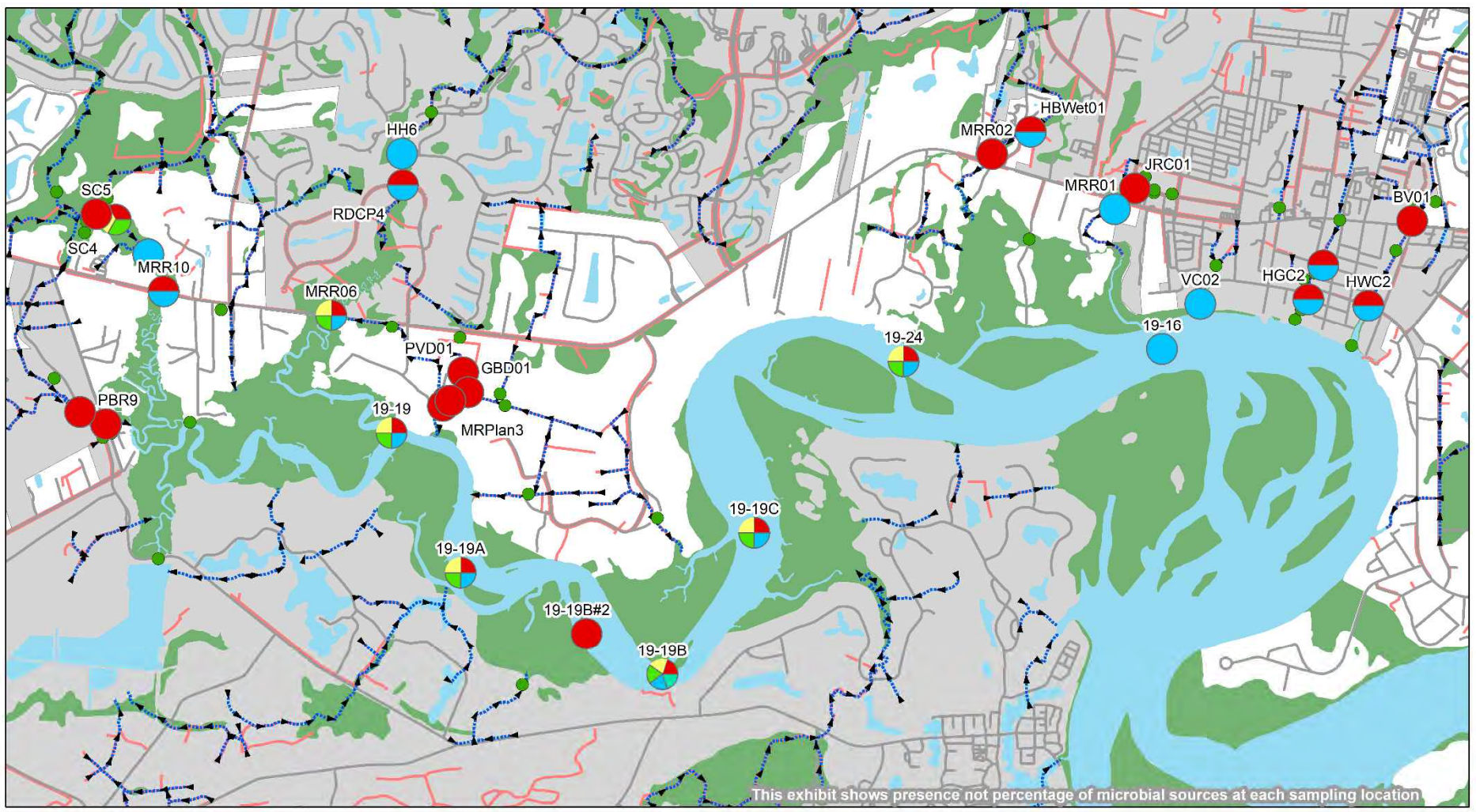
Size of dot correlates to # of times the site has been sampled.

Updated Date: 1/19/2021

N W E S

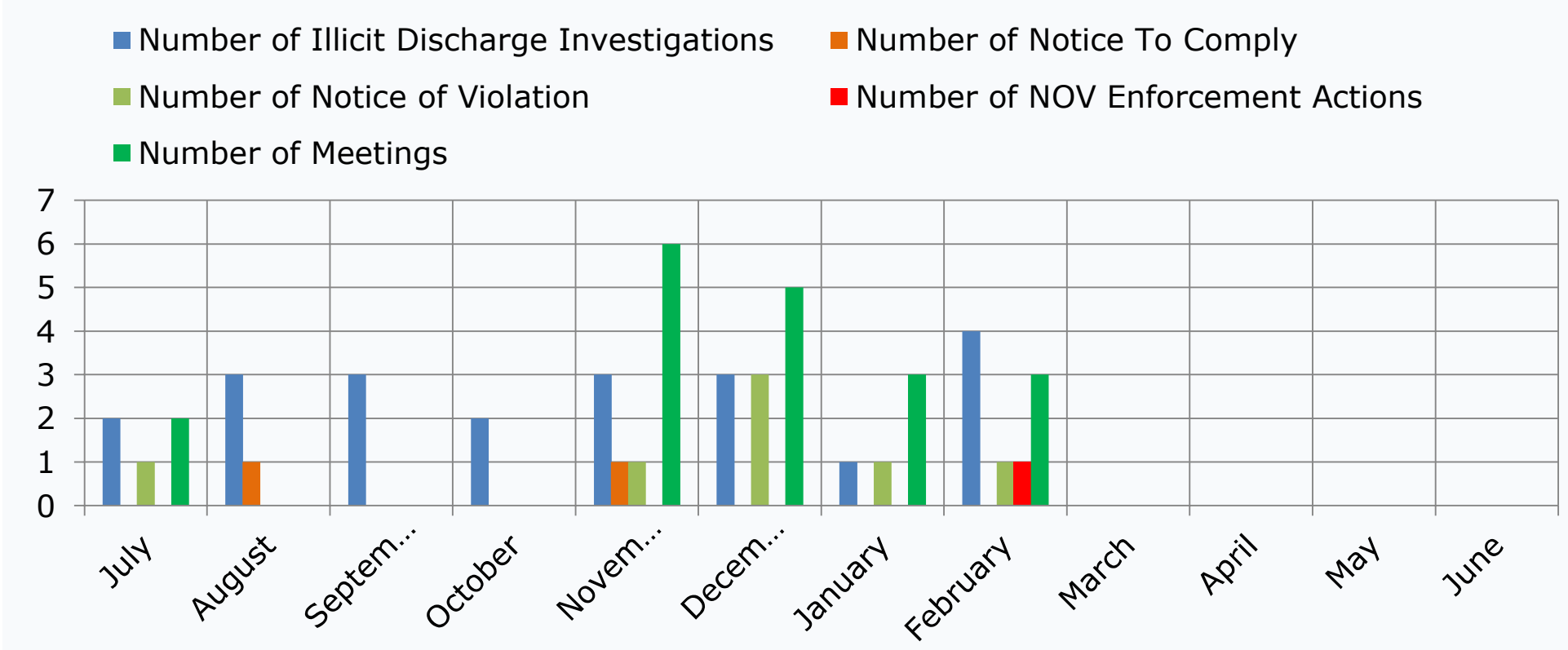
ATTACHMENT 4d

MS4 Minimum Control Measure #3 – IDDE:
Microbial Source Tracking (MST) Map – All Sources



ATTACHMENT 4e

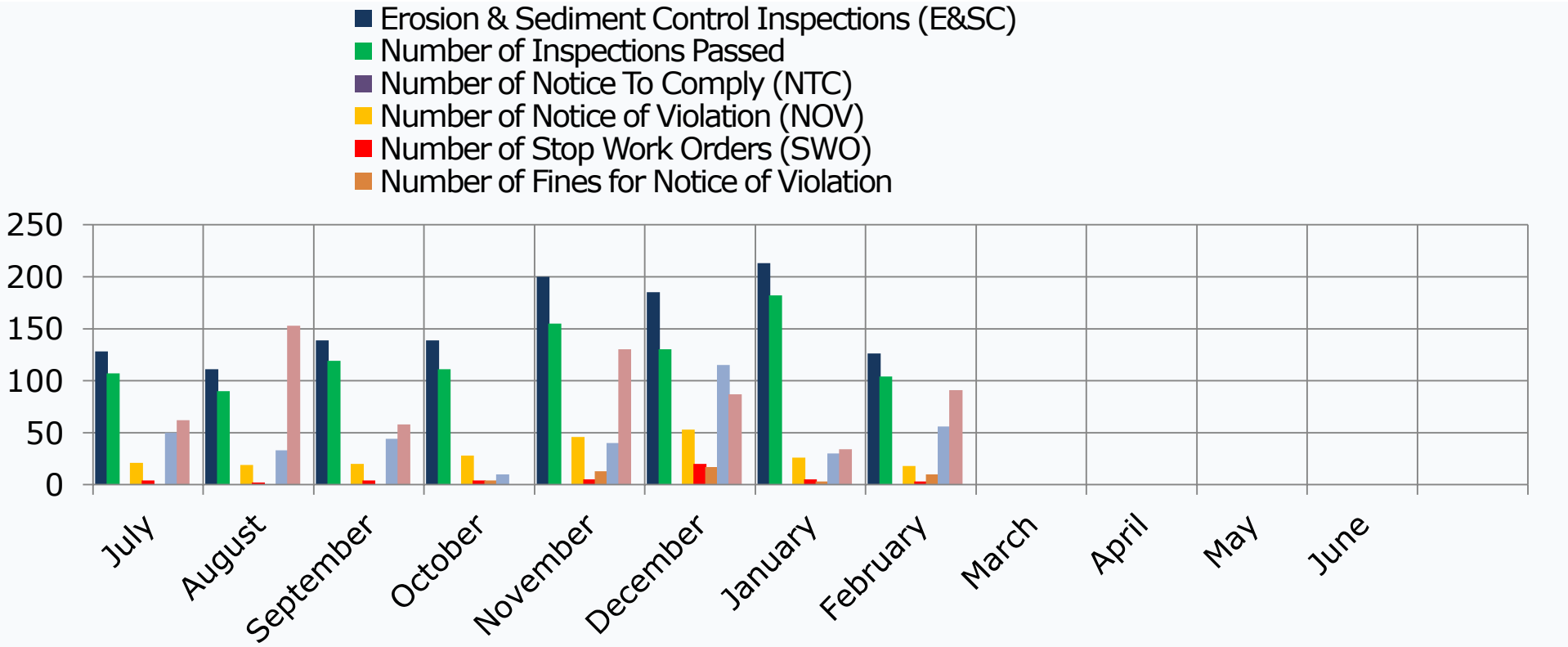
MS4 Minimum Control Measure #3 – IDDE: Illicit Discharge Investigations



	Number of Illicit Discharge Investigations	Number of Notices To Comply Issued	Number of Notices of Violation Issued	Number of NOV Enforcement Actions	Number of Meetings
FY 2021 YTD Totals	21	2	7	1	19
FY 2020 Totals	45	10	8	6	49
FY 2019 Totals	38	20	3	1	61
FY 2018 Totals	48	20	4	2	60

ATTACHMENT 5

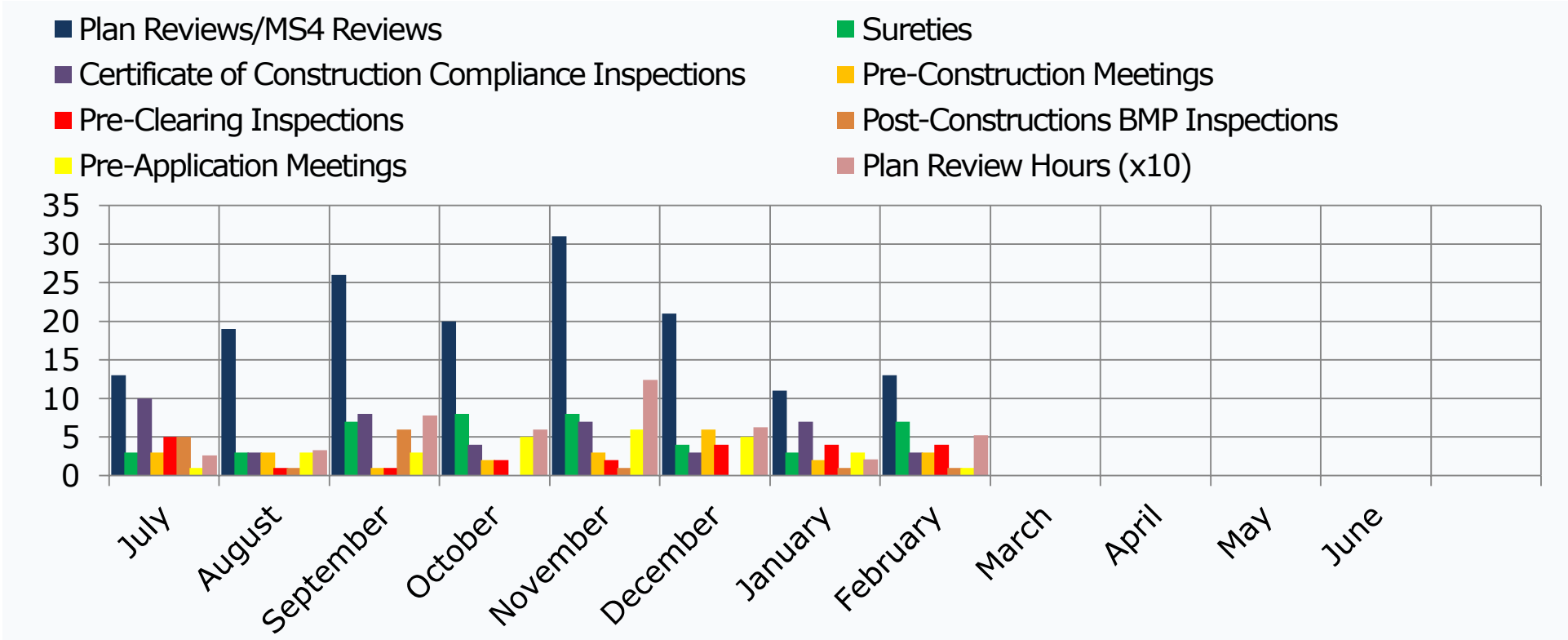
MS4 Minimum Control Measure #4 - Construction Site Stormwater Runoff Control



	Number of Sediment & Erosion Control Inspections	Number of Inspections Passed	Number of NTC Issued	Number of NOVs Issued	Number of SWO Issued	Number of NOV Enforcement Actions	Number of E&SC Meetings
FY 2021 YTD Totals	1224	1016	N/A	197	28	30	304
FY 2020 Totals	1,517	1187	128	185	16	9	496
FY 2019 Totals	1,688	1,384	254	72	N/A	7	403

ATTACHMENT 6

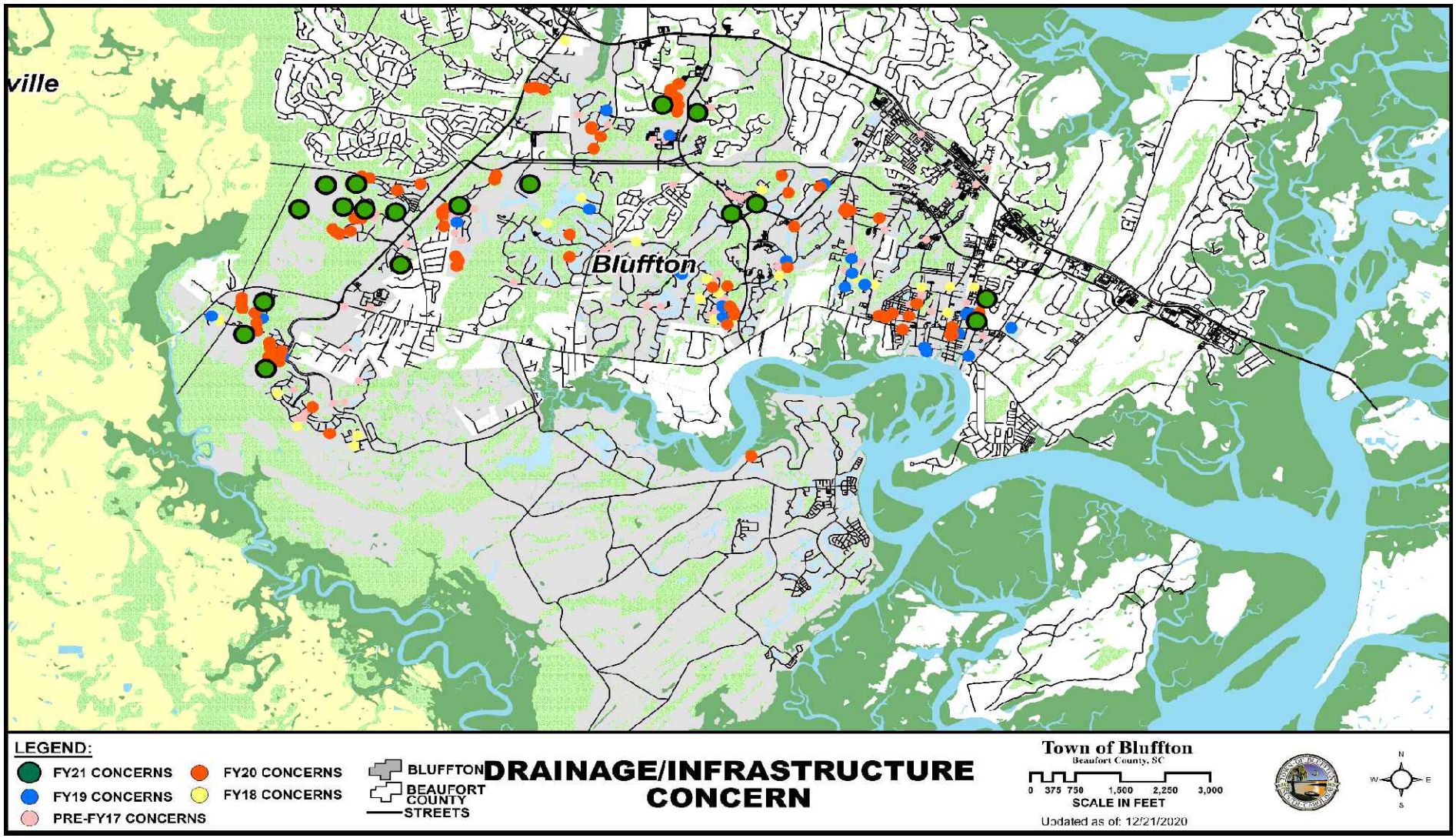
MS4 Minimum Control Measure #5
Stormwater Plan Review & Related Activity



	Plan Reviews MS4 Reviews	Sureties	Certificate of Construction Compliance Inspections	Pre-Construction Meetings	Pre-Clearing Inspections	Post Construction BMP Inspections	Pre-Application Meetings	Total Plan Review Hours
FY 2021 YTD Totals	120	32	39	13	15	14	21	394 Hrs.
FY 2020 Totals	176	53	46	36	17	8	36	789 Hrs.
FY 2019 Totals	208	52	53	47	37	27	63	1,040 Hrs.

ATTACHMENT 7

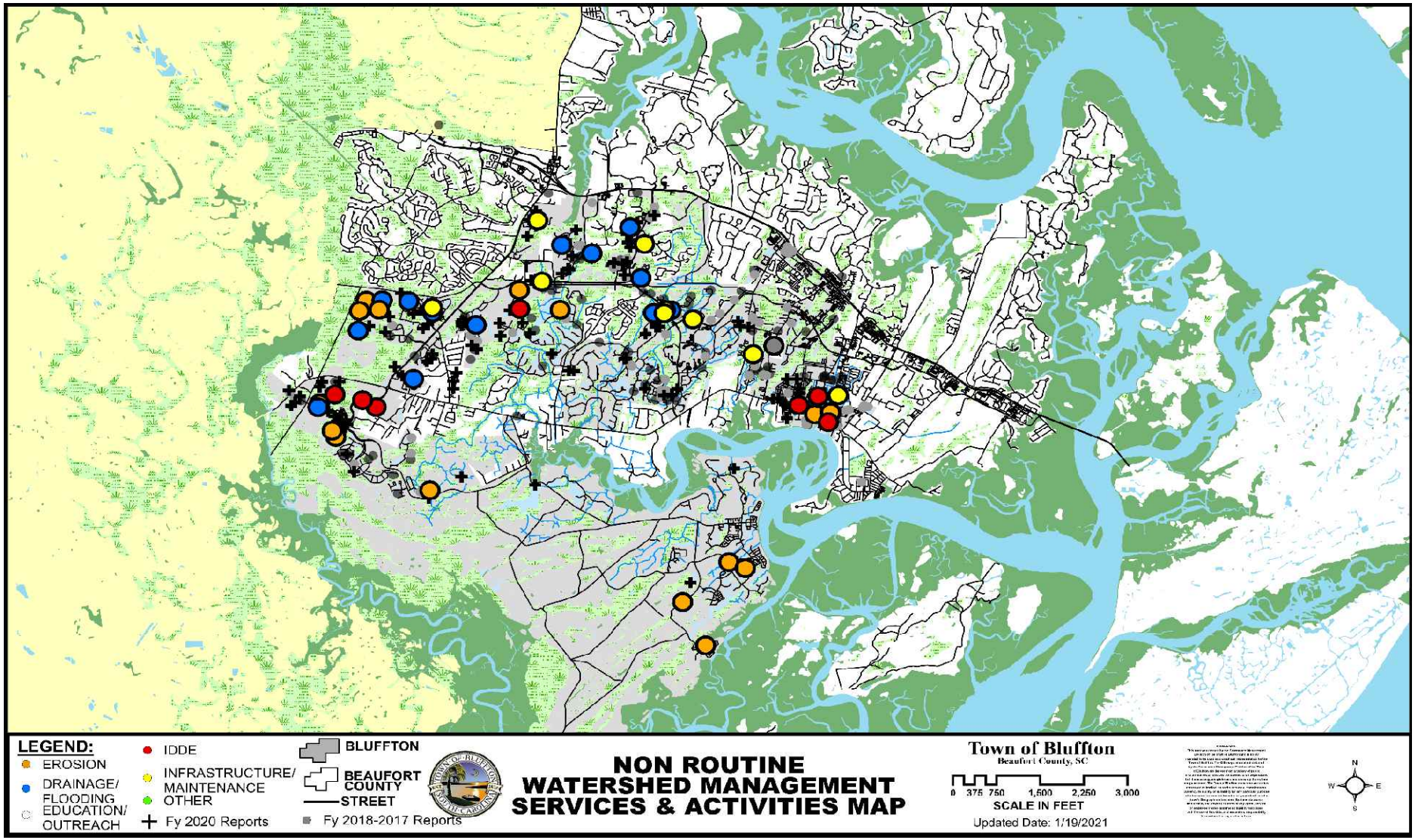
Citizen Drainage, Maintenance and Inspections Concerns Map



	Number of Drainage Concerns Investigated	Number of Meetings
FY 2021 YTD Totals	27	28
FY 2020 Totals	68	76
FY 2019 Totals	54	59

ATTACHMENT 8

Citizen Request for Watershed Mngt. Services & Activities Map



	Number of Citizen Requests Investigated	Number of Meetings
FY 2021 YTD Totals	31	30
FY 2020 Totals	99	102
FY 2019 Totals	75	79

No Quorum

TOWN OF BLUFFTON
BEAUTIFICATION COMMITTEE MEETING AGENDA

ELECTRONIC MEETING

Thursday, February 18, 2021, 10:00 a.m.

This meeting can be viewed on the Town of Bluffton's Facebook page starting at 1:00 p.m.
https://www.facebook.com/TownBlufftonSC/

I. CALL TO ORDER

II. ROLL CALL

III. ADOPTION OF THE AGENDA

IV. ADOPTION OF MINUTES – February 20, 2020

V. PUBLIC COMMENTS*

VI. OLD BUSINESS

VII. NEW BUSINESS

1. Introduction of New Beautification Committee Member – Michael Salas
2. Election of Officers
3. Adoption of 2021 Meeting Dates
4. Review and Approve Beautification Work Plan for FY 2022 Budget
5. Update on Power Line Trimming
6. Review Bench/Tree Memorial Program
7. Discuss Special Project for FY 2021 – Receptacles
8. Arbor Day Ceremony – Tree Planting Location

VIII. DISCUSSION

1. Wright Family Park Camellia Garden

IX. ADJOURNMENT

NEXT MEETING DATE: Thursday, March 18, 2021

* Public Comments may be submitted electronically via the Town's website at (https://bit.ly/TOBPublicComment) or by emailing your comments to the Engineering and Public Works Coordinator at rrexrode@townofbluffton.com. Comments will be accepted up to 2 hours prior to the scheduled meeting start time. All comments will be read aloud for the record and will be provided to the Development Review Committee.

FOIA COMPLIANCE – Public notification of this meeting has been published and posted in compliance with the Freedom of Information Act and the Town of Bluffton policies.

In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990 ("ADA"), the Town of Bluffton will not discriminate against qualified individuals with disabilities on the basis of disability in its services, programs, or activities. The Town of Bluffton Council Chambers are ADA compatible. Any person requiring further accommodation should contact the Town of Bluffton ADA Coordinator at 843.706.4500 or adacoordinator@townofbluffton.com as soon as possible but no later than 48 hours before the scheduled event.

Public Works Activities Report

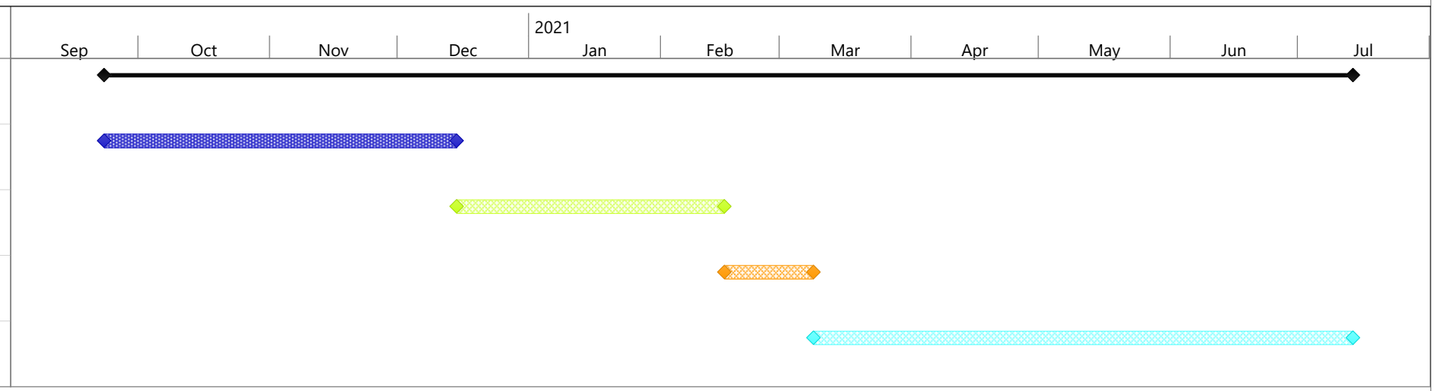
Week	# of Activities	Labor Cost	Equipment Cost	Other Cost	Total
FY21WK1	61	$4,397.00	$3,188.00		**$7,584.00**
FY21WK2	56	$5,474.00	$3,574.00	$121.00	**$9,168.00**
FY21WK3	48	$4,880.00	$3,502.00		**$8,382.00**
FY21WK4	62	$5,828.00	$3,970.00		**$9,799.00**
FY21WK5	45	$4,706.00	$3,575.00		**$8,281.00**
FY21WK6	54	$5,645.00	$3,114.00		**$9,126.00**
FY21WK7	60	$4,855.00	$4,232.00		**$9,087.00**
FY21WK8	67	$5,118.00	$4,221.00		**$9,339.00**
FY21WK9	50	$5,784.00	$3,923.00		**$9,707.00**
FY21WK10	54	$6,131.00	$4,248.00	$21.00	**$10,400.00**
FY21WK11	41	$4,677.00	$2,740.00		**$7,417.00**
FY21WK12	70	$5,580.00	$2,587.00	$326.00	**$8,494.00**
FY21WK13	94	$5,864.00	$5,084.00		**$10,949.00**
FY21WK14	49	$6,171.00	$4,261.00		**$10,431.00**
FY21WK15	53	$5,870.00	$4,059.00		**$9,929.00**
FY21WK16	62	$5,239.00	$3,531.00		**$8,771.00**
FY21WK17	77	$4,660.00	$3,769.00	$364.00	**$8,792.00**
FY21WK18	45	$4,679.00	$3,417.00		**$8,096.00**
FY21WK19	62	$6,186.00	$7,048.00		**$13,234.00**
FY21WK20	41	$4,135.00	$2,633.00		**$6,768.00**
FY21WK21	51	$5,446.00	$3,073.00		**$8,519.00**
FY21WK22	39	$3,229.00	$3,599.00		**$6,828.00**
FY21WK23	51	$5,072.00	$3,014.00		**$8,085.00**
FY21WK24	76	$6,073.00	$5,257.00		**$11,329.00**
FY21WK25	56	$4,245.00	$2,976.00		**$7,221.00**
FY21WK26	38	$1,890.00	$1,936.00		**$3,826.00**
FY21WK27	50	$4,417.00	$4,060.00		**$8,477.00**
FY21WK28	69	$5,753.00	$4,185.00		**$9,938.00**
FY21WK29	36	$4,703.00	$6,365.00		**$11,069.00**
FY21WK30	69	$5,100.00	$4,540.00		**$9,640.00**
FY21WK31	62	$5,581.00	$3,627.00		**$9,208.00**
FY21WK32	89	$5,648.00	$3,808.00		**$9,456.00**
FY21WK33	67	$4,845.00	$3,486.00		**$8,331.00**
FY21WK34					
FY21WK35					
FY21WK36					
FY21WK37					
FY21WK38					
FY21WK39					
FY21WK40					
FY21WK41					
FY21WK42					
FY21WK43					
FY21WK44					
FY21WK45					
FY21WK46					
FY21WK47					
FY21WK48					
FY21WK49					
FY21WK50					
FY21WK51					
FY21WK52					
Total	**1904**	**$167,881.00**	**$126,602.00**	**$832.00**	**$295,681.00**

Public Works Activities Report

Week	# of Activities	Labor Cost	Equipment Cost	Other Cost	Total
FY21WK1	61	$4,397.00	$3,188.00		**$7,584.00**
FY21WK2	56	$5,474.00	$3,574.00	$121.00	**$9,168.00**
FY21WK3	48	$4,880.00	$3,502.00		**$8,382.00**
FY21WK4	62	$5,828.00	$3,970.00		**$9,799.00**
FY21WK5	45	$4,706.00	$3,575.00		**$8,281.00**
FY21WK6	54	$5,645.00	$3,114.00		**$9,126.00**
FY21WK7	60	$4,855.00	$4,232.00		**$9,087.00**
FY21WK8	67	$5,118.00	$4,221.00		**$9,339.00**
FY21WK9	50	$5,784.00	$3,923.00		**$9,707.00**
FY21WK10	54	$6,131.00	$4,248.00	$21.00	**$10,400.00**
FY21WK11	41	$4,677.00	$2,740.00		**$7,417.00**
FY21WK12	70	$5,580.00	$2,587.00	$326.00	**$8,494.00**
FY21WK13	94	$5,864.00	$5,084.00		**$10,949.00**
FY21WK14	49	$6,171.00	$4,261.00		**$10,431.00**
FY21WK15	53	$5,870.00	$4,059.00		**$9,929.00**
FY21WK16	62	$5,239.00	$3,531.00		**$8,771.00**
FY21WK17	77	$4,660.00	$3,769.00	$364.00	**$8,792.00**
FY21WK18	45	$4,679.00	$3,417.00		**$8,096.00**
FY21WK19	62	$6,186.00	$7,048.00		**$13,234.00**
FY21WK20	41	$4,135.00	$2,633.00		**$6,768.00**
FY21WK21	51	$5,446.00	$3,073.00		**$8,519.00**
FY21WK22	39	$3,229.00	$3,599.00		**$6,828.00**
FY21WK23	51	$5,072.00	$3,014.00		**$8,085.00**
FY21WK24	76	$6,073.00	$5,257.00		**$11,329.00**
FY21WK25	56	$4,245.00	$2,976.00		**$7,221.00**
FY21WK26	38	$1,890.00	$1,936.00		**$3,826.00**
FY21WK27	50	$4,417.00	$4,060.00		**$8,477.00**
FY21WK28	69	$5,753.00	$4,185.00		**$9,938.00**
FY21WK29	36	$4,703.00	$6,365.00		**$11,069.00**
FY21WK30	69	$5,100.00	$4,540.00		**$9,640.00**
FY21WK31	62	$5,581.00	$3,627.00		**$9,208.00**
FY21WK32	89	$5,648.00	$3,808.00		**$9,456.00**
FY21WK33	67	$4,845.00	$3,486.00		**$8,331.00**
FY21WK34					
FY21WK35					
FY21WK36					
FY21WK37					
FY21WK38					
FY21WK39					
FY21WK40					
FY21WK41					
FY21WK42					
FY21WK43					
FY21WK44					
FY21WK45					
FY21WK46					
FY21WK47					
FY21WK48					
FY21WK49					
FY21WK50					
FY21WK51					
FY21WK52					
Total	**1904**	**$167,881.00**	**$126,602.00**	**$832.00**	**$295,681.00**

BUCKWALTER PLACE PARK RESTROOMS
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Buckwalter Place Park Restrooms**	**210 days**	**Wed 9/23/20**	**Tue 7/13/21**
2	**Planning and Conceptual Design**	**59 days**	**Wed 9/23/20**	**Mon 12/14/20**
7	**Final Design and Construction Documents**	**45 days**	**Tue 12/15/20**	**Mon 2/15/21**
10	**Permitting**	**15 days**	**Tue 2/16/21**	**Mon 3/8/21**
13	**Bidding and Contracts**	**91 days**	**Tue 3/9/21**	**Tue 7/13/21**

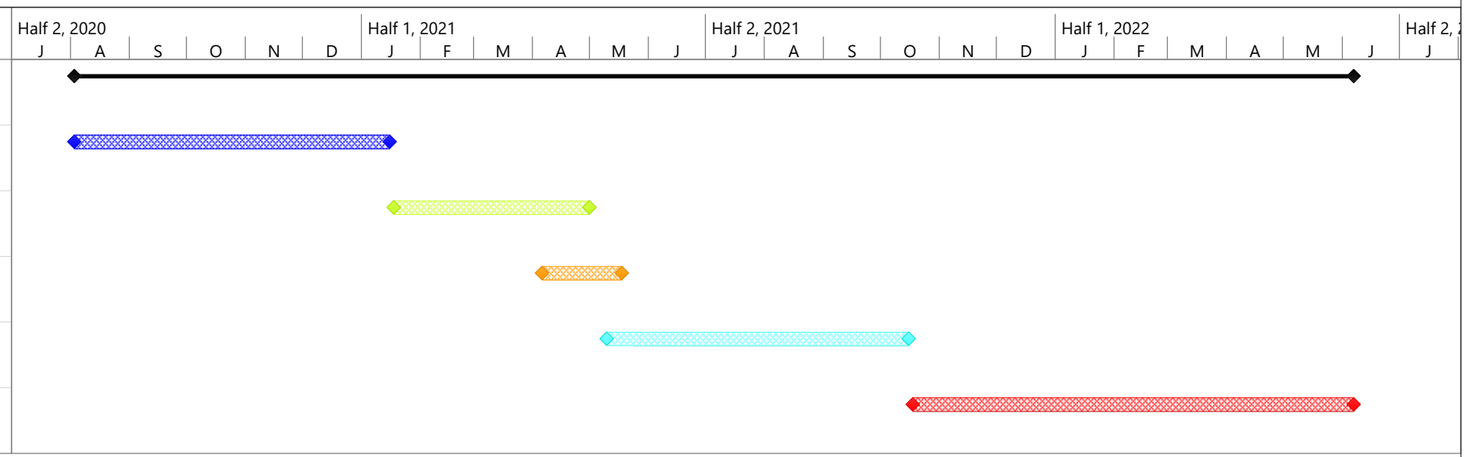


Project: 00040
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BUCKWALTER MULTI-COUNTY COMMERCE PARK
PHASE II DEVELOPMENT PARCEL - PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE II DEVELOPMENT PARCEL**	**481 days**	**Mon 8/3/20**	**Mon 6/6/22**
2	**Planning and Conceptual Design**	**120 days**	**Mon 8/3/20**	**Fri 1/15/21**
9	**Final Design and Construction Documents**	**75 days**	**Mon 1/18/21**	**Fri 4/30/21**
16	**Permitting**	**30 days**	**Tue 4/6/21**	**Mon 5/17/21**
21	**Bidding and Contracts**	**115 days**	**Mon 5/10/21**	**Fri 10/15/21**
32	**Construction**	**166 days**	**Mon 10/18/21**	**Mon 6/6/22**

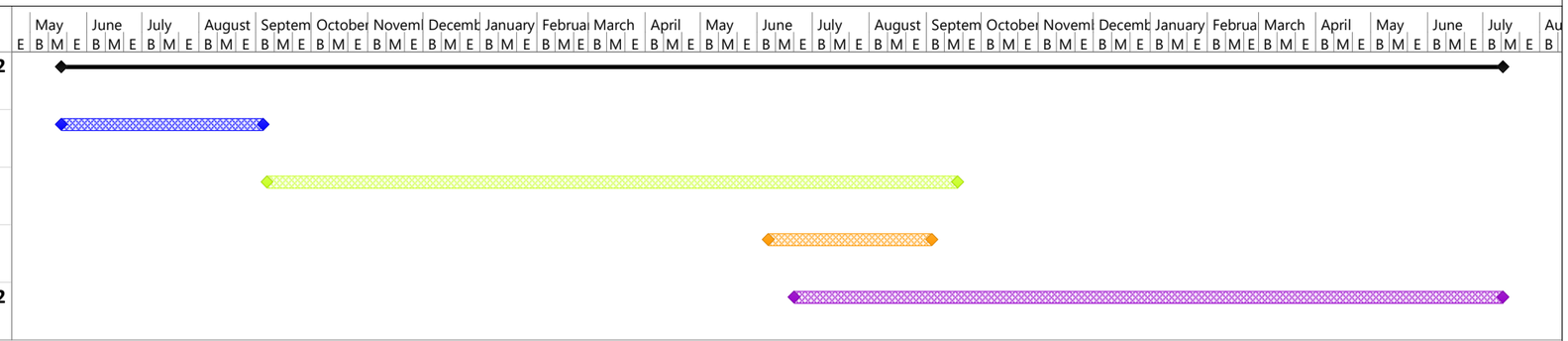


Project: 00040
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

CALHOUN STREET STREETSCAPE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**CALHOUN STREET STREETSCAPE**	**561 days**	**Mon 5/18/20**	**Mon 7/11/22**
2	**Planning and Conceptual Design**	**80 days**	**Mon 5/18/20**	**Fri 9/4/20**
7	**Final Planning and Construction Documents**	**270 days**	**Mon 9/7/20**	**Fri 9/17/21**
27	**Permitting Phase**	**65 days**	**Mon 6/7/21**	**Fri 9/3/21**
32	**Easements and Land Acquisition**	**276 days**	**Mon 6/21/21**	**Mon 7/11/22**

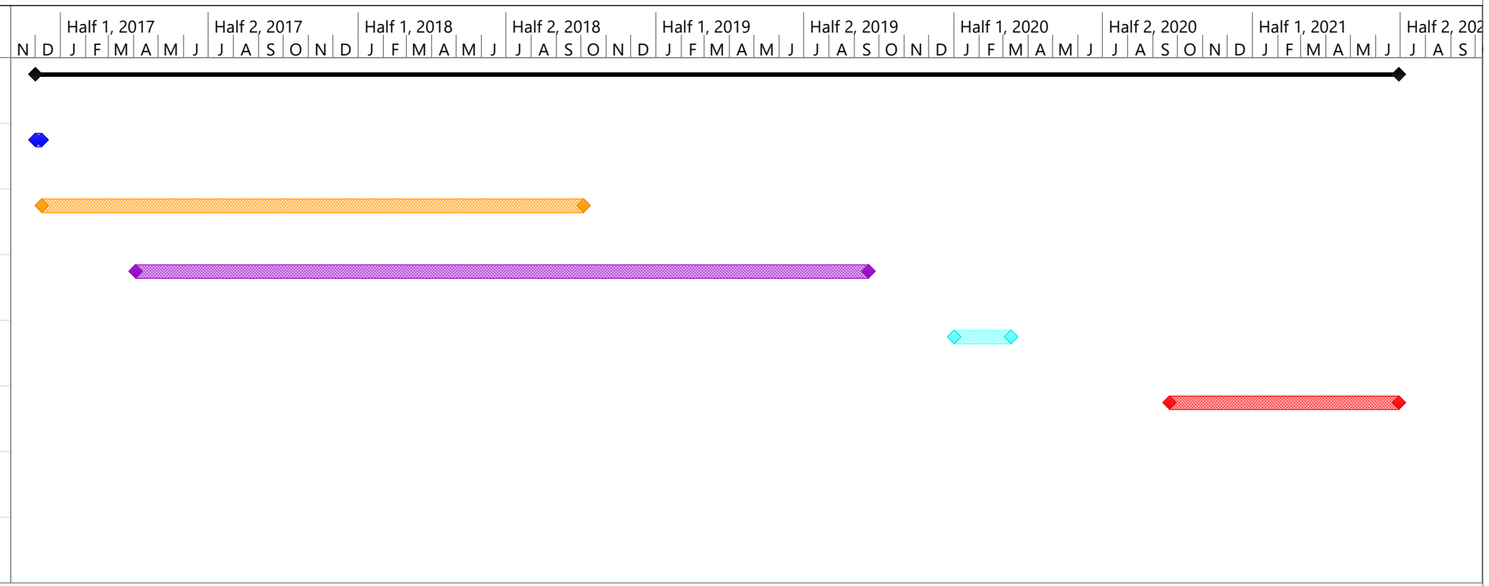


Project: 00042
Date: Wed 1/27/21

Milestone ◆ Task
Critical Task ★ Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction

BUCK ISLAND-SIMMONSVILLE SANITARY SEWER PHASE 5 A-D
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 5 A-D**	**1193 days?**	**Thu 12/1/16**	**Mon 6/28/21**
2	**Planning and Conceptual Design**	**6 days**	**Thu 12/1/16**	**Thu 12/8/16**
4	**Permitting**	**474 days**	**Fri 12/9/16**	**Wed 10/3/18**
11	**Easements and Land Acquisition**	**642 days**	**Mon 4/3/17**	**Tue 9/17/19**
16	**Bidding and Contracts**	**50 days**	**Wed 1/1/20**	**Tue 3/10/20**
21	**Construction**	**201 days**	**Mon 9/21/20**	**Mon 6/28/21**
29				
30				

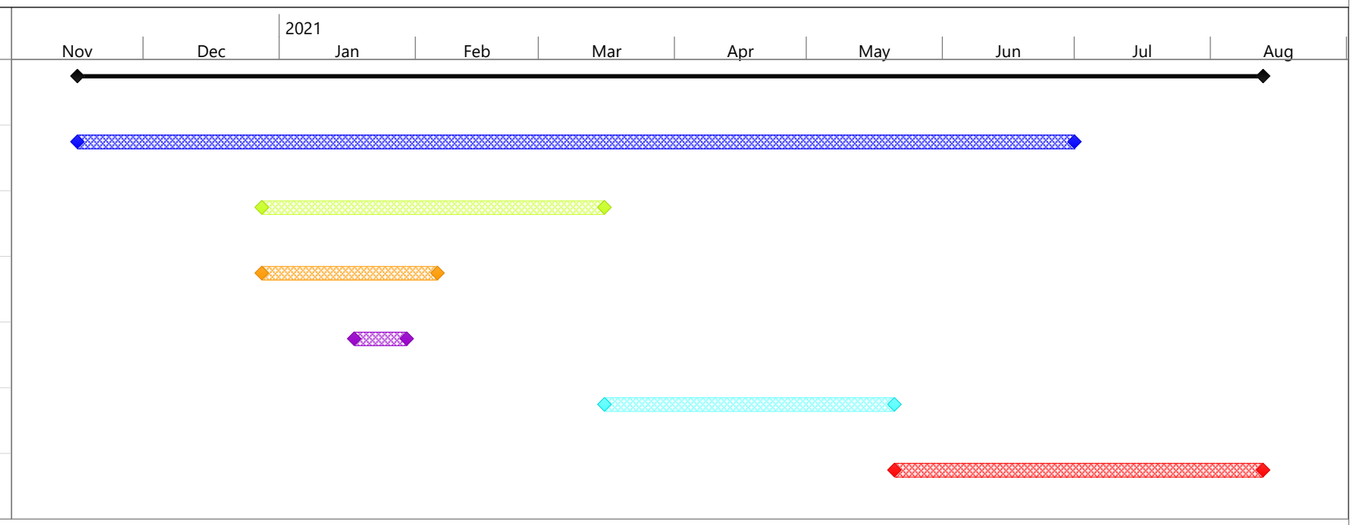


Project: 00044
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction

HISTORIC DISTRICT STREETSCAPE AND DRAINAGE IMPROVEMENTS PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Traffic Calming Study and AME Church Rain Garden**	**194 days**	**Mon 11/16/20**	**Thu 8/12/21**
2	**Planning and Conceptual Design**	**163 days**	**Mon 11/16/20**	**Wed 6/30/21**
7	**Final Design and Construction Documents**	**56 days**	**Mon 12/28/20**	**Mon 3/15/21**
10	**Permitting**	**30 days**	**Mon 12/28/20**	**Fri 2/5/21**
14	**Easements and Land Acquisition**	**10 days**	**Mon 1/18/21**	**Fri 1/29/21**
17	**Bidding and Contracts**	**48 days**	**Tue 3/16/21**	**Thu 5/20/21**
22	**Construction**	**60 days**	**Fri 5/21/21**	**Thu 8/12/21**

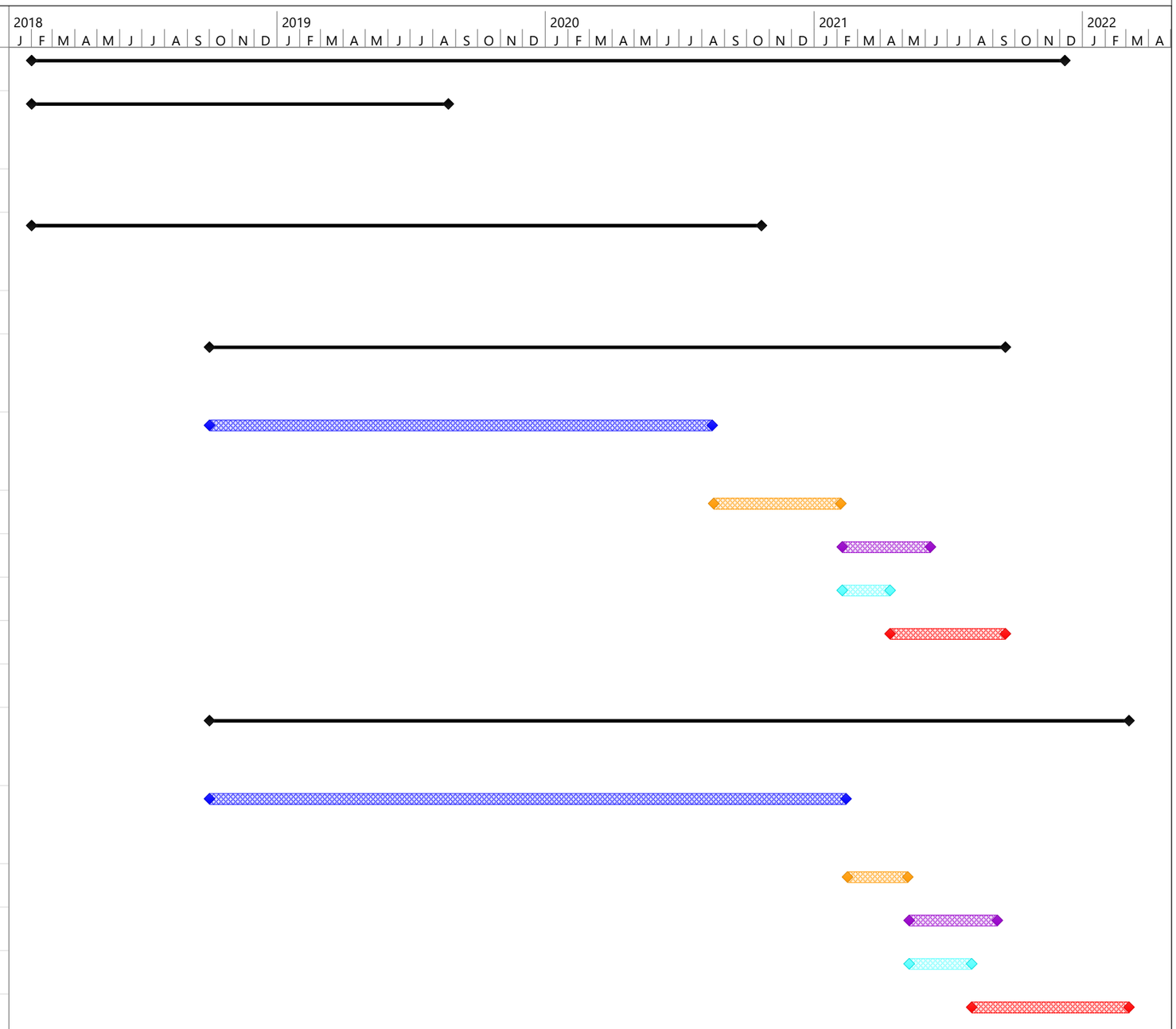


Project: 00050
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BUCK ISLAND-SIMMONSVILLE NEIGHBORHOOD SIDEWALKS
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**SIDEWALKS AND LIGHTING**	1004 days	Thu 2/1/18	Tue 12/7/21
2	**Sidewalk from Jennifer Ct to Simmonsville Rd**	**405 days**	**Thu 2/1/18**	**Wed 8/21/19**
26				
27	**Sidewalk from Kitty Road to 301 Buck Island Rd**	**709 days**	**Thu 2/1/18**	**Tue 10/20/20**
53				
54	**Sidewalk from Grayco to Sugaree (Simmonsville Rd)**	**775 days**	**Mon 10/1/18**	**Fri 9/17/21**
55	**Final Design and Construction Documents**	**490 days**	**Mon 10/1/18**	**Fri 8/14/20**
61	**Permitting**	**125 days**	**Mon 8/17/20**	**Fri 2/5/21**
63	**Easements**	**86 days**	**Mon 2/8/21**	**Mon 6/7/21**
68	**Bidding/Contract**	**47 days**	**Mon 2/8/21**	**Tue 4/13/21**
73	**Construction**	**113 days**	**Wed 4/14/21**	**Fri 9/17/21**
80				
81	**Sidewalk from Sugaree to Windy Lake (Simmonsville Rd)**	**895 days**	**Mon 10/1/18**	**Fri 3/4/22**
82	**Final Design and Construction Documents**	**620 days**	**Mon 10/1/18**	**Fri 2/12/21**
88	**Permitting**	**60 days**	**Mon 2/15/21**	**Fri 5/7/21**
90	**Easements**	**86 days**	**Mon 5/10/21**	**Mon 9/6/21**
95	**Bidding/Contract**	**61 days**	**Mon 5/10/21**	**Mon 8/2/21**
100	**Construction**	**154 days**	**Tue 8/3/21**	**Fri 3/4/22**

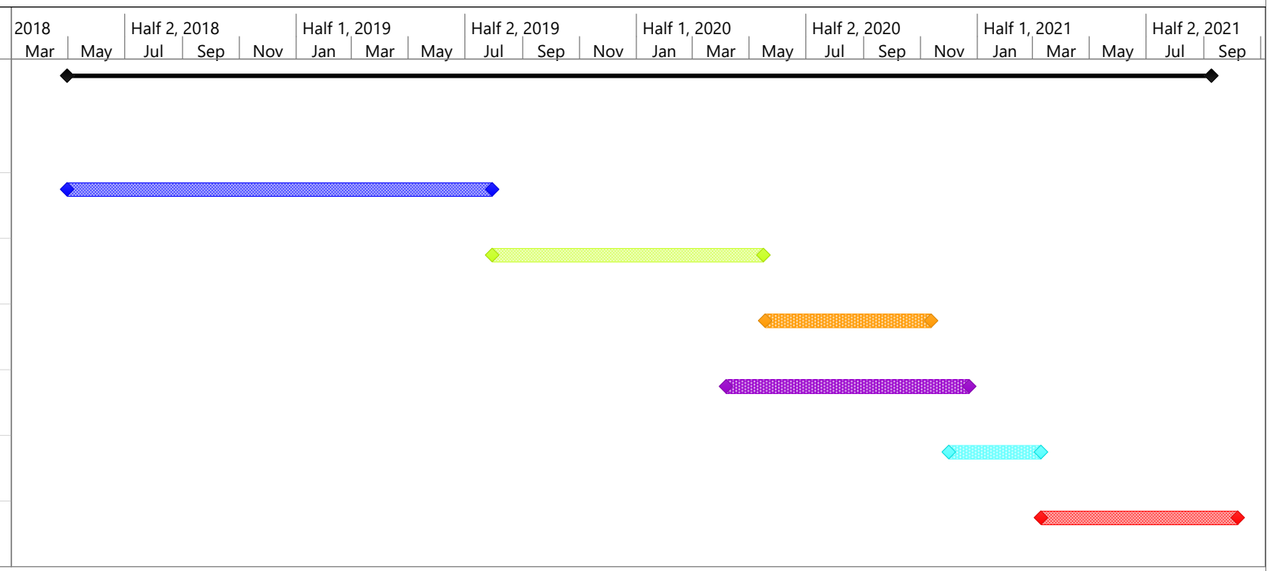


Project: 00054
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction

GOETHE-SHULTS NEIGHBORHOOD IMPROVEMENTS PHASE 2
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**GOETHE/SHULTS NEIGHBORHOOD IMPROVEMENTS PHASE 2**	**878 days**	**Mon 4/30/18**	**Wed 9/8/21**
2	**PLANNING AND CONCEPTUAL DESIGN**	**326 days**	**Mon 4/30/18**	**Mon 7/29/19**
12	**FINAL DESIGN AND CONSTRUCTION DOCUMENTS**	**209 days**	**Tue 7/30/19**	**Fri 5/15/20**
21	**PERMITTING**	**128 days**	**Mon 5/18/20**	**Wed 11/11/20**
25	**EASEMENTS AND LAND ACQUISITION**	**187 days**	**Mon 4/6/20**	**Tue 12/22/20**
32	**BIDDING AND CONTRACTS**	**71 days**	**Tue 12/1/20**	**Tue 3/9/21**
37	**CONSTRUCTION**	**151 days**	**Wed 3/10/21**	**Wed 10/6/21**

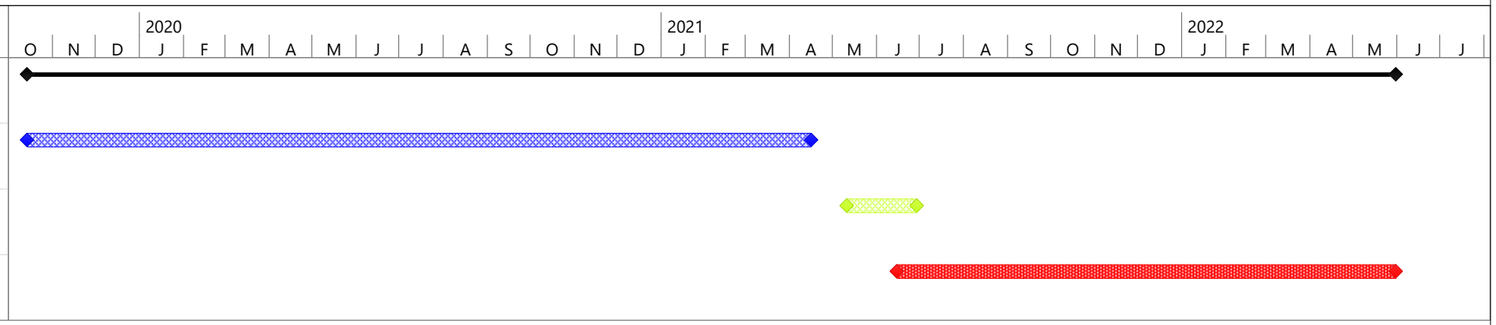


Project: 00055
Date: Tue 1/5/21

Miletstone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

OYSTER FACTORY PARK
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Oyster Factory Park**	**686 days**	**Mon 10/14/19**	**Mon 5/30/22**
2	**Planning and Conceptual Design**	**394 days**	**Mon 10/14/19**	**Thu 4/15/21**
11	**Easement and Land Acquisition**	**35 days**	**Tue 5/11/21**	**Mon 6/28/21**
13	**Construction**	**250 days**	**Tue 6/15/21**	**Mon 5/30/22**

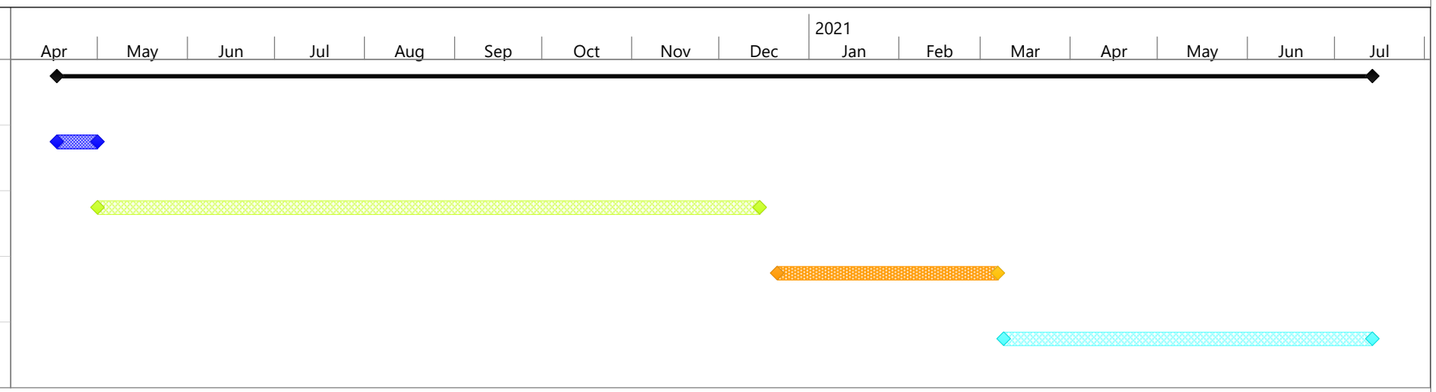


Project: 00059
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

SQUIRE POPE CARRIAGE HOSUE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**Squire Pope Carriage House**	**323 days**	**Fri 4/17/20**	**Tue 7/13/21**
2	**Planning and Conceptual Design**	**10 days**	**Fri 4/17/20**	**Thu 4/30/20**
5	**Final Design and Construction Documents**	**162 days**	**Fri 5/1/20**	**Mon 12/14/20**
10	**Permitting**	**55 days**	**Mon 12/21/20**	**Sun 3/7/21**
13	**Bidding and Contracts**	**91 days**	**Tue 3/9/21**	**Tue 7/13/21**

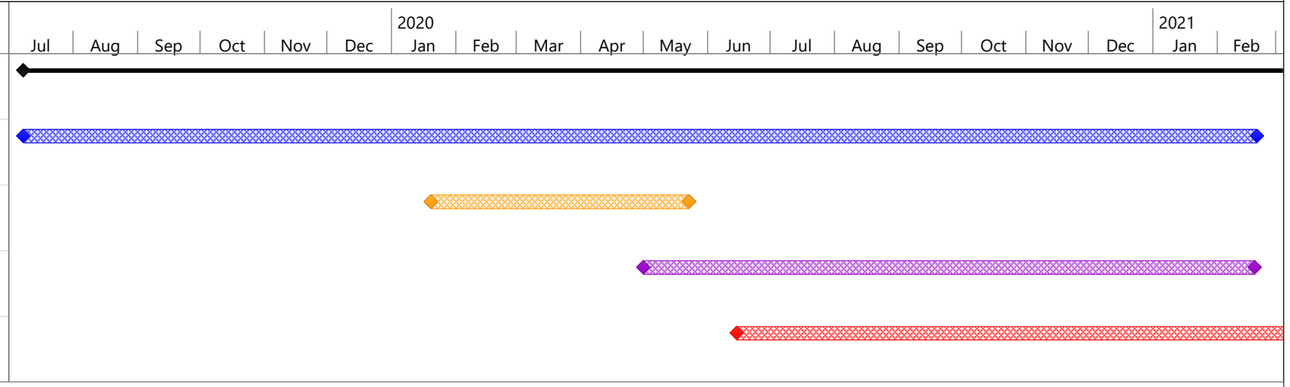


Project: 00067
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BOUNDARY STREET LIGHTING
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**BOUNDARY STREET LIGHTING PHASE 2**	**451 days**	**Mon 7/8/19**	**Mon 3/29/21**
2	**Planning and Conceptual Design**	**425 days**	**Mon 7/8/19**	**Fri 2/19/21**
13	**Permitting**	**90 days**	**Mon 1/20/20**	**Fri 5/22/20**
15	**Easements and Land Acquisition**	**210 days**	**Fri 5/1/20**	**Thu 2/18/21**
18	**Construction**	**206 days**	**Mon 6/15/20**	**Mon 3/29/21**

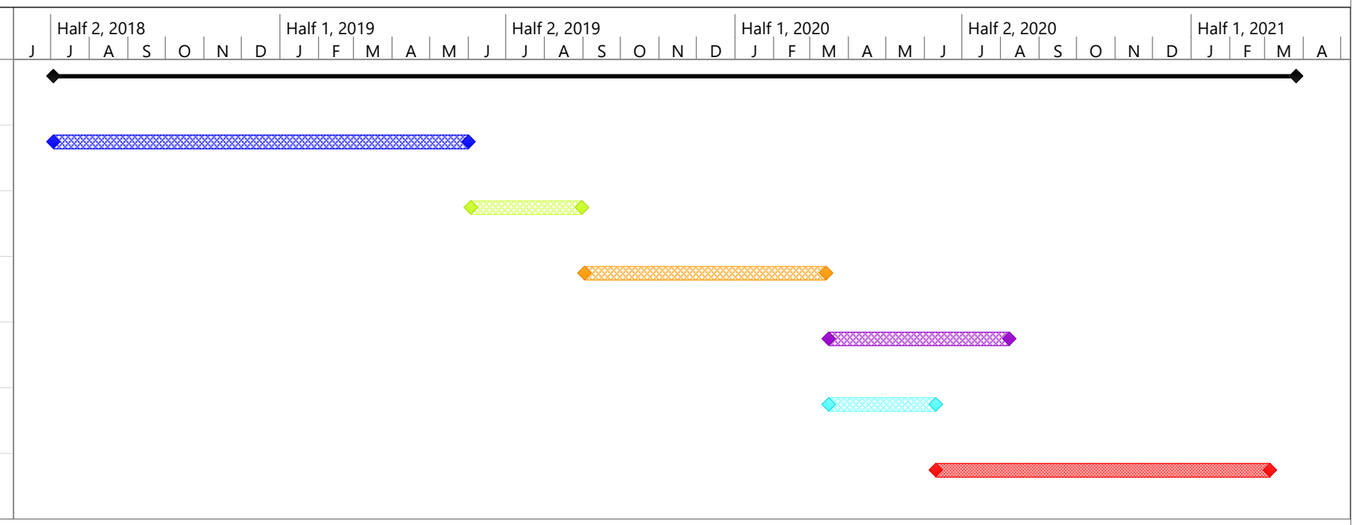


Project: 00069
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contract
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 1
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 1**	**713 days**	**Tue 7/3/18**	**Thu 3/25/21**
2	**Planning and Conceptual Design**	**239 days**	**Tue 7/3/18**	**Fri 5/31/19**
9	**Final Design and Construction Documents**	**65 days**	**Mon 6/3/19**	**Fri 8/30/19**
11	**Permitting**	**140 days**	**Mon 9/2/19**	**Fri 3/13/20**
14	**Easements and Land Acquisition**	**105 days**	**Mon 3/16/20**	**Fri 8/7/20**
17	**Bidding and Contracts**	**62 days**	**Mon 3/16/20**	**Tue 6/9/20**
22	**Construction**	**192 days**	**Wed 6/10/20**	**Thu 3/4/21**

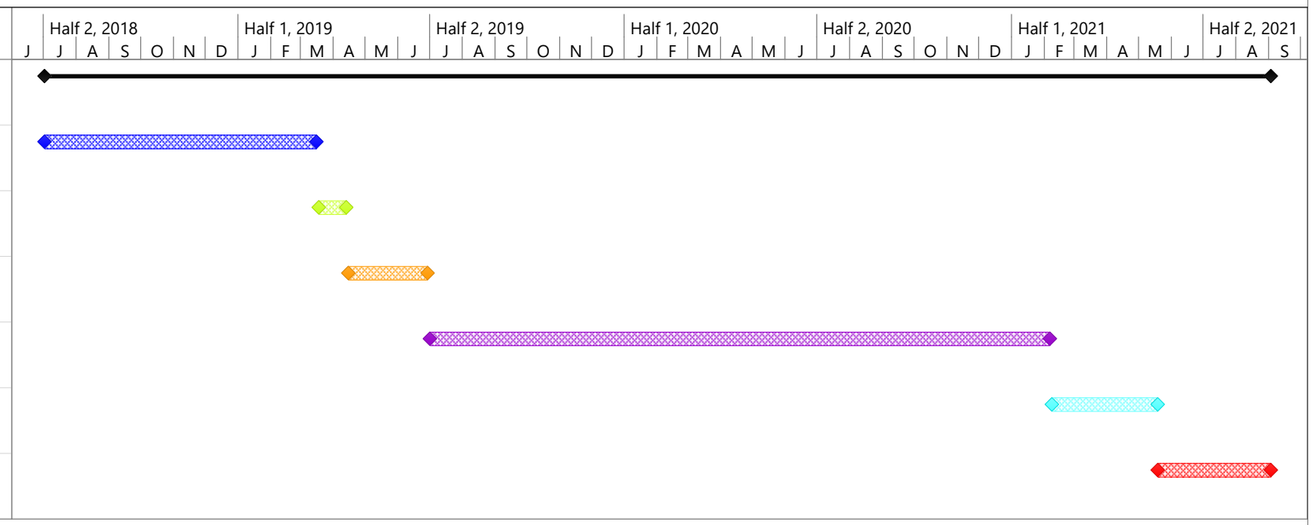


Project: 00070
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 2
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 2**	**829 days**	**Mon 7/2/18**	**Thu 9/2/21**
2	**Planning and Conceptual Design**	**185 days**	**Mon 7/2/18**	**Fri 3/15/19**
10	**Final Design and Construction Documents**	**20 days**	**Mon 3/18/19**	**Fri 4/12/19**
12	**Permitting**	**55 days**	**Mon 4/15/19**	**Fri 6/28/19**
15	**Easements and Land Acquisition**	**420 days**	**Mon 7/1/19**	**Fri 2/5/21**
17	**Bidding and Contracts**	**72 days**	**Mon 2/8/21**	**Tue 5/18/21**
22	**Construction**	**77 days**	**Wed 5/19/21**	**Thu 9/2/21**

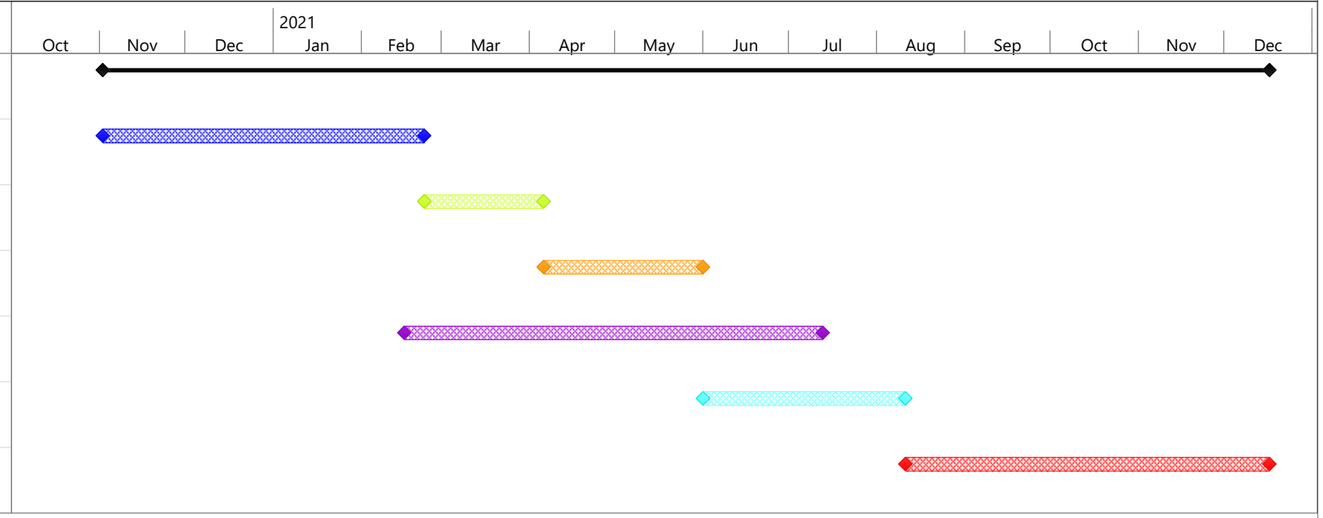


Project: 00071
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 3
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 3**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

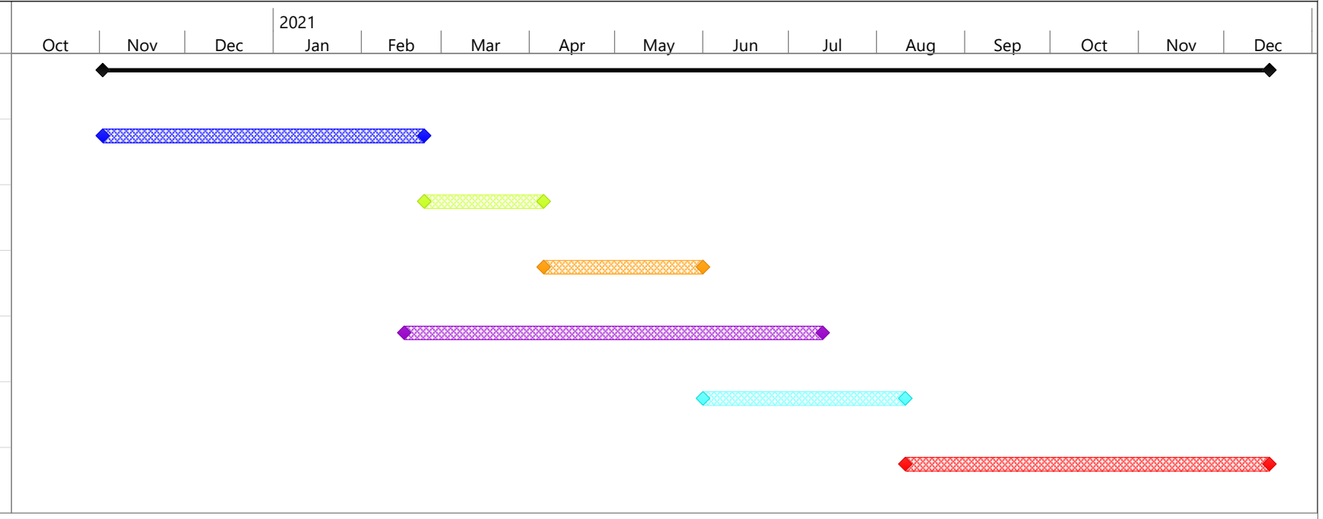


Project: 00072
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 4
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 4**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

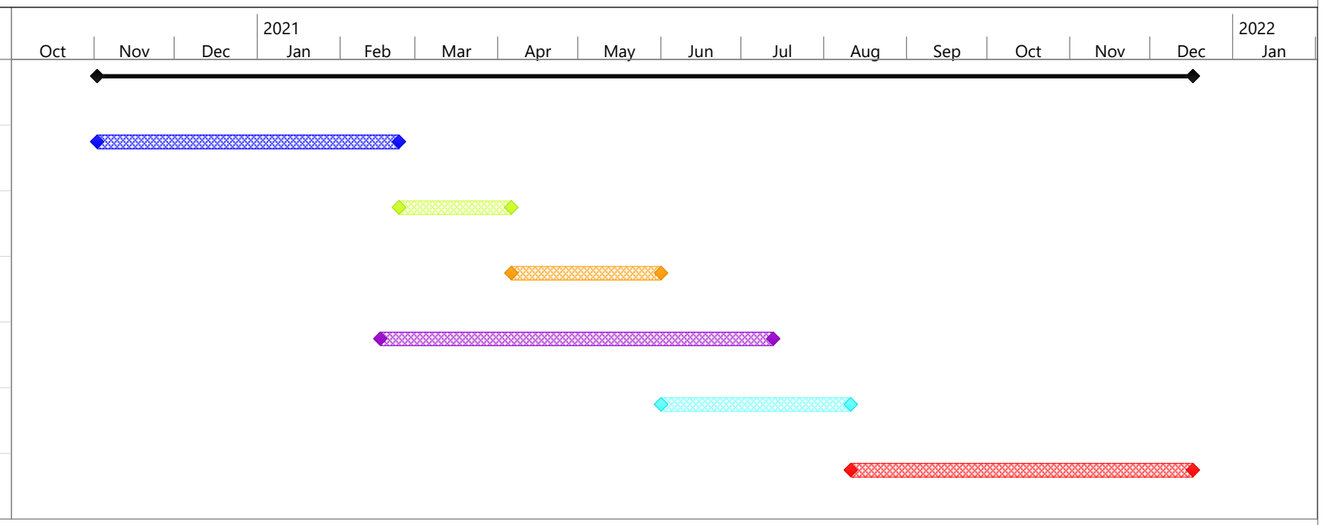


Project: 00073
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 5
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 5**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

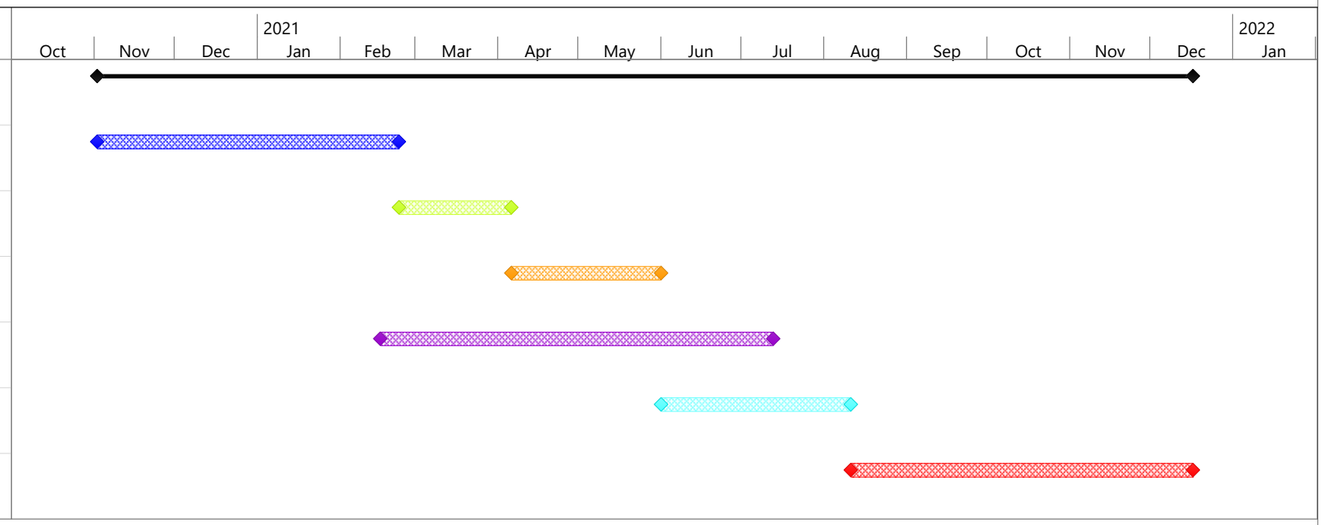


Project: 00074
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

HISTORIC DISTRICT SANITARY SEWER EXTENSION PHASE 6
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**PHASE 6**	**294 days**	**Mon 11/2/20**	**Thu 12/16/21**
2	**Planning and Conceptual Design**	**81 days**	**Mon 11/2/20**	**Mon 2/22/21**
9	**Final Design and Construction Documents**	**30 days**	**Tue 2/23/21**	**Mon 4/5/21**
11	**Permitting**	**40 days**	**Tue 4/6/21**	**Mon 5/31/21**
14	**Easements and Land Acquisition**	**105 days**	**Tue 2/16/21**	**Mon 7/12/21**
17	**Bidding and Contracts**	**51 days**	**Tue 6/1/21**	**Tue 8/10/21**
22	**Construction**	**92 days**	**Wed 8/11/21**	**Thu 12/16/21**

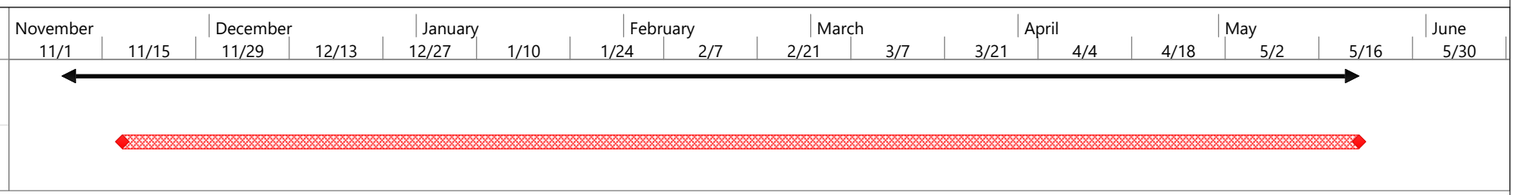


Project: 00075
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planing and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisitions
Bidding and Contracts
Construction

BUCKWALTER MULTI-COUNTY COMMERCE PARK
LEC EXPANSION - PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**LEC Expansion**	**140 days**	**Mon 11/9/20**	**Fri 5/21/21**
2	**Construction**	**133 days**	**Wed 11/18/20**	**Fri 5/21/21**

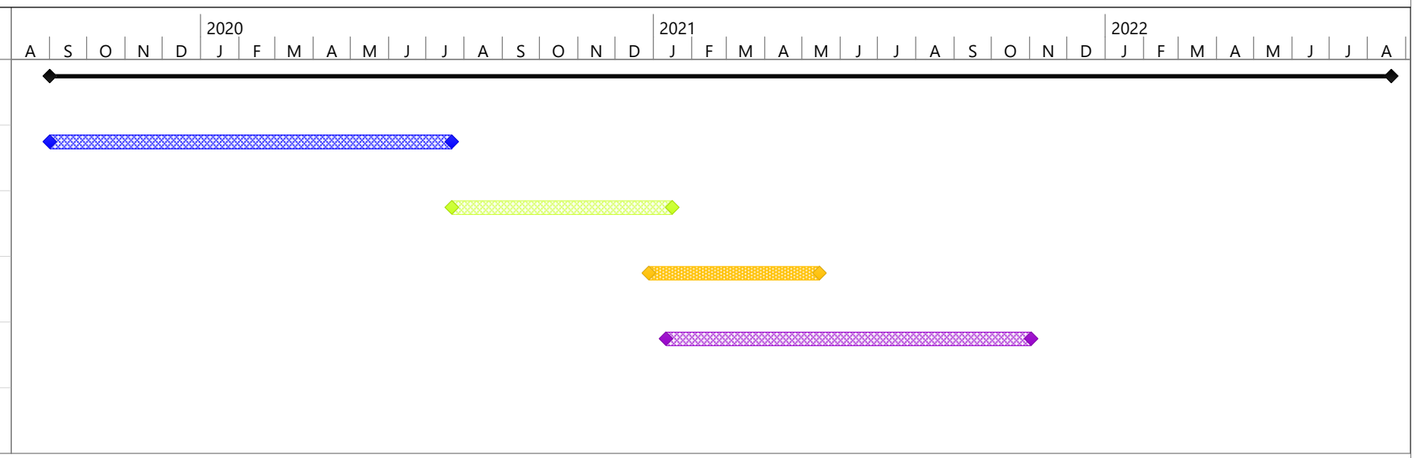


Project: 00077
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

BRIDGE STREET STREETSCAPE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**BRIDGE STREET STREETSCAPE**	**776 days**	**Sun 9/1/19**	**Fri 8/19/22**
2	**Planning and Conceptual Design**	**232 days**	**Sun 9/1/19**	**Tue 7/21/20**
17	**Final Design and Construction Documents**	**128 days**	**Wed 7/22/20**	**Fri 1/15/21**
22	**Permitting**	**100 days**	**Mon 12/28/20**	**Fri 5/14/21**
27	**Easements and Land Acquisition**	**211 days?**	**Mon 1/11/21**	**Mon 11/1/21**
37	**Construction**			

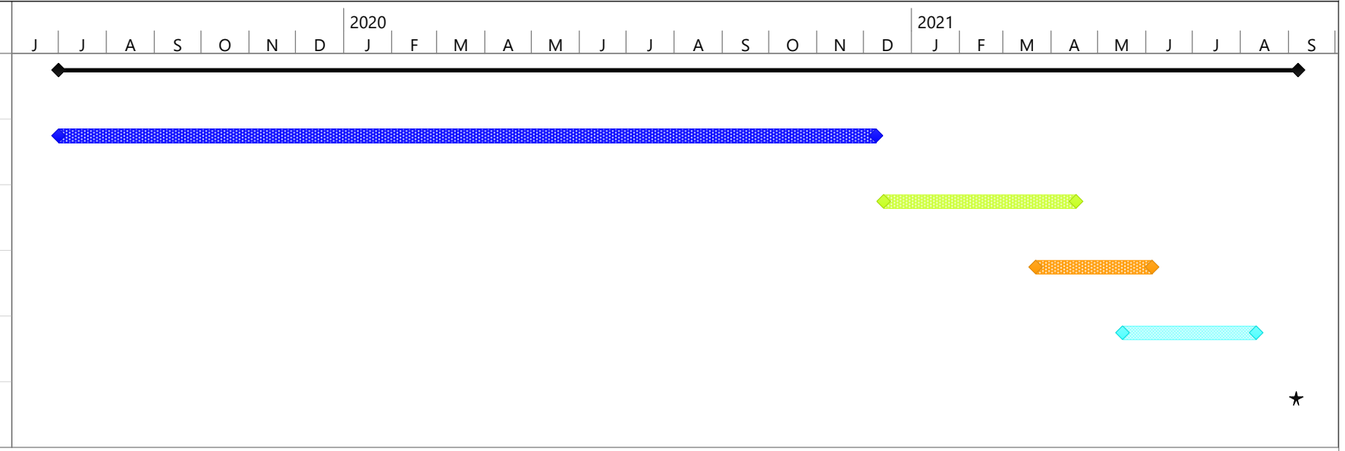


Project: 00082
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

NEW RIVERSIDE PARK/BARN SITE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**NEW RIVERSIDE PARK/BARN SITE**	**571 days**	**Mon 7/1/19**	**Mon 9/6/21**
2	**Planning and Conceptual Master Plan**	**377 days**	**Mon 7/1/19**	**Tue 12/8/20**
27	**Final Design (Phase 1)**	**90 days**	**Mon 12/14/20**	**Fri 4/16/21**
36	**Permitting (Phase 1)**	**55 days**	**Mon 3/22/21**	**Fri 6/4/21**
40	**Bidding (Phase 1)**	**62 days**	**Mon 5/17/21**	**Tue 8/10/21**
46	**Construction Start**	**1 day**	**Mon 9/6/21**	**Mon 9/6/21**

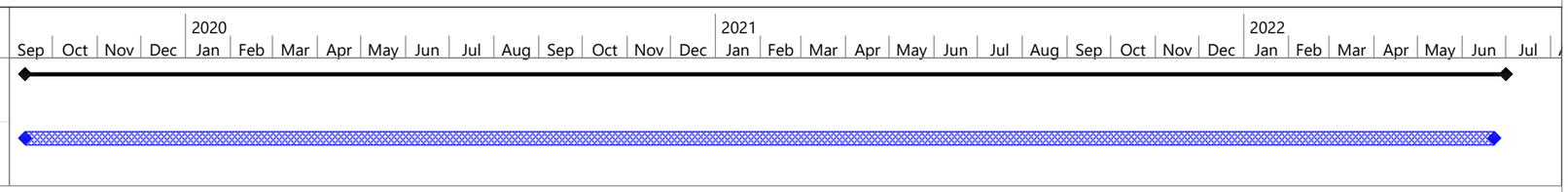


Project: 00085
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

GHOST ROADS
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**GHOST ROADS**	**731 days**	**Thu 9/12/19**	**Thu 6/30/22**
2	**Planning and Conceptual Design**	**731 days**	**Thu 9/12/19**	**Thu 6/30/22**

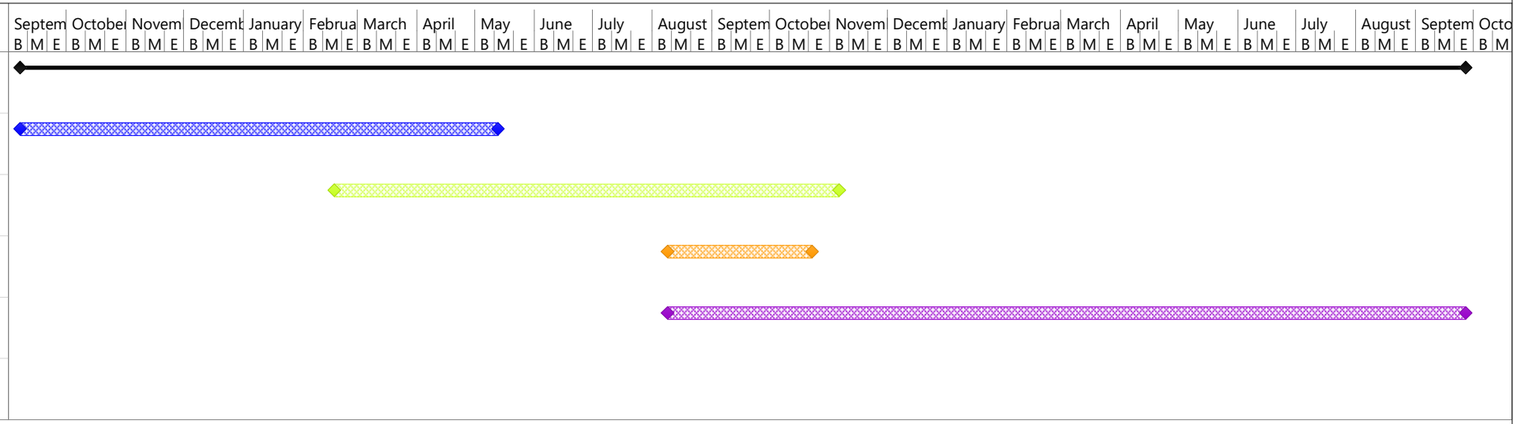


Project: 00093
Date: Tue 1/5/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Easements and Land Acquisition
Bidding and Contracts
Construction

BOUNDARY STREET STREETSCAPE
PROPOSED SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**BOUNDARY STREET STREETSCAPE**	**536 days**	**Mon 9/7/20**	**Mon 9/26/22**
2	**Planning and Conceptual Design**	**178 days**	**Mon 9/7/20**	**Wed 5/12/21**
13	**Final Planning and Construction Documents**	**188 days**	**Wed 2/17/21**	**Fri 11/5/21**
27	**Permitting Phase**	**55 days**	**Mon 8/9/21**	**Fri 10/22/21**
32	**Easements and Land Acquisition**	**296 days**	**Mon 8/9/21**	**Mon 9/26/22**
41	**Construction**			



Project: 00094
Date: Wed 1/27/21

Milestone
Critical Task
Task
Project Duration
Planning and Conceptual Design
Final Design and Construction Documents
Permitting
Bidding and Contract
Easements and Land Acquisitions
Construction

BEAUFORT COUNTY
STORMWATER MANAGEMENT UTILITY BOARD AGENDA
Wednesday, June 9th, 2021
2:00 p.m.
County Council Chambers, Administration Building
Beaufort County Government Robert Smalls Complex
100 Ribaut Road, Beaufort, South Carolina
843.255.2805

In accordance with South Carolina Code of Laws, 1976, as amended, Section 30-4-80(d), all local media was duly notified of the time, date, place and agenda of this meeting.

1. CALL TO ORDER – 2:00 p.m.
   A. Approval of Agenda
   B. Approval of Minutes – March 10th, 2021 (backup)

2. INTRODUCTIONS

3. PUBLIC COMMENT

4. REPORTS
   A. Utility Update – Katie Herrera (backup)
   B. Monitoring Update – Katie Herrera (backup)
   C. Stormwater Implementation Committee Report – Katie Herrera (backup)
   D. Stormwater Related Projects – Katie Herrera (backup)
   E. Upcoming Professional Contracts Report – Katie Herrera (backup)
   F. Regional Coordination – Katie Herrera (backup)
   G. Municipal Reports – Katie Herrera (backup)
   H. MS4 Update – Katie Herrera (backup)
   I. Maintenance Projects Report – Matthew Rausch (backup)

5. UNFINISHED BUSINESS
   A. 2021 SWUB Schedule

6. NEW BUSINESS
   A. Delinquent Accounts - Brittany Ward
   B. Shell Point Drainage Study - Cranston Engineering
   C. Cypress Wetlands Restoration - Town Of Port Royal

7. PUBLIC COMMENT

8. NEXT MEETING AGENDA

   A. Wednesday, September 8th, 2021 (backup)

9. ADJOURNMENT