

Beaufort County Comprehensive Water Quality Monitoring Plan



November 2018

**Beaufort County
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1 Introduction

In 2016, Beaufort County developed a “Monitoring and Assessment Plan for TMDL and Impaired Waters” document and began implementation of monitoring. Much data has been collected in various locations throughout the County in an effort to determine baseline water quality at outfalls. During a program assessment in 2018, the County determined that a refined focus was needed on TMDL waters, as well as on impaired streams. This document outlines that focus and replaces the previous monitoring plan dated December 1, 2016. Additional categories of monitoring have been included in this document as well.

2 Monitoring Point Summary

Monitoring locations were chosen to meet the Countywide monitoring goals, found in section 3. The locations are summarized in Table 1 below, along with the monitoring category. Explanations of the monitoring categories can also be found in Section 3.

Table 1. Monitoring point summary

Point Name	Monitoring Category	Point Name	Monitoring Category	Point Name	Monitoring Category
BCCC1	1, 4	SHPOX1	5	CS-03A	4,5
BCCC2	1, 4	SHPOX2	5	OKWP1	5
BCOK1	1, 4	SHPIN	5	OKWPBG	5
BCOK2	1, 4	SHPOUT	5	OKWPBOX	5
BCOK3	1, 4	SMPIN	5	OKWPOUT	5
OKW3A	1, 4	SMPOUT	5	OKWP2	5
New1	3, 4	BMPRGIN	5	OKWP3	5
BCD-PR	3	BMPRGOUT	5	SCPIN	5
BCD-HC	3	WMP-IN	5	SCPOUT	5
BCD-CR	3	WMP-OUT	5	BMPIDIN	5
BCD-LM	3	WMP-WET	5	BMPIDOUT	5
BCD-RS	3, 5	WMP-278	5	BMPPCIN	5
BCD-YM	3	BL#4IN	5	BMPPCOUT	5
BCBR1	3, 4	BL#4OUT	5	BMPTBIN	5
BCBR2	3, 4	BL#3IN	5	BMPTBOUT	5
BCBR3	3, 4	BL#3OUT	5	BMPHSIN	5
BCBR4	3, 4	CW-01	4,5	BMPHSOUT	5
BCBR5	3, 4	CW-01A	4,5	DUP	3, 4, 5
BCBR6	3, 4	CW-02	4,5	DDown	3, 4, 5
BCBR7	3	CW-03	4,5	Warehouse	3, 4, 5
				Sands	3, 4, 5
				MRR02	1, 4

3 Monitoring Strategy

3.1 Monitoring goals and categories

The County’s monitoring goals are as follows:

- Develop an understanding of baseline water quality in the County's streams.
- Identify and remove non-stormwater (or illicit) discharges from the stormwater system to protect better the health of streams and rivers within the County.
- Determine if discharges from the County's SMS4 are or may be contributing to an impairment or TMDL in streams and rivers within the County. As of the date of this revised monitoring plan, there are three TMDLs impacting the County: Beaufort River Dissolved Oxygen TMDL and Okatie and Chechessee Fecal Coliform TMDLs. There are numerous impaired stream segments within the County as well.
- Comply with the County's SMS4 permit requirements.
- On a project by project basis, develop an understanding of the effectiveness of best management practices installed in the County as they relate to water quality.

The County's comprehensive monitoring program is divided into 5 categories as follows:

- **Category 1. TMDL monitoring.** The County's SMS4 permit requires that the County monitor TMDL watersheds to determine the SMS4's contribution. This category of points has been established based upon the Beaufort River, Okatie River and Chechessee River TMDL documents.
- **Category 2. IDDE screening and monitoring.** The County's SMS4 permit also requires that the County identify priority areas to screen outfalls for illicit discharges. The County's illicit discharge detection and elimination program includes multiple screening priorities, one of which is focused on known impaired streams. This category includes those impaired streams and places a priority on a desktop analysis and outfall screening in those watersheds to search for potential contributors to those impairments.
- **Category 3. Water quality monitoring.** The County also monitors water quality in streams that are impaired in an effort to determine causes and begin moving towards improvements. This category of monitoring includes monitoring stations based upon the 303(d) list.
- **Category 4. MOA points.** The County has entered into Memorandums of Agreement (MOAs) with several other agencies within Beaufort County. These points are monitoring points that fall under these agreements.
- **Category 5. Special Project monitoring.** Often, the County installs water quality BMPs and monitors those BMPs to show effectiveness. This category of points includes those special projects.

4 Partnerships

The County has developed several critical partnerships to help meet the objectives of this monitoring plan.

Town of Bluffton. Based upon the Memorandum of Agreement between the County and the Town, the County is performing baseline stormwater quality monitoring in the Colleton and the New Rivers and the Town of Bluffton is performing monitoring in the May River. The County's monitoring stations in the Colleton and the New River watersheds are identified below:

BCCC1
 BCCC2
 BCOK1
 BCOK2
 BCOK3

OKW3A
NEW1 (formerly NRW01)

Town of Port Royal. Based upon the Memorandum of Agreement between the County and Town, the County is performing outfall monitoring to determine baseline stormwater quality for the Town of Port Royal. The following stations are being monitored for baseline stormwater quality and/or special project monitoring:

BCBR2
BCBR3

In addition, Port Royal is also monitoring the following stations:

DUP
Ddown
Warehouse
Sands
CW-01
CW-01A
CW-02
CW-03
CW-03A

City of Beaufort. Based upon the Memorandum of Agreement between the County and City, the County is performing monitoring to determine baseline stormwater quality monitoring for the City of Beaufort. The following stations are being monitored for baseline stormwater quality:

BCBR5
BCBR6
BCBR4

University of South Carolina Beaufort. Based upon the Memorandum of Understanding between the County and USCB, the University is performing field work and data analysis for the County's comprehensive monitoring program as follows:

- The University is performing field grab sampling consistent with the protocols contained in their SOP.
- The University is completing at least 1 wet weather grab sample per location per quarter consistent with the protocols in their SOP.
- The University is analyzing the samples for the parameters identified in the contract with the County.
- The University will provide a data summary for each point quarterly.
- The County must complete an analytical water quality service request form for each point and constituents to be monitored.

5 TMDL Monitoring (Category 1)

5.1 Background on SMS4 permit requirements for TMDL monitoring

The County's SMS4 permit requires the development of a TMDL monitoring plan to determine pollutant levels discharged from the SMS4. The SMS4 permit, effective January 1, 2014, includes the following requirements for TMDL monitoring (Section 3.2.1.2.1 in the permit):

- *TMDL monitoring must be conducted for not less than two years.*
- *Samples and measurements taken for the purpose of the TMDL Monitoring Plan shall:*
 - (1) *Be representative of the SMS4 discharges,*
 - (2) *Be reasonably distributed in time, while maintaining representative sampling,*
 - (3) *Not be terminated for the purpose of preventing the analysis results from a permit or water quality violation,*
 - (4) *Describe and consider frequency, mass and/or rate of discharge, as appropriate, and,*
 - (5) *Be expressed in terms of units or measurements consistent with the requirements contained in the WLA.*
- *Monitoring must focus on the pollutant of concern or its surrogate.*
- *In-stream or outfall monitoring can be conducted.*
- *Stations to monitor must be considered representative of the MS4, be in an area that at least 25% of the area draining to the station must be MS4 or can include the entire TMDL watershed with the MS4.*
- *Sampling and lab analysis protocols must be developed*
- *Monitoring data must be provided with each annual report.*

Beaufort County has the following TMDLs:

- **Beaufort River, dissolved oxygen, approved April 2006**
- **Okatie River for shellfish fecal coliform, shellfish management area 18, approved September 2010**
- **Chechessee Creek for shellfish fecal coliform, shellfish management area 18, approved March 2013**

Sixty months after SMS4 permit issuance, the County is to develop and submit a TMDL implementation plan to DHEC. It should be noted that a new SMS4 general permit is expected to be issued at the beginning of 2019, so this criterion may be revised.

To determine monitoring points that are representative of the SMS4 area for each TMDL, an in-depth data analysis of each of the TMDL watersheds was performed. The following existing data sets were part of that analysis:

- Beaufort County's sub-watersheds, derived from LiDAR data from 2013 and aerials from 2018
- DHEC monitoring station locations

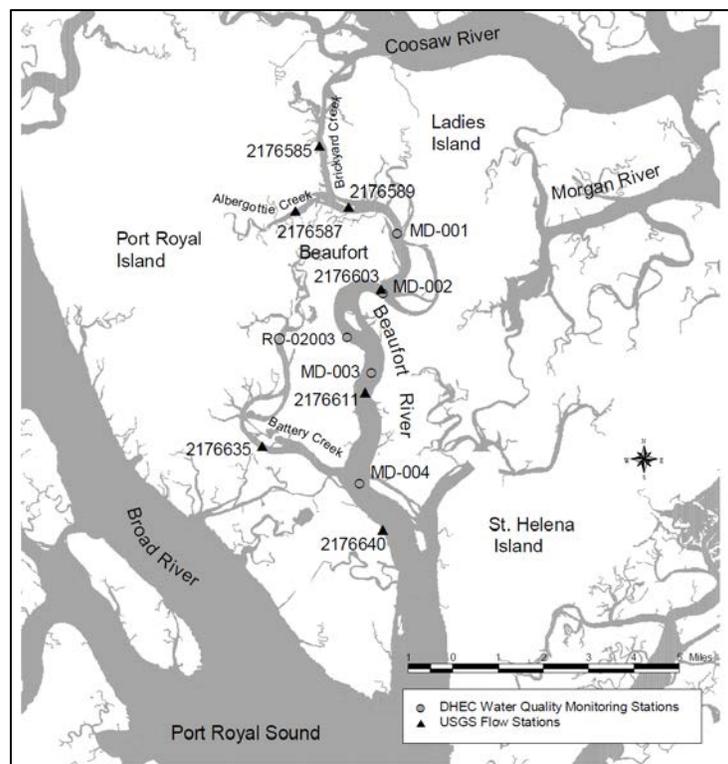
- County-owned or maintained drainage system and easements
- County and Town/City owned parcels
- Municipal boundaries
- Parcel development date and type

Most of the TMDL monitoring points are outfalls, though one is an instream point. For all TMDL monitoring points, wet weather samples will be collected quarterly, as the analysis relates to stormwater flows and not base flow. BCOK1 will also have once quarterly dry event monitoring, per the MOA with Bluffton.

5.2 Beaufort River TMDL for Dissolved Oxygen

Based upon the TMDL, the pollutants of concern are oxygen demanding substances, carbonaceous and nitrogenous biochemical oxygen demand. The numeric dissolved oxygen criteria is a daily average of 5.0 mg/l with a low of 4.0 mg/l for class SA and SFH waters. DHEC monitoring stations that are impaired are MD-001 located at the confluence of Albergotti Creek and Beaufort River, MD-002, MD-003, and MD-004 located at the confluence of Battery Creek and Beaufort River (see Figure 1). In addition, Albergotti and Battery Creeks are also considered impaired.

Figure 1. Impaired monitoring stations (from the DHEC Beaufort River TMDL)



The 2006 DO TMDL appears to point to the waste water dischargers along the Beaufort River as the primary source of DO issues. Modeling for the TMDL indicated that low dissolved oxygen is naturally occurring, and that the point dischargers (WWTFs) were exacerbating the low DO levels (see section 2 of the TMDL). Two scenarios were modeled to show compliance with water quality standards. Since the development of the TMDL, 2 of the 3 WWTFs have been closed down, so only one remains which is consistent with the 2nd scenario in the TMDL.

To understand the TMDL better, County staff reached out to DHEC’s TMDL office staff, Matt Carswell and Wade Cantrell, who indicated that stormwater wasn’t considered an issue when developing the Beaufort River TMDL. In addition, DHEC’s current water quality monitoring data were obtained that show all previously impaired stations on the Beaufort River are currently “fully supporting their designated use” which means that the River is no longer impaired. **It does not appear that stormwater was assigned a waste load allocation, and the TMDL does not apply to the MS4. Therefore, Beaufort County believes that MS4 TMDL monitoring is not required for the Beaufort River.**

5.3 Okatie and Chechessee Rivers’ TMDLs for Shellfish Fecal Coliform

Both the Okatie and Chechessee Rivers have separate TMDLs for fecal coliform and are shellfish areas. Land use and development are similar in both watersheds. Therefore, their monitoring plan has been developed together. Table 2 contains a breakdown of developed, undeveloped and water acreage in each watershed, by County subwatershed. These watersheds are primarily undeveloped land and marsh/open water. The County MS4 is very similar in both watersheds: low density residential development, roads and passive parks. The monitoring strategy in these watersheds is similar since the land use is similar. In the Okatie, residential development with County maintained drainage systems will be monitored. In the Chechessee, low density development and undeveloped properties will be monitored. The findings in each of these watersheds will apply to both TMDL watershed areas.

Table 2. Acreage Breakdown for Okatie and Chechessee Rivers TMDL Watersheds

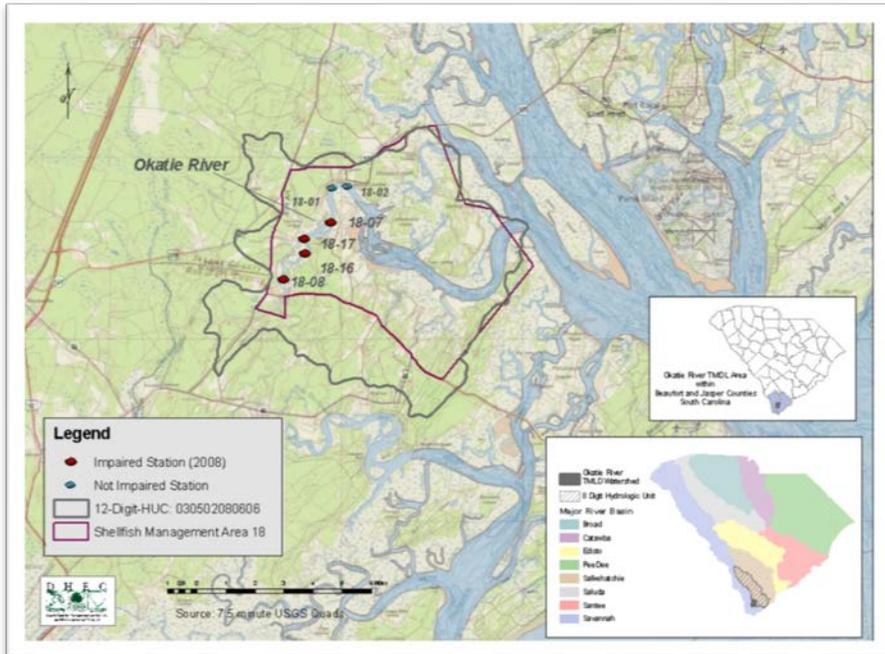
Subwatershed	Total watershed (ac)	Marsh and open water (ac)	% Watershed	Impervious surfaces (ac)	% Watershed	Undeveloped land (ac)	% Watershed
Okatie TMDL Watershed	8730	1616	19	715	8	6399	73
Okatie River 1	4348	1208	28	226	5	2914	67
Okatie River 2	930	361	39	59	6	510	55
Okatie River 3	3452	47	1	430	12	2975	86
Chechessee TMDL Watershed	9981	4600	46	348	3	5033	50
Colleton River 3	6291	3261	52	274	4	2756	44
Colleton River tidal flats	656	332	51	18	3	306	47
Chechessee Creek 1	1452	529	36	18	1	905	62

Chechessee Creek 2	1582	478	30	38	2	1066	67
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5.3.1 Okatie River TMDL Watershed.

Based upon the TMDL, the pollutant of concern is fecal coliform. The numeric criteria target is 40.9 cfu/100ml for shellfish areas (43 cfu/100ml less a 5% margin of safety). DHEC monitoring stations that are impaired are 18-07, 18-08, 18-16, and 18-17 as shown in Figure 2.

Figure 2. Okatie River TMDL area



The County subwatersheds that drain to these stations are depicted in Figure 3, as are County owned/maintained stormwater systems and easements. The majority of land ownership in this watershed is private, consisting of private, gated residential neighborhoods. Beaufort County assumes responsibility for some stormwater components (as indicated in Figure 3) but not all. The County owns several large parcels of land in this watershed and operates them as passive parks or as conservation areas. The representative monitoring points chosen can be found in Figures 3 and 4. All three monitoring points in this watershed are located at outfalls and will be monitored quarterly during wet weather events.

BCOK3 is located in the upper watershed below a low density residential subdivision built in the 1980's, where the County maintains the drainage system. Based upon information from BJWSA (see Appendix A), this subdivision appears to be on sewer. See Figure 4.

BCOK2 is located below a newer residential subdivision, built in the 2000's, where the County also maintains the stormwater system. Based upon information from BJWSA (see Appendix A), this subdivision appears to be on sewer. See Figure 5.

BCOK1 is located near the more densely-developed area near Bluffton. The drainage to this point contains both Town of Bluffton and County development, as well as private development. Based upon information from BJWSA (see Appendix A), this area appears to also be on sewer.

OKW3A is located below a large residential subdivision, build in the 2000's, where the community manages the Stormwater system. The subdivision includes 3 golf courses, and is on sewer. See Figure 3.

Figure 3 Okatie TMDL Watershed Area

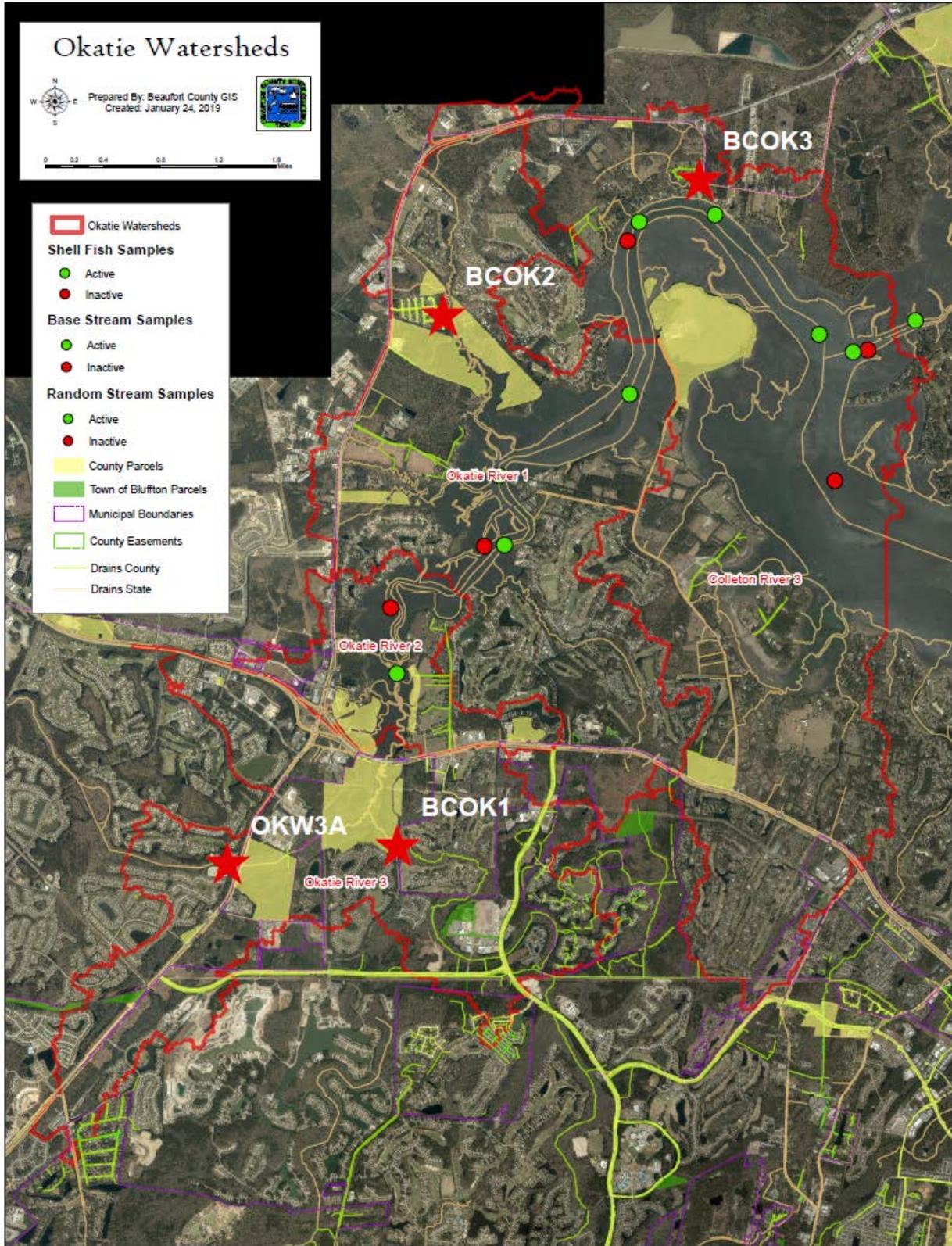


Figure 4 BCOK3 Monitoring Point Location (1980's residential development)



Figure 5 BCOK2 Monitoring Point Location (2000's residential development)



The table below contains the point locations, sampling type and a brief description for each point.

Table 3. Okatie TMDL Monitoring Points Summary

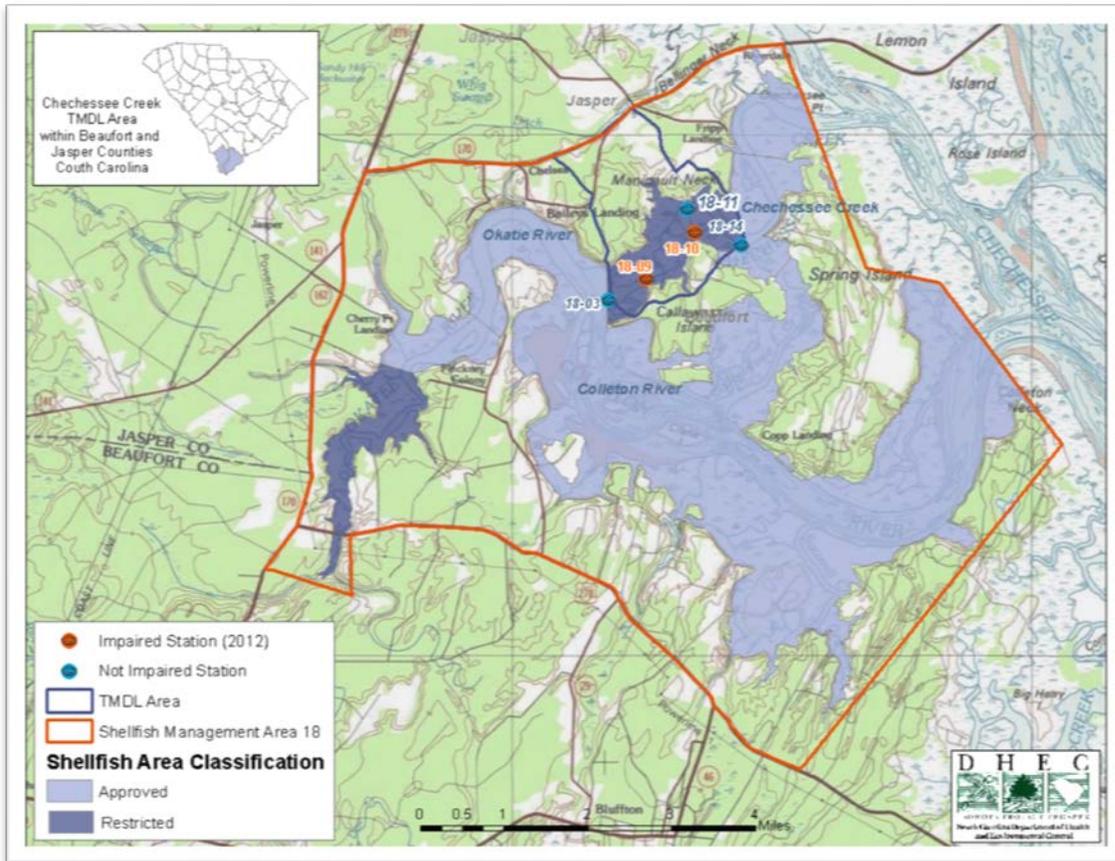
Point name	Latitude	Longitude	Sample type¹	Description of monitoring location
<i>BCOK1</i>	32.28091	-80.927427	IS	Okatie East retrofit project. Captures drainage from Town of Bluffton prior to going into Okatie River
<i>BCOK2</i>	32.334256	-80.922064	OF	Newer subdivision
<i>BCOK3</i>	32.347956	-80.891652	OF	Small development with County maintained roads, ditches, and pipes.
<i>OKW3A</i>	32.279024	-80.947612	IS	Captures large subdivision drainage prior to crossing under Highway 170 and entering the Okatie River.

Note: 1 Sample type is outfall (OF).

5.3.2 Chechessee River TMDL Watershed

A section of the Chechessee River is impaired and has a TMDL for fecal coliform. The impaired stations are 18-09 and 18-10 as depicted in Figure 6. The land near these impaired stations is primarily marsh. Upland areas are residential development and undeveloped passive parks and conservation areas.

Figure 6. Chechessee Creek TMDL area



In Figure 7 below, County owned properties and County maintained drainage systems are identified. Several large, undeveloped properties exist in this watershed, owned by either the County or the Town of Port Royal are located in this watershed. Other development includes private residential development. Much of the development in this area has sewer, based upon information from BJWSA (see Appendix A). Two monitoring locations are proposed for this watershed, both representing low density or undeveloped areas of the watershed.

BCCC1 is located below a mostly undeveloped area, where the County maintains the drainage system. This monitoring point will be located at an outfall and will be sampled during wet weather.

BCCC2 is also located at the outfall of a mostly-undeveloped watershed. The County maintains some roads and the drainage system above the monitoring point. This monitoring point will be located at an outfall and will be sampled during wet weather.

Figure 7. Chechessee TMDL Watershed Area

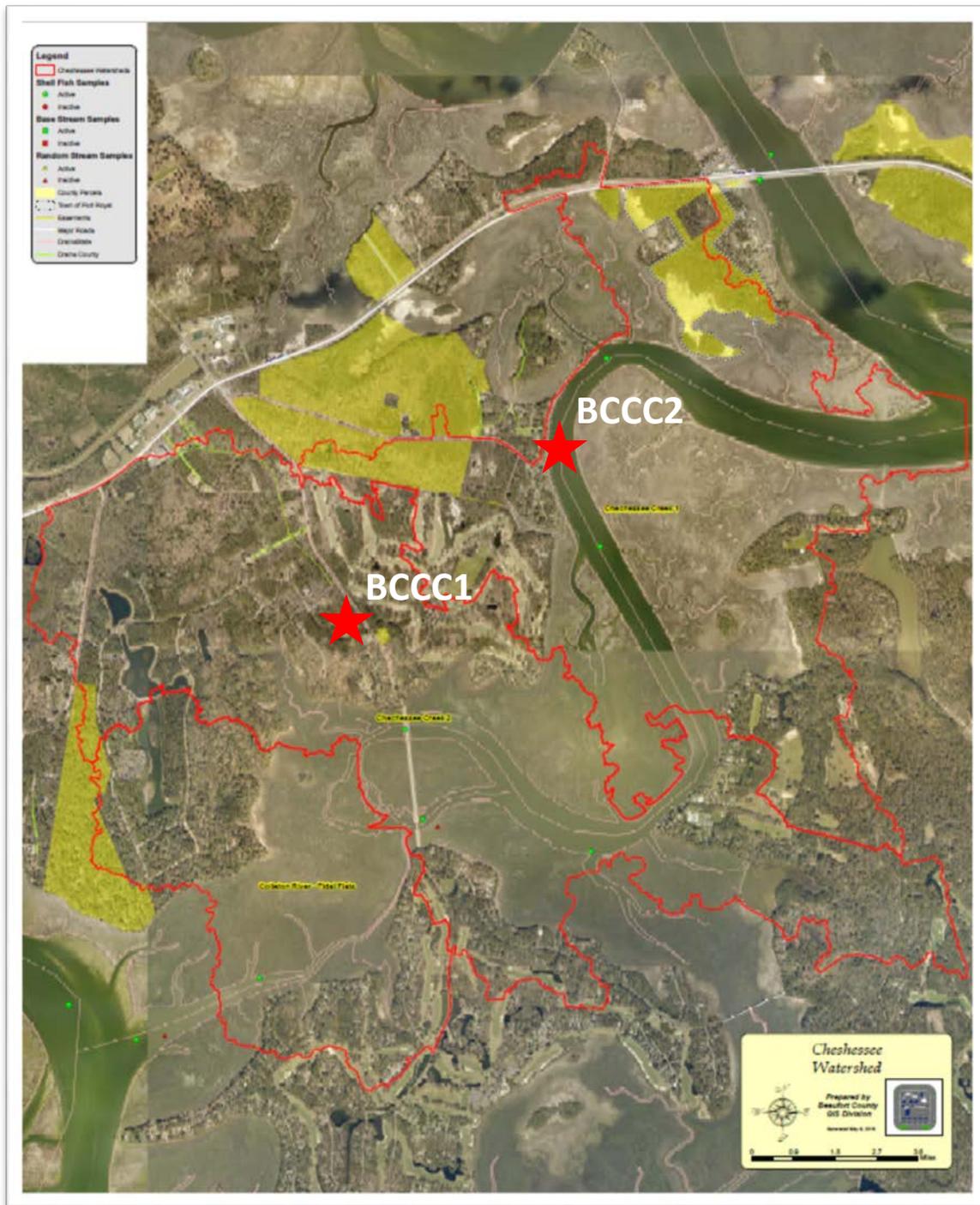


Table below contains a summary of the points, the locations of the points and the monitoring type.

Table 4. Chechessee TMDL Monitoring Points Summary

Point name	Latitude	Longitude	Sample type¹	Description of monitoring location
BCCC1	32.362725	-80.850829	OF	Discharge point for County owned, undeveloped land converges to this pipe. Located at the bottom left of a causeway.
BCCC2	32.355973	-80.864191	OF	Cross pipe from County owned roads. Drainage from County roads passes through pipe.

Note: 1 Sample type is outfall (OF).

5.4 Monitoring Schedule Summary for TMDL points

All monitoring points will be categorized as wet or dry sampling events based upon the criteria set in Section 5.6.

Category 1 TMDL water quality monitoring points will be sampled quarterly during wet weather while the tide is going out (ebb tide) to decrease the potential for a tidal influence in the samples. Samples should be collected during the first 3 hours of the rain event, if feasible. OKW3A will have one dry and one wet sampling event per quarter, as written in the Bluffton MOA.

5.5 Sample Analysis Summary

Field parameters monitored during each sampling event include air temperature, water temperature, dissolved oxygen (DO), conductivity/salinity, pH, turbidity and discharge. In addition, the following parameters will be analyzed for each point:

Table 5. Monitoring points and pollutants to be analyzed

Watershed	Point Number	Sample analyses
<i>Chechessee River</i>	BCCC1	E. Coli, Nitrate, Nitrite, Ammonia, P
	BCCC2	E. Coli
<i>Okatie River</i>	BCOK1	E. Coli
	BCOK2	E. Coli
	BCOK3	E. Coli
	OKW3A	E. Coli

5.6 Protocols

The monitoring goals in this plan are based upon stormwater and water quality criteria. To understand how to apply the criteria, samples must be identified as representative of stormwater (wet) or baseflow (dry) conditions. The following definitions apply to this monitoring plan sampling:

- Wet weather samples are collected during or immediately following a rain event, where the discharge at an outfall is primarily stormwater. To isolate discharges that are primarily stormwater, instream and outfall samples should be taken based upon the following criteria:
 - The depth of the storm must be greater than 0.1 inch accumulation
 - The storm event must be preceded by at least 72 hours of dry weather.
- Dry weather samples are collected when it is NOT raining. Dry weather sampling in a stream is indicative of baseflow conditions. In addition, dry weather flow at an outfall could be an indication of an illicit discharge.

Watershed conditions should be observed, and the rain event amounts that result in discharge at each sampling location should be determined. Additionally, sampling should occur for all locations in an outgoing tide.

All sample collection and analytical monitoring will be done in accordance with USCB SOP's which can be found in Appendix B. All sample analyses will be done by a lab that is certified through the SCDHEC.

Record keeping

All sampling records are provided routinely from the USCB laboratory. USCB also maintains equipment calibration and maintenance records and will provide these records upon request.

6 Impaired Streams

In addition to TMDL watersheds, the County also has streams that are considered impaired and therefore are on the 303(d) list. Table 6 contains the 303(d) listed streams from the final 2016 303(d) list and the draft 2018 303(d) list prepared by DHEC.

Table 6. 2016 and Draft 2018 303(d) list of impaired waterbodies

DHEC Point Name	Waterbody Information	Use	Impairment
<i>CSTL-098</i>	<i>COMBAHEE RVR AT US 17 10 MI ESE YEMASSEE</i>	<i>Aquatic life</i>	<i>DO</i>
	<i>COMBAHEE RVR AT US 17 10 MI ESE YEMASSEE</i>	<i>FISH</i>	<i>HG</i>
<i>RO-09367</i>	<i>bull river where William Creek and Wimbee Creek meet with the Bull River between Chisolm and Buzzard Islands Close to the Chisolm Island side of Bull River</i>	<i>Aquatic life</i>	<i>turbidity</i>
<i>RT-01643</i>	<i>Trib to Bull River, 7.5 M NS of Beaufort</i>	<i>Aquatic life</i>	<i>turbidity</i>
<i>RO-036037</i>	<i>Wimbee Creek 0.7 M SE of Mouth of S Wimbee CK</i>	<i>Aquatic life</i>	<i>turbidity</i>
<i>RO-14351</i>	<i>WIMBEE CREEK APPROX 1 MI NW OF THE MOUTH OF SOUTH WIMBEE CREEK AND SHELLFISH SITE 14-17</i>		<i>DO</i>
<i>RT-10115</i>	<i>Johnson Creek W of Harbor Island 1.75 M SW of West end of US21 bridge over Johnston Ck</i>	<i>Aquatic life</i>	<i>turbidity</i>
<i>RT-02015</i>	<i>Tidal Creek near confluence of Coosaw and Bull rivers Chisolm Island</i>	<i>Aquatic life</i>	<i>CU, turbidity</i>
<i>14-02</i>	<i>Campbell Creek at Whale Branch</i>	<i>Shellfish</i>	<i>FC</i>
<i>14-13A</i>	<i>First split on Halfmoon Creek on Southern side of Brown's Island</i>	<i>Shellfish</i>	<i>FC</i>
<i>RO-14354</i>	<i>Johnson Cr approx 1.4 mi SSW of US 21 bridge</i>	<i>Aquatic life</i>	<i>DO</i>
<i>RT-11015</i>	<i>McCalleys Creek 2.4 M upstream of shellfish site 15-33</i>	<i>Aquatic life</i>	<i>turbidity</i>

RT-02027	Trib to Sparrow Nest Ck near Datha Island	Aquatic life	CU
RT-032033	coffin creek 0.7 mi se of confl w/morgan river	Aquatic life	turbidity
RT-16131	coffin creek approx 330 M E of the end of N Front Dr	Recreation	Entero
16A-27	Coffin Creek mouth at Morgan River	Shellfish	FC
16A-28	Coffin Creek headwaters at shrimp docks	Shellfish	FC
16A-23	Edding Cr at small Trib between stations 9 and 18	Shellfish	FC
16A-18	Edding Cr at shrimp dock	Shellfish	FC
16A-09	Edding Creek at Morgan River	Shellfish	FC
16A-30	Jenkins Cr, 500ft N of stormwater at Dataw Island golf course	Shellfish	FC
16A-38	Pine Island Creek near confluence Village Creek	Shellfish	FC
16A-19	Rock Springs Creek, Upper reaches	Shellfish	FC
RT-15106	Cowen creek 0.7 miles sw of US hwy 21 bridge over cowen creek	Recreation	Entero
RT-032022	Coffin Cr 0.7 M SE of confluence w/morgan River	Aquatic life	turbidity
RO-11314	Coosaw River, midchannel between Bull River and Combahee River, 1 M east of shellfish site 14-04	Aquatic life	turbidity
RO-02001	Coosaw River near mouth of Combahee River	Aquatic life	Turbidity
RO-02005	COOSAW RVR NEAR MOUTH OF BULL RVR	Aquatic life	CU, TURBIDITY
RO-01163	Saint Helena Sound, 7M SW of Edisto Beach	Aquatic life	turbidity
RO-09371	St Helena sound below confluence of Morgan River & Coosaw River between the tips of S	Aquatic life	turbidity
15-19	battery creek 1000ft below rabbit island	Shellfish	FC
15-26	battery creek - picket fence trib (C6-97)	Shellfish	FC
15-27	battery creek - cherry hill trib (C6-97)	Shellfish	FC
15-28	battery creek - storm water outfall under rr track (C6-97)	Shellfish	FC
15-29	battery creek - trib on r side before battery shores (C6-97)	Shellfish	FC
15-30	battery creek cottage farms community dock (C6-97)	Shellfish	FC
15-03	mouth of albergottie and brickyard creek	Shellfish	FC
15-03A	Albergottie Creek 1.0 miles upstream of station 15-03	Shellfish	FC
15-03B	Albergottie Creek 700 ft SE of MCAS hunting club fishing pier	Shellfish	FC
15-20	Capers CR SSG at penn community srvcs retreat center	Shellfish	FC
15-33	McCalley Creek - 0.5 miles upstream of 15-01a (C7-01)	Shellfish	FC
15-25	Battery Creek - Dollingwood Trib (C6-97)	Shellfish	FC
MD-007	Pocotaligo River at US 17 at Pocotaligo	Recreation	Entero
MD-007	Pocotaligo River at US 17 at Pocotaligo	Aquatic life	turbidity
14-18	Huspah Creek at Bull Point - Whale Branch POG	Shellfish	FC
14-14	Huspah Creek at railroad trestle	Shellfish	FC
14-22	eastside of ss rr swing bridge on whale branch	Shellfish	FC
17-16A	Habersham Creek above station #16, first split	Shellfish	FC
RT-16125	Habersham creek approx 835 m from shellfish site 17-16A following creek path	Recreation	Entero
17-16	Broad River at Corn Island - mouth of creek	Shellfish	FC
17-21	middle creek and whale branch, confluence	Shellfish	FC

RO-01125	Colleton River at mouth of Callawassie Cr, 4.5M N of Bluffton	Aquatic life	DO
RT-13061	Sawmill cr approx 3/4 mi from shellfish site 18-06 - confluence with colleton river	Aquatic life	DO
RO-036032	Chechessee River 1.4M SE Confluence w/Colleton R	Aquatic life	DO
RO-01146	Chechessee River, 6.5M W of Port Royal	Aquatic life	DO
RO-036034	Port Royal Sound 1.8M SW of tip of Parris Island	Aquatic life	CU
RT-06021	New River 3.4 M SSE of SC 170 Bridge over New River	Recreation	Entero
19-19B	Bend in May R nearest High Bluff of Palmetto Bluff	Shellfish	FC
19-19C	first unnamed trib leading from Gasciogne Bluff	Shellfish	FC
19-19	May River at first dock in headwaters past Bluff	Shellfish	FC
19-19A	Unnamed trib near SW corner of Casciogne Bluff	Shellfish	FC

Based upon discussions with DHEC regarding the pollutants of concern for impaired streams. DHEC provided the following comments:

1. Heavy metals (CU and HG) are likely not from the County's MS4 area.
2. DHEC will not be focusing on developing turbidity TMDLs anywhere in the state in the near future.
3. Low dissolved oxygen (DO) appears to be a naturally occurring issue in the County and low country.

With this information in mind, the County will focus impaired stream monitoring efforts on bacteria impairments (fecal coliform and enterococcus).

In an effort to understand the cause(s) of the impairments, the County is implementing a 2-pronged approach to monitor these areas: conducting baseline water quality monitoring and visual screening of outfalls.

While the TMDL for Beaufort River does not pertain to stormwater, the County has determined that monitoring water quality in the Beaufort River, Albergotti Creek and Battery Creek is necessary. These waterbodies are being monitored under the County's baseline water quality monitoring program.

The following sections describe these approaches.

6.1 Visual screening of outfalls (IDDE priority area screening, Category 2)

Section 4.2.3 of the County's SMS4 permit requires the County to develop, implement and enforce a program to detect and eliminate illicit discharges to the County's SMS4. The Illicit Discharge Detection and Elimination (IDDE) program includes a map of the system, identification of priority areas, field screening, policies and procedures for tracking and removing any found illicit discharges, and staff training. This section of the monitoring plan identifies the priority areas for field screening for 2018 – 2019. Each year, these priority areas will be evaluated to determine if new priority areas should be identified.

6.1.1 Priority area identification for IDDE Screening

Two priority areas have been identified to focus IDDE screening efforts. These areas are generally indicated in Figures 8 and 9 below and were chosen based upon the DHEC 303(d) impaired streams list

stations in these areas. The stations were impaired due to fecal coliform. Priority area 1 (see Figure 8) contains the following 303(d) listed stations:

14-18
14-14
14-02
14-13A

Priority area 2 (see Figure 9) contains the following 303(d) listed stations:

16A-23
16A-38
16A-27
16A-28
16A-18
16A-30

To begin the process of screening, a desktop analysis of each area will be conducted to determine if failing septic systems could be a cause of the impairment. The County will work with Beaufort Jasper Water and Sewer Authority (BJWSA) to understand which properties are provided with sewer and which are on septic. Parcels will then be analyzed to determine age of development, and older developed parcels will be targeted for further investigation. Investigation may include any or all of the following:

- Identifying a ditch believed to be below the septic system, grabbing stormwater samples and analyzing for fecal coliform.
- Conducting field inspections of the older development parcels to look for evidence of failing septic systems.
- Coordinating with BJWSA to identify sanitary sewer overflows in these watersheds.

Documentation of the desktop analysis and follow-up steps will be provided in the County's annual report.

Figure 8. Priority area 1

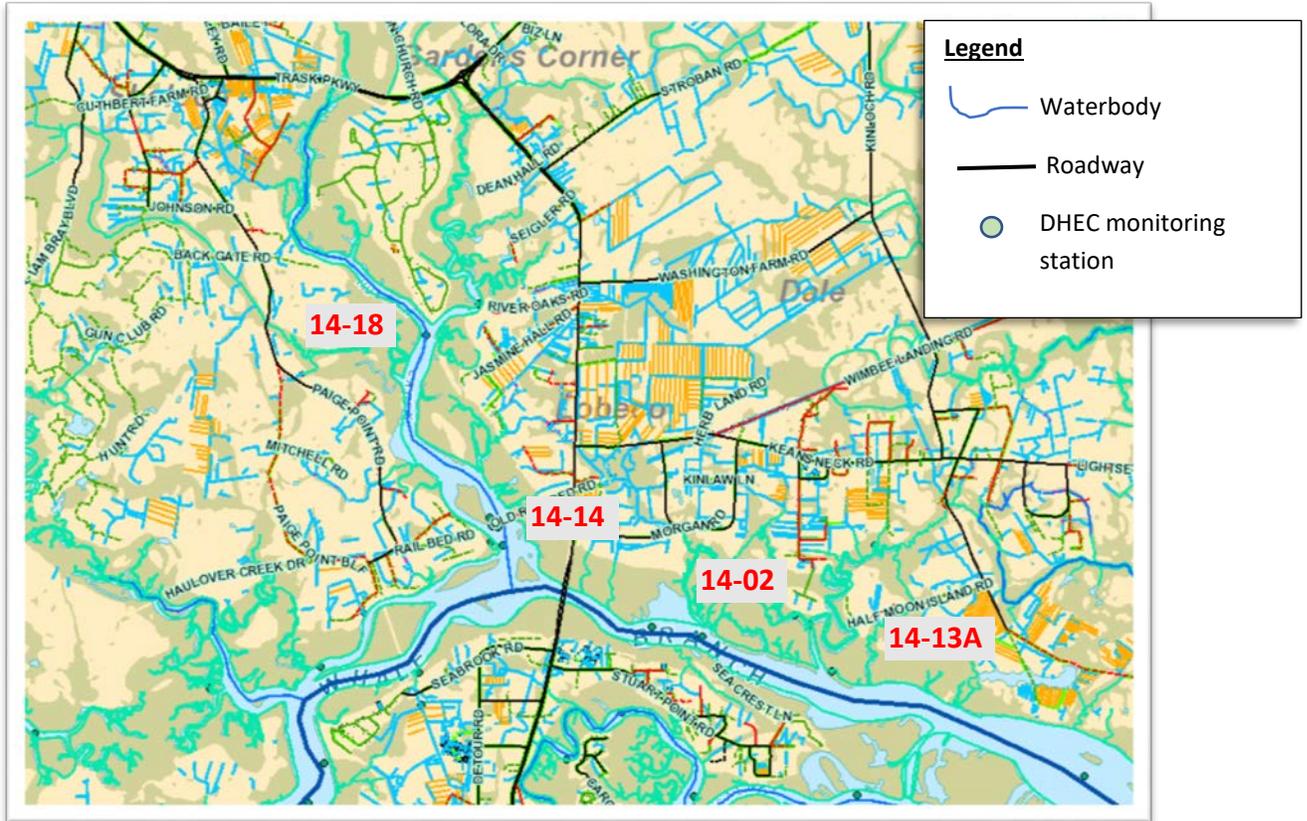
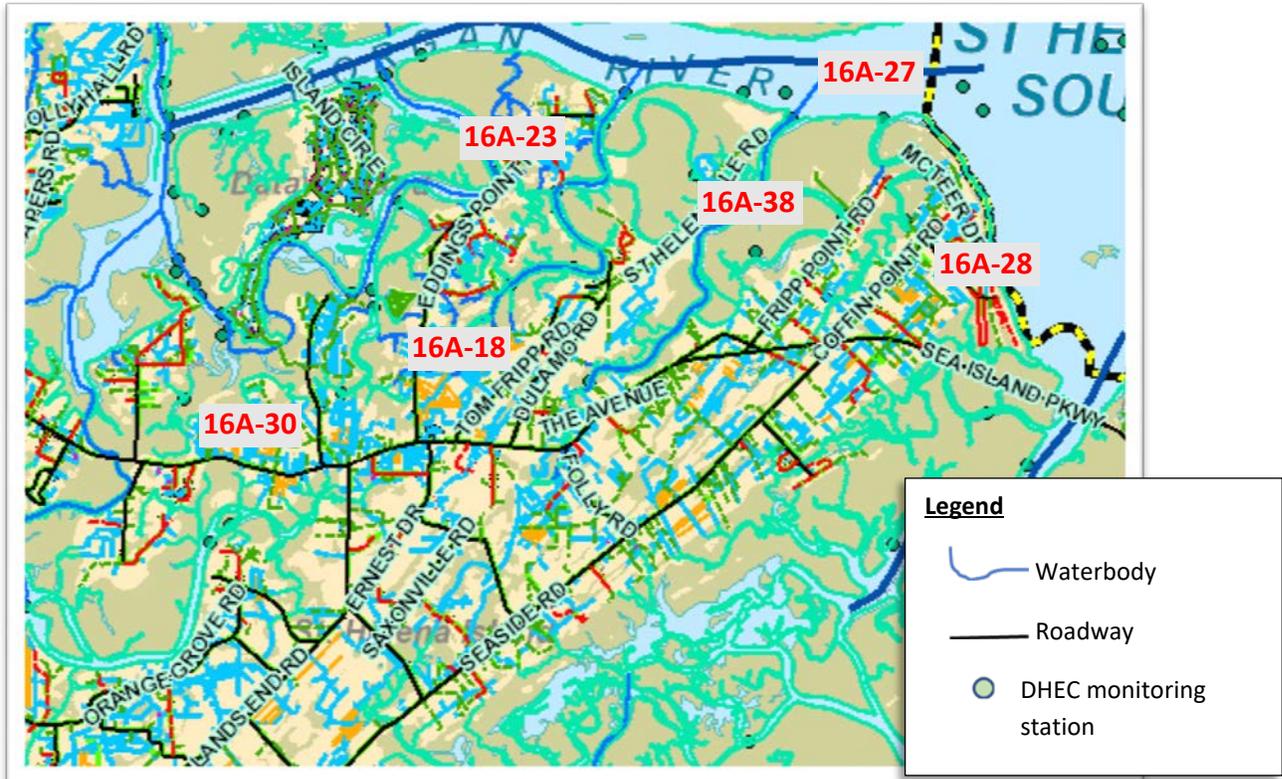


Figure 9. Priority area 2



6.1.2 IDDE program protocols

Appendix C of the Beaufort County BMP Manual contains the screening protocols and forms for the IDDE program. These protocols establish the field screening and sampling to be applied to these priority areas.

6.2 Baseline water quality monitoring of impaired streams (Category 3)

The County is conducting quarterly monitoring at the following locations in an effort to understand the County's potential impact on the receiving stream and to collect a larger dataset to aid future decisions. These monitoring points are identified in Table 7 below. Field parameters monitored during each sampling event include air temperature, water temperature, dissolved oxygen (DO), conductivity/salinity, pH, turbidity and flow. In addition, specific parameters are to be analyzed at each point as identified in the table below.

Table 7. Background water quality monitoring points for 303(d) streams

Point Name	Sample Type	Parameters to analyze	GPS location
<i>BCD-PR</i>	OF	Enterococcus	32.639401, -80.857303
<i>BCD-HC</i>	OF	Fecal coliform	32.481842, -80.7555708
<i>BCD-CR</i>	OF	Nitrate, nitrite, ammonia, fecal coliform	32.3135635, -80.8591359
<i>BCD-LM</i>	IS	Nitrate, nitrite, ammonia, fecal coliform	32.373752, -80.836215
<i>BCD-RS</i>	OF	Fecal coliform	32.442109, -80.628637
<i>BCD-YM</i>	IS	Nitrate, nitrite, ammonia, fecal coliform	32.650937, -80.687690
<i>BCBR1</i>	OF	Nitrate, nitrite, ammonia, fecal coliform	32.4095898, -80.7242011
<i>BCBR2</i>	OF	Nitrate, nitrite, ammonia, fecal coliform	32.3831697, -80.734907
<i>BCBR3</i>	OF	Nitrate, nitrite, ammonia, fecal coliform	32.270112, -80.686820
<i>BCBR4</i>	IS	Nitrate, nitrite, ammonia, fecal coliform, Entero	32.394572, -80.677906
<i>BCBR5</i>	IS	Nitrate, nitrite, ammonia, fecal coliform	32.429729, -80.670973
<i>BCBR6</i>	OF	Nitrate, nitrite, ammonia, fecal coliform	32.431819, -80.674322
<i>BCBR7</i>	OF	Nitrate, nitrite, ammonia, fecal coliform	32.440031, -80.687597
<i>New1</i>	IS	Enterococcus, mercury	32.236088, -81.013417
<i>DUP</i>	IS	E. Coli, Entero	32.379848, -80.708795
<i>Ddown</i>	IS	E. Coli	32.376107, -80.697182
<i>Warehouse</i>	IS	E. Coli	32.371361, -80.69.191984

Sands	IS	E. Coli, Entero	32.37.370011, -80.684614
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Note 1: Sample type – OF is outfall; IS is instream

All of the points in Table 7 are monitored once quarterly during wet weather. In addition, NEW1 will also be monitored at least once a quarter in dry weather (per the Bluffton MOA). In addition, BCBR4, DUP, and Sands will be sampled for enterococcus at higher frequencies during Quarters 2 and 3. Sampling protocols can be found in Section 5.6. All sample collection and analytical monitoring will be done in accordance with USCB SOP's which can be found in Appendix B. All sample analyses will be done by a lab that is certified through the SCDHEC.

6.2.1 Beaufort River monitoring

Beaufort River has a TMDL for dissolved oxygen. As outlined in section 5.2, the County's MS4 is not a contributor to that TMDL. However, the County is performing monitoring in the River to develop a baseline for water quality in the River and in its tributaries. The Beaufort County subwatersheds that drain to the TMDL watershed are depicted in Figure 10, as are County owned/maintained stormwater systems and easements. The majority of the land in the watershed is owned by the City of Beaufort, Town of Port Royal, and 2 military facilities. Properties in the unincorporated County are primarily privately owned. Street ownership is a mix of private, SCDOT, Town, City and County.

Figure 10. Beaufort River TMDL area

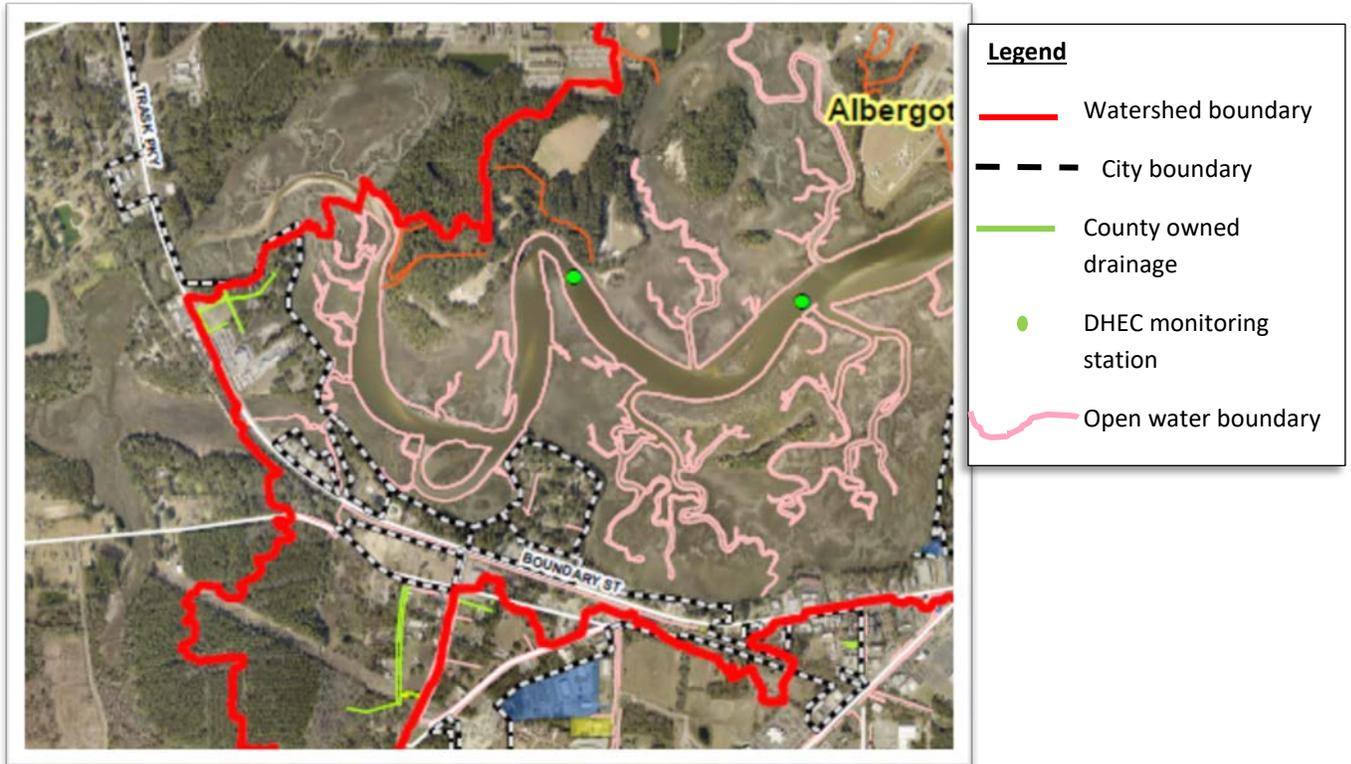


To determine monitoring locations, an analysis of the Beaufort River watershed was conducted. The analysis has been broken into 3 areas: Albergotti Creek, Battery Creek and Beaufort River.

6.2.2 Albergotti Creek.

Very little MS4 exists in the Albergotti Creek watershed, as shown in Figure 11. It should be noted that the fuzzy brown/grey areas along the creek (shown in pink) are marsh areas that are not developable and are significantly influenced by tides. As there is very little overall MS4 area in Albergotti Creek, monitoring locations were not selected in this watershed, and monitoring will not be conducted here.

Figure 11. Albergotti Creek TMDL area



6.2.3 Battery Creek.

An analysis of Battery Creek found more MS4 areas, as depicted in Figure 12. County owned/maintained stormwater system components are shown as green lines, County owned parcels are shown in yellow shading, and County stormwater easements are shown by yellow and black dashed lines. The County has chosen 4 points to monitor MS4 discharges in this subwatershed. All samples will be analyzed for the following parameters:

- Temperature
- pH
- DO
- Fecal coliform
- Nitrates
- Nitrites
- Ammonia
- Phosphorus
- In situ parameters

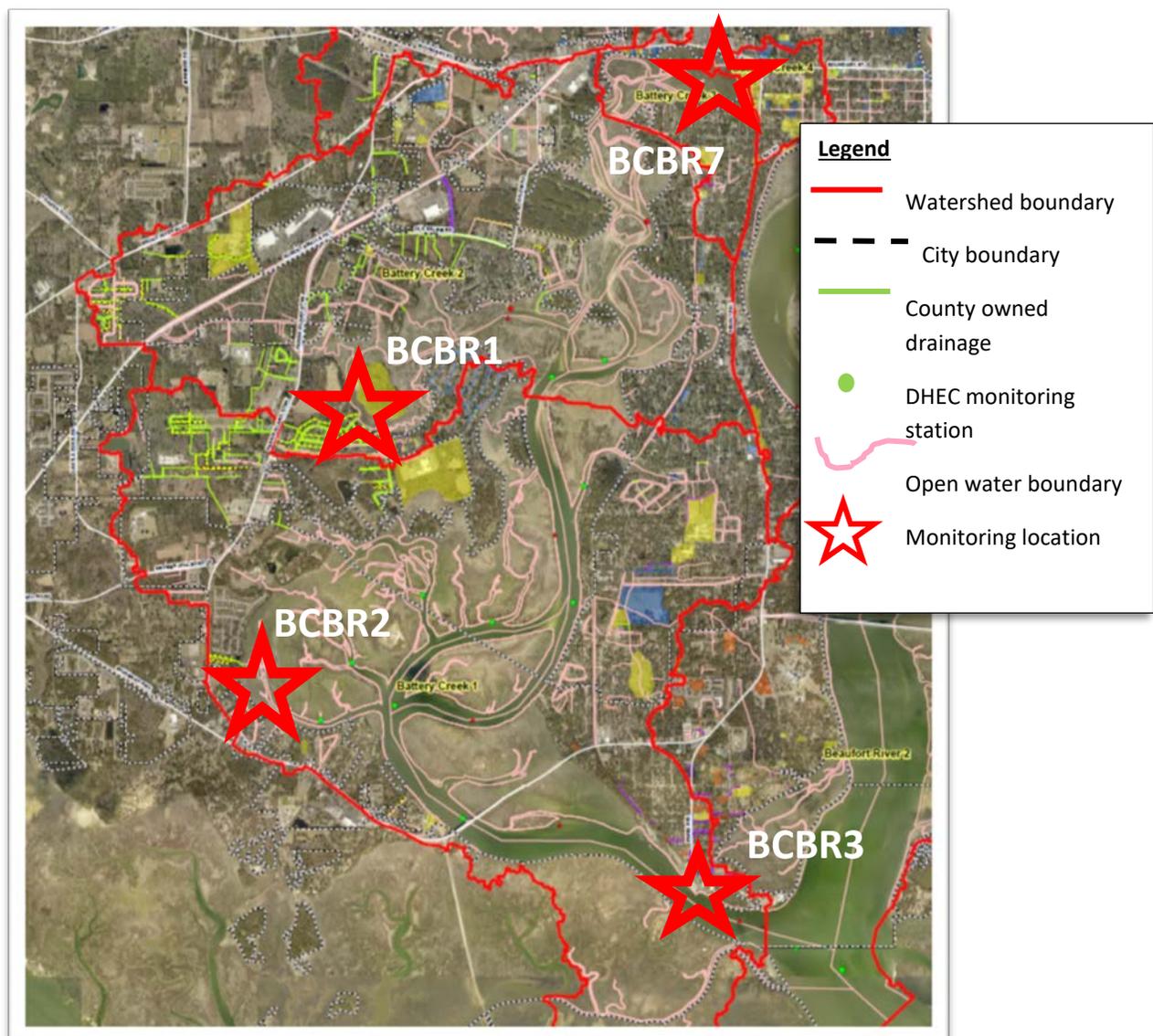
BCBR1 is located at an outfall to an area containing private residential subdivision lots in Mink Point Plantation subdivision where the County maintains the stormwater system. This monitoring point is located at the outlet of a pipe and will be representative of MS4 discharges from residential areas. Wet weather sampling only will be conducted at BCBR1, and samples will be grabbed as the tide is outgoing.

BCBR2 is located near the Savannah Highway and Parris Island Gateway road junctions at an outfall. Monitoring at this location will be during wet events, as the tide is going out.

BCBR3 is located at Sands Beach at the pier in Port Royal. This point is representative of more densely developed areas in the watershed. Monitoring at this location will be during wet events, as the tide is outgoing. It should be noted that Port Royal is also collecting samples at a redevelopment site at the same location. Those points are not shown on the map below.

BCBR7 is located at the head of Battery Creek near the County administration building complex near the intersection of Boundary Street and Marsh Road. This point is representative of high density development. Monitoring at this location will be during wet events. It is not believed that this point is tidally influenced.

Figure 12. Battery Creek TMDL Area



6.2.4 Beaufort River.

Figure 13 below identifies the section of the Beaufort River included in the TMDL, from the confluence with Albergotti Creek to the confluence with Battery Creek. The eastern side of the river has very little MS4 area. The bulk of the western side against the river has high density mixed use development. Other known dischargers in the watershed include Beaufort-Jasper Water and Sewer Authority. Three monitoring points have been selected for this subwatershed.

BCBR 4 and BCBR5 are both in stream monitoring points. BCBR4 is at the Port Royal Landing, and BCBR5 is located at the daily boat parking area.

BCBR6 is located at an outfall in downtown Beaufort close to the Bay Street parking lot.

Figure 13. Beaufort River TMDL Area

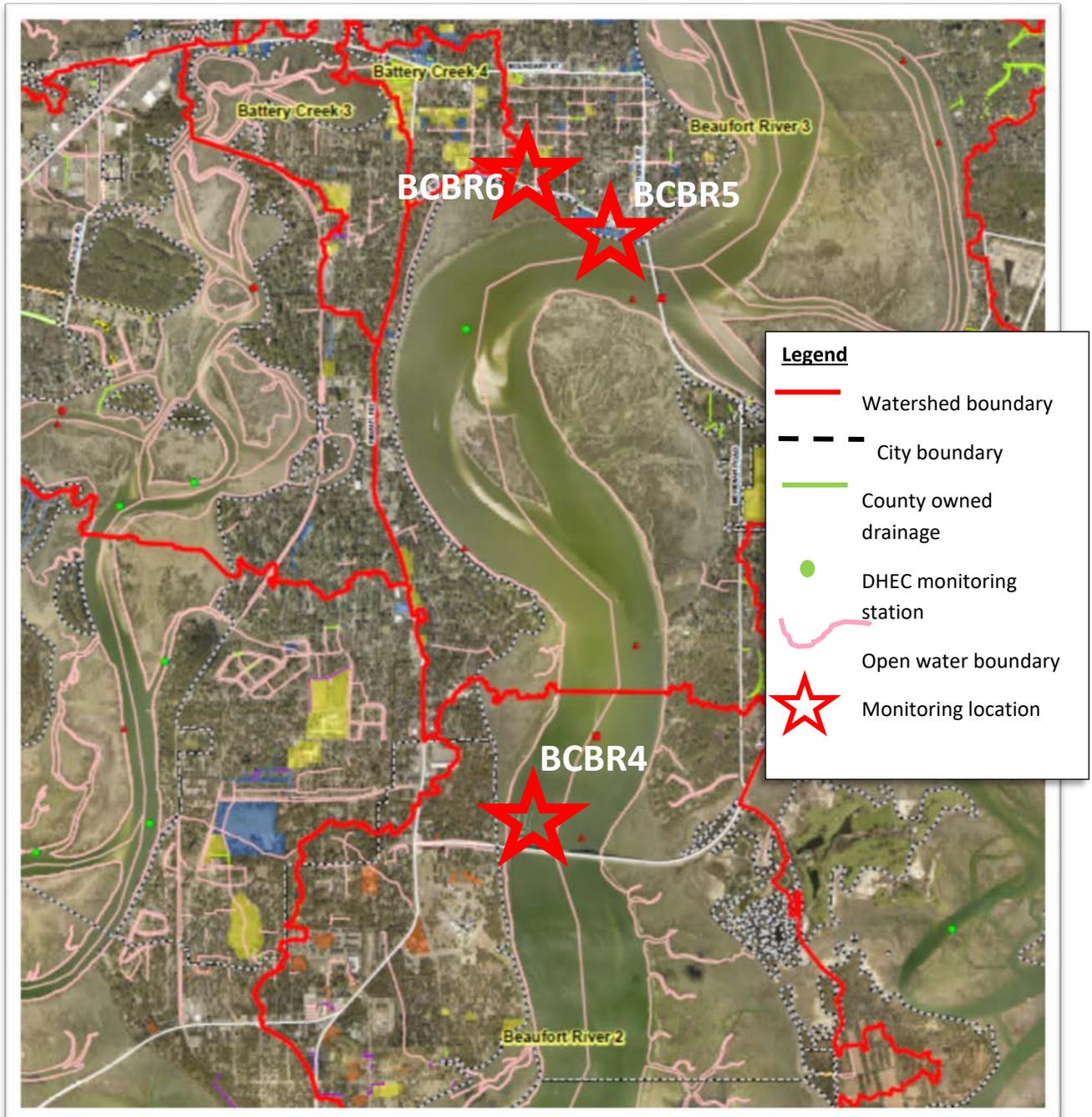
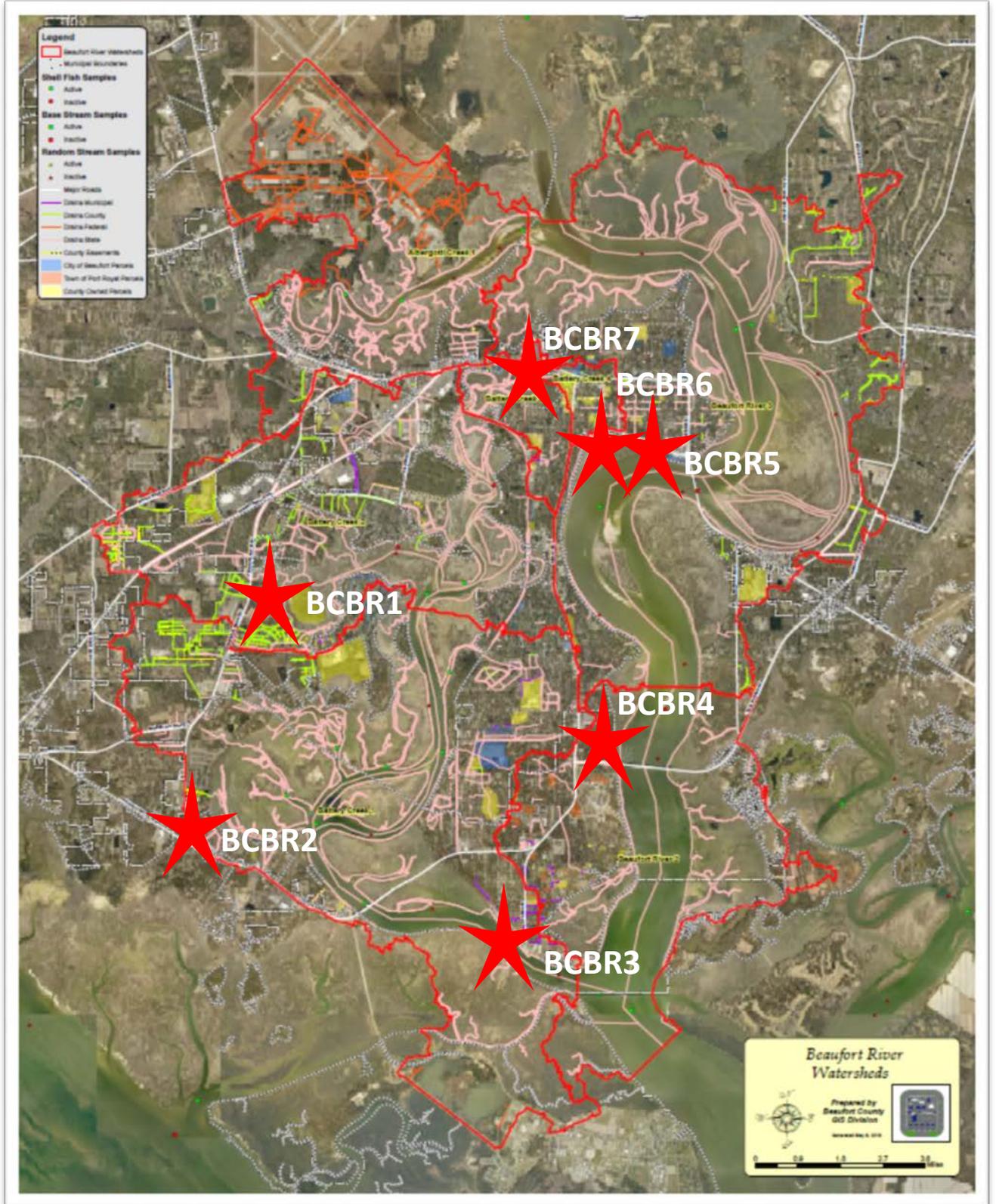


Figure 14 contains the full watershed analysis and indicates the locations of the monitoring points as red stars.

Figure 14. Analysis of Beaufort River TMDL Area



7 MOA Points (Category 4)

As indicated in Section 4 of this plan, the County has entered into agreements with the Town of Bluffton, the Town of Port Royal and the City of Beaufort. Those agreements identify monitoring points that are the responsibility of the County.

Town of Bluffton. For the Town of Bluffton, the County's monitoring stations in the Colleton and the New River watersheds are identified below:

BCCC1
 BCCC2
 BCOK1
 BCOK2
 BCOK3
 OKW3A
 NEW1 (formerly NRW01)

All of the above points are TMDL monitoring points, except NEW1. New1 is a baseline water quality monitoring station.

Town of Port Royal. For the Town of Port Royal, the County is monitoring the following outfalls in the Beaufort River watershed for baseline stormwater quality and/or special project monitoring:

BCBR2
 BCBR3

City of Beaufort. For the City of Beaufort, the County is monitoring the following Beaufort River watershed points for baseline stormwater quality:

BCBR5
 BCBR6
 BCBR4

8 Special Project Monitoring (Category 5)

The County has identified monitoring needs at several projects to determine the effectiveness of BMPs. Field parameters monitored during each sampling event include air temperature, water temperature, dissolved oxygen (DO), conductivity/salinity, pH, turbidity and flow. In addition, specific parameters are to be analyzed at each point as identified in Table 8 below.

Table 8. Special project monitoring points

County monitoring point name	Project	Parameters to analyze	Description	GPS
WMP-IN	Walmart Pond	FC	Inlet at rain garden area, parking lot	32.257065, -80.855629

<i>WMP-OUT</i>	Walmart Pond	FC	Outfall Structure	32.26012500, -80.85723963
<i>WMP-WET</i>	Walmart Pond	FC	Wetland input before road	32.258872026, -80.86701481
<i>WMP-278</i>	Walmart Pond	FC	Outfall from Wetland and Pond, converging near road	32.26186678, -80.85459706
<i>BL#4IN</i>	Barrel Landing Pond	FC	Inlet	32.29447173, -80.93433199
<i>BL#4OUT</i>	Barrel Landing Pond	FC	Outfall	32.294560, -80.933913
<i>BL#3IN</i>	Barrel Landing Pond	FC	Inlet	32.290441, -80.931489
<i>BL#3OUT</i>	Barrel Landing Pond	FC	Outfall	32.290229, -80.930990
<i>CW-01</i>	Cypress Wetland	E.coli, N, P	Outfall	32.382336, -80.690843
<i>CW-01A</i>	Cypress Wetland	E.coli, N, P	Outfall	32.382013, -80.689307
<i>CW-02</i>	Cypress Wetland	E.coli, N, P	Outfall	32.381014, -80.690150
<i>CW-03</i>	Cypress Wetland	E.coli, N, P	Outfall	32.378182, -80.689059
<i>CS-03A</i>	Cypress Wetland	E.coli, N, P	Outfall	32.377754, -80.689542
<i>OKWP1</i>	Okatie West Pond	FC	Instream	32.279640, -80.940851
<i>OKWPBOX</i>	Okatie West Pond	FC	Outfall	32.278723, -80.9401380
<i>OKWPBG</i>	Okatie West Pond	FC	Outfall	32.278726, -80.9401440
<i>OKWPOUT</i>	Okatie West Pond	FC	Outfall	32.279741, -80.9405856
<i>OKWP3</i>	Okatie West Pond	FC	Instream	32.2827, -80.9338
<i>SCPIN</i>	Salt Creek Pond	FC,Ecoli	Outfall	TBD
<i>SCPOUT</i>	Salt Creek Pond	FC,Ecoli	Outfall	TBD
<i>SHPOX1</i>	Shanklin Pond	FC,Ecoli	Outfall	TBD
<i>SHPOX2</i>	Shanklin Pond	FC,Ecoli	Outfall	TBD
<i>SHPIN</i>	Shanklin Pond	FC,Ecoli	Outfall	TBD
<i>SHPOUT</i>	Shanklin Pond	FC,Ecoli	Outfall	TBD
<i>SMPIN</i>	Sawmill Creek Pond	FC,Ecoli	Outfall	TBD
<i>SMPOUT</i>	Sawmill Creek Pond	FC,Ecoli	Outfall	TBD
<i>BMPRGIN</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPRGOUT</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPIDIN</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPIDOUT</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPPCIN</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPPCOUT</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPTBIN</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD

<i>BMPTBOUT</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPHSIN</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD
<i>BMPHSOUT</i>	Brewer Memorial Park	FC,Ecoli	Outfall	TBD

Port Royal is monitoring two locations: the downtown redevelopment project and Cypress Wetlands. This special monitoring project locations are shown below.

Figure 15. Redevelopment Project Monitoring Locations

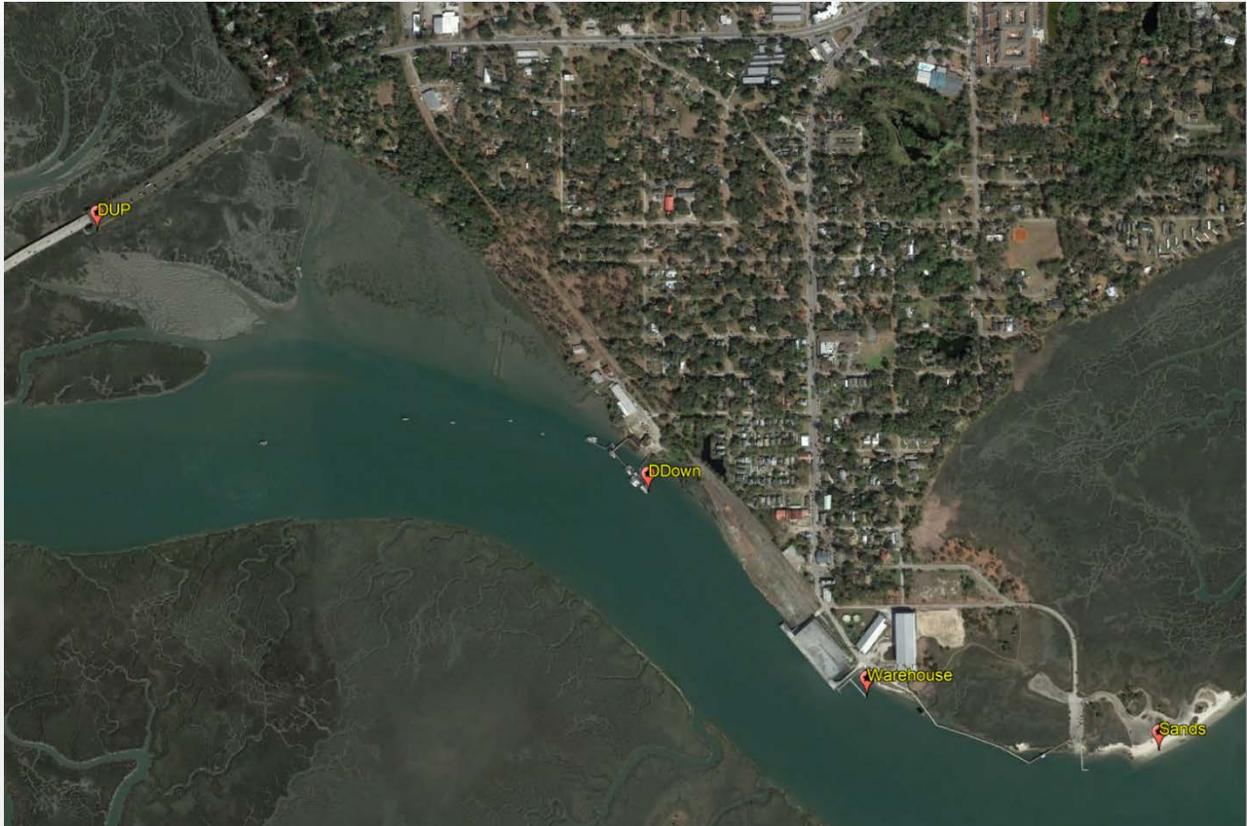
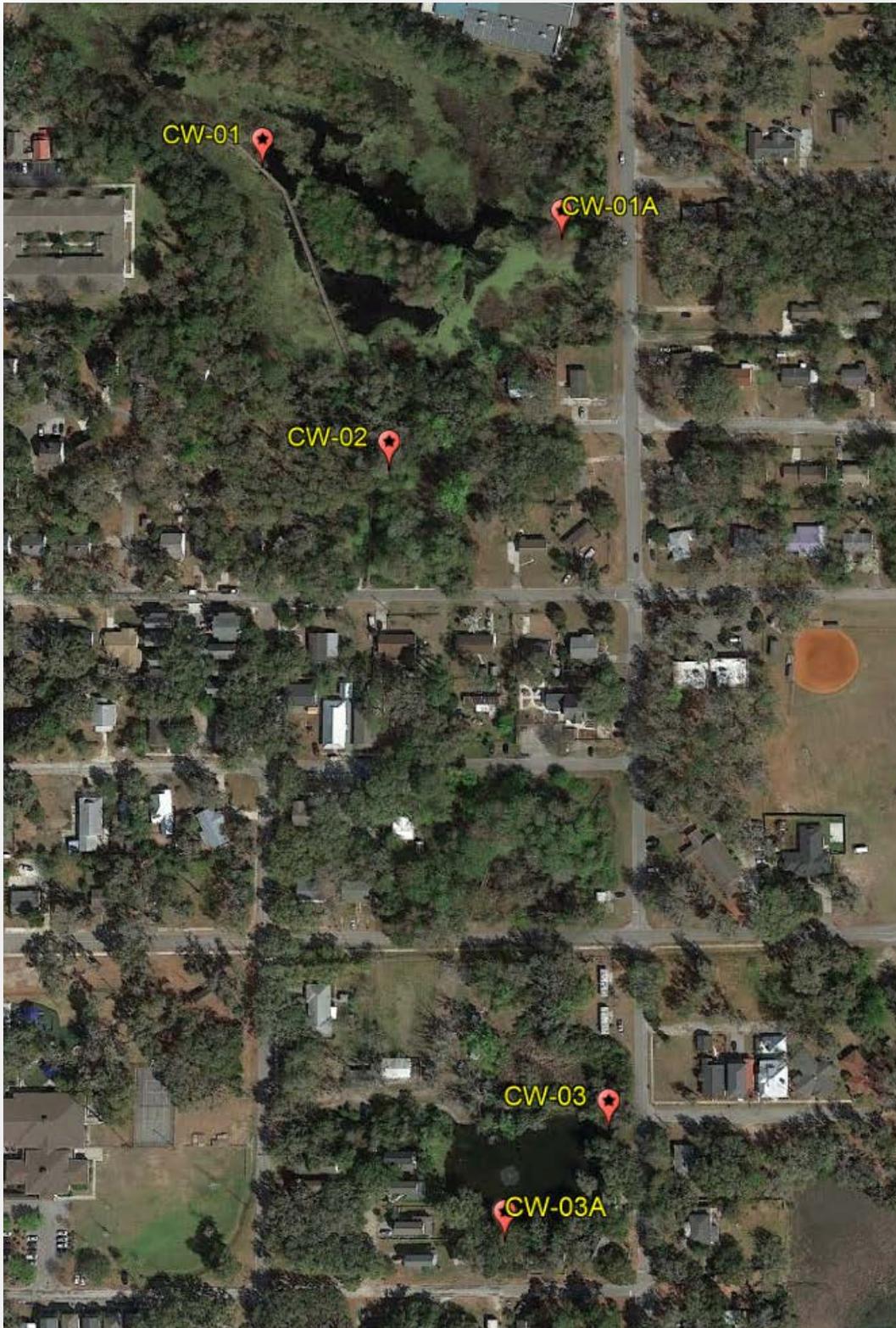


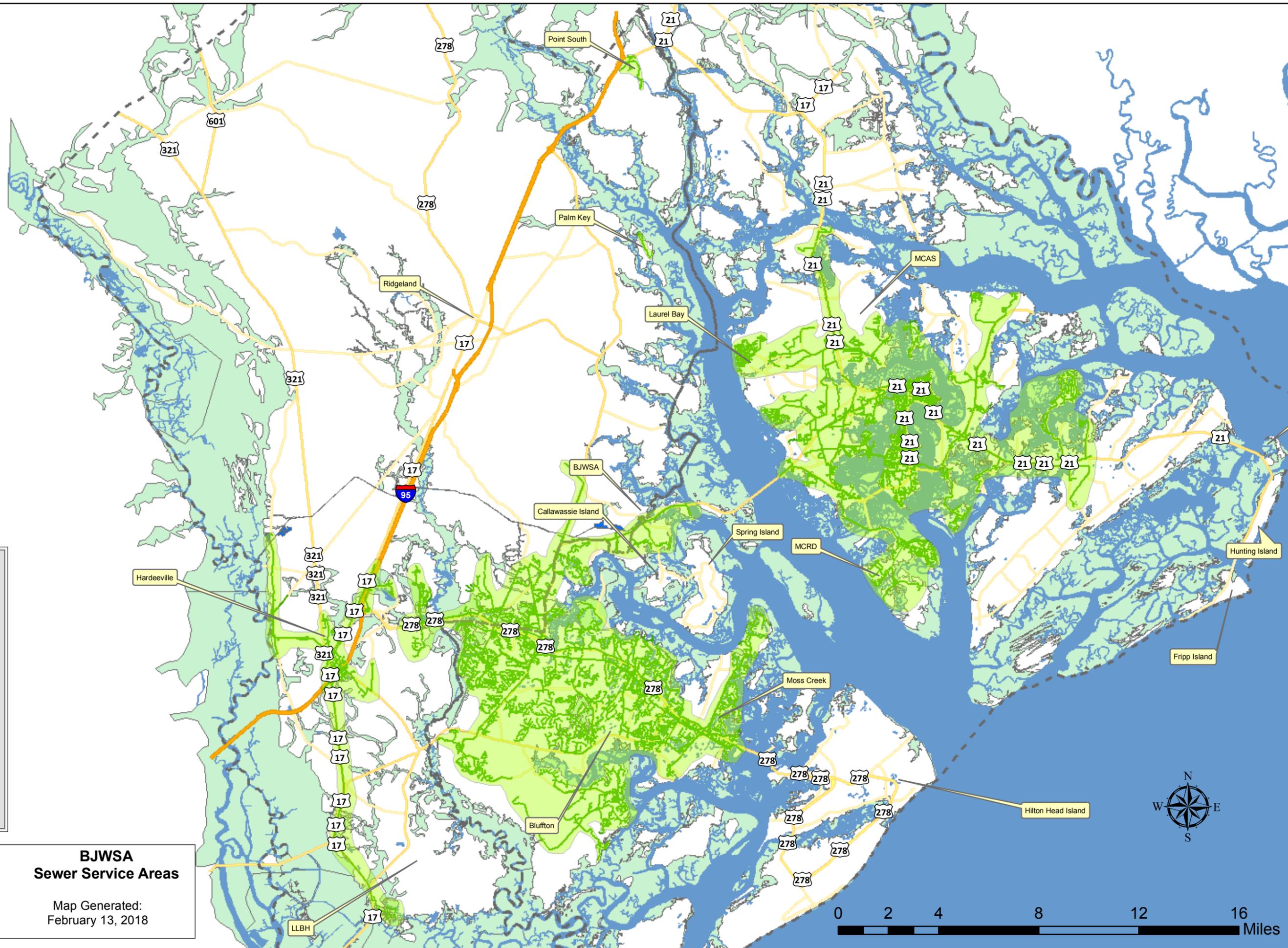
Figure 16. Cypress Wetland Monitoring Locations



8.1 Schedule

Special project monitoring schedules are set for each project and may differ from project to project.

9 Appendices



Sewer Service
 Canal
 County Boundaries
Primary Roads
CLASS
 Interstate
 US_Hwy
 State_Hwy
 State
 Local_Arterial
 Water
 Wetlands

**BJWSA
Sewer Service Areas**

Map Generated:
February 13, 2018



STANDARD OPERATING PROCEDURE FOR THE COLLECTION OF AMBIENT WATER SAMPLES

The University of South Carolina
Water Quality Laboratory
1 University Boulevard
Bluffton, S.C. 29909

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1.0 SCOPE AND APPLICATION

1.1 This Standard Operating Procedure (SOP) is applicable to the collection of representative samples from marine estuary rivers and streams, and fresh water lakes, ponds and streams.

2.0 SUMMARY OF METHOD

2.1 This SOP describes the procedures for the collection of representative water samples from: a boat, along the shore, in beach surf, from a bridge using an extension pole, sterile bucket or a depth-integrated device. This method assumes that the sampling parameters are uniformly distributed in the water column.

3.0 INTERFERENCES

3.1 Interference may result from using contaminated equipment, solvents, reagents, sample container, or sampling in a disturbed area.

3.2 Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment. Clean and decontaminate all sampling equipment prior to use. Follow the appropriate cleaning procedure for the parameters being sampled.

4.0 SAFETY

4.1 All proper personal protection clothing and equipment must be worn.

4.2 All sampling involving hazardous material or hazardous conditions (i.e. sampling material, sample preservatives) must be performed with at least two people.

4.3 When working with potentially hazardous materials or situations, follow EPA, OSHA, and site specific health or safety procedures. If a site has a known hazardous chemical present on site, review all chemical data including exposure guidelines and Material Data Safety Sheets (MSDS) before visiting the site.

4.4 When sampling lagoons or surface impoundments, the sampling team member(s) collecting the sample should not get too close to the edge of the impoundment, where bank failure may cause them to lose their balance.

4.5 Follow all boating safety rules designated for South Carolina when conducting sampling from a boat.

4.6 When preserving samples, all proper personal protection clothing and equipment is to be worn. At a minimal this will include closed-toed shoes, safety glasses and impervious gloves. Clean water and baking soda should be available for rinsing and neutralizing acids.

4.7 When working with potential hazardous chemicals or biological agents, avoid inhalation, skin contact, eye contact or ingestion. If skin contact occurs remove contaminated clothing immediately. Wash the affected areas thoroughly with large amounts of soap and water. If inhalation, eye contact or ingestion occurs, consult the Material Data Safety Sheets (MSDS) for prompt action, and in all cases seek medical attention immediately.

4.8 When sample handling is complete, wash your hands thoroughly.

5.0 EQUIPMENT AND SUPPLIES

5.1 Sampling collection equipment (Watermark Horizontal sampler, dip sampler, sampling pole, sampling bucket or bailer)

5.2 Hip waders, boots

5.3 Motor vehicle, water vessel, or other appropriate transportation.

5.4 Appropriate clean impervious gloves

5.5 Pre-cleaned and preserved sampling bottles (Refer to 40 CFR Part 136.3 (e) Table II, the laboratory's request form, the analytical method for the proper preservative, bottle type and size or the Sample Container, Preservation, Hold Time Table (WQL Table Form 005)-See attachment 2.

5.6 Whirl-Pak or Zip lock plastic bags

5.7 Coolers with ice

6.0 REAGENTS AND STANDARDS

6.1 Reference SOP WPGP Sample Containers, Preservation, Holding Times.

7.0 SAMPLE COLLECTION, PRESERVATION, AND STORAGE

7.1 Reference attachment 2- Sample Container, Preservation, Hold Time Table (WQL Table Form 005) and the SOP WPGP Sample Containers, Preservation, Holding Times.

7.2 All sampling sites shall document the location with latitude and longitude using Global Positioning System (GPS). Other methods of locating and documenting sampling sites may use topo maps, nautical charts, buoys and any specific landmarks that identify and mark sampling locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.

7.3 While in the performance of preparing and collecting any water quality samples, all personnel participating in these processes will adhere to all safety precautions and follow all established SOP pertaining to proper sample handling.

7.4 All sampling containers will prescribe to standard methods and established SOP for proper preservation of collected samples. Refer to 40 CFR Part 136.3 (e) Table II, Sample Container, Preservation, Hold Time Table (WQL Table Form 005)-See attachment 2 or the analytical method for the proper preservative and amount.

7.5 Safety glasses, appropriate impervious gloves and other necessary safety equipment shall be utilized. Sufficient amount of neutralizing agent and rinse water shall be readily available.

7.6 Once the sample has been preserved properly, cap the container. For microbiological samples, place the container in a Whirl-Pak or zip-lock plastic bag.

7.7 All samples collected in the field must be immediately placed under temperature control inside the transport container (Cooler) filled with an adequate amount of ice to maintain a temperature according to method and Sample Container, Preservation, Hold Time Table (WQL Table Form 005). A QC temperature blank will kept inside each cooler.

7.8 Load all the sample containers into cooler(s) ensuring that the bottles are in the ice in an upright position.

7.9 All collected water samples will be transported back to the laboratory in designated coolers and processed for analysis. Hold time(s) for specific sample analysis is found on the Sample Container, Preservation, Hold Time Table (WQL Table Form 005)

7.10 All samples collected in the field will maintain a Chain of Custody/Field Data Sheet that has all the proper information clearly recorded including the date, time, station number, sampling number and sample conditions for induction into the laboratory and sample record logbook. Follow SOP WQGP Chain of Custody.

8.0 PERFORMANCE CRITERIA AND QUALITY ASSURANCE

8.1 Performance Criteria

8.1.1 Follow SOP WQGP Chain of Custody.

8.1.2 At a minimum enter the following information on the Chain of Custody form: sampling date, sampling time, station number, sample numbers, project name, number of containers per station/sample number, type of analyses, type of sample (composite or grab), and samplers signatures.

8.1.3 Chain of custody forms should stay with the samples at all times. When samples are not in custody of the sampler or designated person (who signs the form) they should be maintained under lock and key.

8.1.4 For investigations or custody sensitive samples attach a custody seals to the cooler prior to shipment to another laboratory.

8.2 Quality Control/Quality Assurance

8.2.1 Representative samples are required. The sampler will evaluate the site-specific conditions to assure the sample will be representative.

8.2.2 All sampling equipment must be completely decontaminated prior to and after use.

8.2.3 Between each station sampling equipment (i.e. buckets, depth sampler and depth integrated sampler) shall be washed with a phosphate free soap and rinsed three times with distilled water. If sampling vertical profiles at the same station, sampling equipment will not be washed unless deemed necessary by the project data quality objectives.

9.0 CALIBRATION

9.1 Any thermometers used to measure temperature blanks are checked for accuracy yearly using a NIST traceable reference thermometer.

9.2 All NIST traceable reference thermometers must be recalibrated and re-certified every five years by an ISO 17025 accredited outside vendor (INNOCAL).

10.0 PROCEDURE

10.1 Pre-sample Collection

10.1.1 Determine the number of samples, site locations, the sampling methods to be employed, and which equipment and supplies are needed.

10.1.2 Decontaminate or pre-clean equipment, and ensure that it is in working condition.

10.1.3 Prepare a schedule and coordinate with the staff, clients, and laboratory.

10.1.4 Use GPS, topography maps, nautical charts, buoys and any specific landmarks to identify and mark all sampling locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.

10.2 Sample Collection

10.2.1 When collecting samples, the field location should be recorded using Global Positioning System (GPS). The date and time of sample collection, field measurements and ambient conditions must be recorded.

10.3 Sample Collection From a Boat

10.3.1 Approach the sampling point from a downstream or down-wind position and then motor slowly toward the sampling point. The motor should be turned off prior to reaching the sampling location and the boat allowed coasting a short distance to the sampling point to prevent disturbance of bottom sediment.

10.3.2 Allow the boat to come to a complete stop, drift into anchored position before beginning sampling. If necessary, lower the anchor slowly to prevent bottom sediments from being disturbed. Adjust the position of the boat back to the sampling location if drift or heavy tidal flow occurs.

10.3.3 Prepare the sample bottles. If not already done, label the sample bottles with at least, the site ID, with a permanent marker or waterproof sticker.

10.3.4 The member of the team who will be doing sampling will don new “powder free” polyethylene, PVC, or nitrile gloves.

10.3.5 Remove sample container cap. Plunge container quickly through water surface to avoid surface scum. If there is significant surface scum, record this in the field notes and use a swirling motion to clear it before plunging the bottle. The sampler will submerge the container 0.3 meters (approximately 12-18 inches) and allow the container to fill. Bacteriological samples must have air space in the top of the sample container.

10.3.6 Bring bottle up and immediately cap container.

10.3.7 An alternative to this method is to submerge capped container to 0.3 meters and then remove cap, allowing container to fill, and then recapping at the same depth.

10.4 Sample Collection from Shore

10.4.1 Prepare the sample bottles. If not already done, label the sample bottles with at least, the site ID using a permanent marker or waterproof sticker.

10.4.2 Identify the proper sampling location that will be sampled without entering the water.

10.4.3 Where there is flow or current always approach the sampling location slowly from downstream or down wind.

10.4.4 The member of the team who will be doing sampling will don new “powder free” polyethylene, PVC, or nitrile gloves.

10.4.5 Remove sample container cap. Reaching up stream or up-current plunge the container quickly through water surface to avoid surface scum. If there is significant surface scum, record this in the field notes and use a swirling motion to clear it before plunging the bottle. The sampler will submerge the container 0.3 meters (12 to 18 inches) and allow the container to fill. Avoid contacting the sample bottle with the bottom, stream bank, adjacent rocks and stream debris. If the water depth is less than 0.3 meters, sample the water at mid depth. Bacteriological samples must have a small amount of air space in the top of the sample container for mixing in the laboratory.

10.4.6 Bring bottle up and immediately cap container.

10.4.7 An alternative to this method is to submerge capped container to 0.3 meters and then remove cap, allowing container to fill, then recapping at the same depth.

10.5 Sample Collection into Beach Surf

10.5.1 Prepare the sample bottles. If not already done, label the sample bottles with at least, the site ID using a permanent marker or waterproof sticker.

10.5.2 Identify the proper sampling location that will be sampled without entering the water.

10.5.3 Wade into the surf to approximately 18 inches of water.

10.5.4 The member of the team who will be doing sampling will don new “powder free” polyethylene, PVC, or nitrile gloves.

10.5.5 Remove sample container cap. Reaching into on-coming wave by hand or with an extension pole and collect the sample in between the crest of the waves (within the trough of the wave) and plunge the container quickly through water surface. The sampler will submerge the container 0.3 meters (12-18 inches) and allow the container to fill. Avoid contacting the sample bottle with the bottom, stream bank, adjacent rocks and stream debris. If the water depth is less than 0.3 meters, sample the water at mid depth. Bacteriological samples must have a small amount of air space in the top of the sample container for mixing in the laboratory.

10.5.6 Bring bottle up and immediately cap container.

10.5.7 An alternative to this method is to submerge capped container to 0.3 meters and then remove cap, allowing container to fill, and then recapping at the same depth.

10.6 Sample Collection Using a Bucket

10.6.1 This method may only be used for bacteria analysis if the bucket has been adequately sterilized and maintained sterile. The analytic standard method will dictate the type of bucket that may be used and therefore the proper decontamination procedure will be applied. At a minimum this would be with a phosphate free soap and rinsed three times with distilled water. The bucket should then be placed in a sterile bag or covered with aluminum foil to protect it from contamination.

10.6.2 Prepare the sample bottles. If not already done, label the sample bottles with at least the site ID using a permanent marker or waterproof sticker.

10.6.3 Identify the proper sampling location that will be sampled without entering the water.

10.6.4 Where there is flow or current always sample on the upstream side of the bridge or structure.

10.6.5 The member of the team who will be doing sampling will don new “powder free” polyethylene, PVC, or nitrile gloves.

10.6.6 Locate the pre-cleaned bucket and rope.

10.6.7 Lower the bucket slowly to the water. To prevent particles or bridge material from entering the bucket, do not allow the rope or the bucket to touch the bridge structure.

10.6.8 Allow the bucket to fill at least 1/3 of the way full and raise the bucket slowly so that it does not contact anything on the way up. Coil the rope in your hand or on a cleaned surface (i.e. a clean plastic bag). This is performed to prevent particles from gathering on the rope and eventually dropping in the bucket.

10.6.9 Once the bucket has been raised, swirl the water in the bucket so it has contacted all inside surfaces. Empty the bucket so that it doesn't disturb the water to be sampled.

10.6.10 Lower the bucket slowly to the water. To prevent particles or bridge material from entering the bucket, do not allow the rope or the bucket to touch the bridge structure.

10.6.11 Allow the bucket to fill to provide enough volume to fill all sample containers then raise the bucket slowly so that it does not contact anything on the way up. Coil the rope in your hand or on a cleaned surface (i.e. a clean plastic bag). This is performed to prevent particles from gathering on the rope and eventually dropping in the bucket.

10.6.12 Once the bucket is raised, uncap all sampling containers.

10.6.13 Swirl the water in the bucket so it is well mixed.

10.6.14 Fill up all sampling containers.

10.6.15 Between each station wash the bucket with a phosphate free soap and rinse three times with distilled water. To prevent contamination, do not store the rope in the bucket.

10.7 Sample Collection at Depth (Use of horizontal bottle)

10.7.1 This method may not be used for bacteria analysis unless the depth-sampler has been adequately sterilized and maintained sterile. For bacteria a new sterile depth-sampler is required at each site. The depth-sampler should be cleaned properly for the particular analysis required. At a minimum this would be with a phosphate free soap and rinsed three times with distilled water.

10.7.2 Prepare the sample bottles. If not already done, label the sample bottles with at a minimum, the site ID using a permanent marker or waterproof sticker.

10.7.3 Identify the proper sampling location that may be sampled without entering the water.

10.7.4 Where there is flow or current always sample on the upstream side of the bridge, structure.

10.7.5 The member of the team who will be doing sampling will don new “powder free” polyethylene, PVC, or nitrile gloves.

10.7.6 Locate the pre-cleaned depth-sampler.

10.7.7 Lower the depth-sampler slowly to the desired depth.

10.7.8 Move the sampling rope several times side to side, to allow the water at depth to enter the sampler.

10.7.9 Drop the messenger to trigger the depth-sampler.

10.7.10 Raised the depth-sampler.

10.7.11 Remove the caps from all sample bottles

10.7.12 Shake or swirl the water in the depth-sampler

10.7.13 Fill up all sampling containers.

10.7.14 Between each station wash the depth-sampler with a phosphate free soap and rinse three times with distilled water.

10.8 Sample Collection Depth-integrated (Use of a Teflon bailer)

10.8.1 This method refers to collecting depth-integrated samples by use of a Teflon bailer. This method may not be used for bacteria analysis unless the bailer has been adequately sterilized and maintained sterile. For bacteria, a new sterile bailer is required at each site where pre-rinsing can be performed. The bailer should be cleaned properly for the particular analysis required. At a minimum this would be with a phosphate free soap and rinsed three times with distilled water.

10.8.2 Prepare the sample bottles. If not already done, label the sample bottles with at a minimum, the site ID using a permanent marker or waterproof sticker.

10.8.3 Identify the proper sampling location that may be sampled without entering the water.

10.8.4 Where there is flow or current always sample on the upstream side of the bridge, structure or boat.

10.8.5 The member of the team who will be doing sampling will don new “powder free” polyethylene, PVC, or nitrile gloves.

10.8.6 Locate the pre-cleaned Teflon bailer.

10.8.7 Lower the bailer slowly until the top of bailer is at the water’s surface.

10.8.8 Raise the bailer.

10.8.9 Empty the bailer so that it doesn’t disturb the water to be sampled (At least 5 feet away from the sample collection location).

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10.8.10 Lower the bailer slowly until the top of bailer is at the water’s surface.

10.8.11 Raise the bailer.

10.8.12 Remove the caps from all sample bottles.

10.8.13 Mix the water in the bailer by putting you gloved finger of the top of the bailer and turning it upside down and then right-side up 3 times.

10.8.14 Fill up all sampling containers.

11.0 CALCULATIONS AND DATA REPORTING

11.1 No calculations are required for the collection of field data or water quality sampling in the field.

11.2 All field data will be recorded and reported utilizing the field data sheet and Chain-of-Custody logbook. Reference SOP WQGP Chain of Custody.

11.3 The chain of custody form is signed over to the laboratory.

11.4 The sampling data is stored at USCB Water Quality Laboratory located at 1 University Blvd, Bluffton, SC for at least 3 years.

11.5 Containers used for sampling must including the proper preservatives, maintain holding times, and shall be collected in the specific container types outlined in attachment 2.

11.6 Samples must be kept cool during shipment/transport to the laboratories with ice.

11.7 The USCB's Water Quality Laboratory personnel are responsible for providing containers, dispensing preservation materials, and providing proper handling instructions to sample collectors.

11.8 Maximum holding times have been set by the United States Environmental Protection Agency (USEPA) for each parameter. Be sure not to exceed the maximum holding time for valid results.

11.9 If sample exceeds the maximum holding time for a parameter, the analyst shall record in the workbook and report on the data sheet with the notation "sample analysis exceeded maximum holding time". A comment should also be recorded in the sample comments form for all sampling logbooks that are maintained in the laboratory.

11.10 If determined that any pre-dispensed preservation was lost or known equipment failure/problem issues have occurred, the comment "lab error", or "instrument failure/problem", or "analytical problem" shall be included in workbooks and logbooks.

11.11 The sampling data is stored in the USCB Water Quality Laboratory located at 1 University Blvd, Bluffton, SC for at least 3 years.

12.0 WASTE MANAGEMENT

12.1 During field sampling and analysis events there may be hazardous waste produced from the sample collection. The waste must be handled and disposed of in accordance with federal, state, and municipal regulations. Dispose of the site specific hazardous waste produced where the work was performed, if the operating site has proper disposal available. If there is no disposal that meets regulatory requirements, the waste must be

transported back to the USCB Water Quality Laboratory and transferred to the hazardous waste manager for proper disposal. The sample volume should be minimized to reduce unnecessary waste.

13.0 REFERENCES

13.1 40 CFR, Part 136. Guidelines Establishing Test Procedures for the Analysis of Pollutants. Federal Water Pollution Control Act Amendments, amended CWA of 1977.

13.2 South Carolina Department of Health and Environmental Control (2014). Laboratory Certification Program, Guidance Documents. Bureau of Environmental Services, Environmental Quality Control Laboratory.

13.3 USCB Water Quality Lab Quality Assurance Manual (QAM).

13.4 USEPA (2014). Manual for the Certification of Laboratories Analyzing Drinking Water, Fifth Edition. Publication, EPA 815-R-05-004, January 2005. Supplement 2, EPA 815-F-12-006, November 2012.

14.0 TABLES, DIAGRAMS, FLOWCHARTS Attachment 1

Chain of Custody/Field Data Sheet (WQL Form 1000)

Attachment 2: WQL Table Form 005 - Sample Container Preservation Hold Time Table

Parameter(s)	Container ¹	Preservation	Minimum Sample Size	Maximum Holding Time
Bacterial				
Fecal Coliform	PA, G	Cool, < 8°C, 0.0008% Na ₂ S ₂ O ₃	100 mL	8 hours (Surface Waters)
Total Coliform and <i>E. Coli</i>	PA, G	Cool, < 8°C, 0.0008% Na ₂ S ₂ O ₃	100 mL	8 hours
Enterococci	PA, G	Cool, < 8°C, 0.0008% Na ₂ S ₂ O ₃	100 mL	8 hours
Nutrients Wet Chemistry				
Ammonia	P, G, FP	Cool, ≤ 6°C, H ₂ SO ₄ < pH 2	500 mL	28 days
Nitrate-Nitrite	P, G, FP	Cool, ≤ 6°C, H ₂ SO ₄ < pH 2	200 mL	28 days
Total Kjeldahl Nitrogen	P, G, FP	Cool, ≤ 6°C, H ₂ SO ₄ < pH 2	500 mL	28 days
Phosphorus, total	P, G, FP	Cool, ≤ 6°C, H ₂ SO ₄ < pH 2	100 mL	28 days
Organic Carbon	P, G(B), FP	Cool, ≤ 6°C, H ₃ PO ₄ < pH 2	100 mL	28 days
Biochemical Oxygen Demand	P, G, FP	Cool, ≤ 6°C	1000 mL	48 hours
Residue, Nonfilterable (TSS)	P, G, FP	Cool, ≤ 6°C	200 mL	7 days
Chlorophyll-a	P, G dark colored.	Unfiltered, dark, 4°C. Filtered, dark - 20°C	1000 mL	36 hours for filtration/ 28 days for filter extraction.
Metals				
Metals, Total (Cd, Cr, Cu, Fe, Pb, Mn, Ni, Zn)	P	Cool, ≤ 6°C, H ₂ SO ₄ < pH 2	250 mL	6 months
Mercury	P	Cool, ≤ 6°C, H ₂ SO ₄ < pH 2	250 mL	6 months
In Field				
SpC, DO, pH, Salinity, Temperature, Turbidity	Use probe	None Required	in-situ	Analyze immediately
WQL Table Form 005				
1. P=Polyethylene. G=Glass. FP=Fluoropolymer (polytetrafluoroethylene (PTFE), Teflon). PA=Any plastic made of sterilizable material. G(B)=Borosilicate glass.				

A	B	C	D	E	F	G	H	I	J	K	L	M
1	Monitoring type(s)	Water body or description	Point name	Type	Sample Point Owner	DHEC monitoring station	Use	POC	Parameters Analyzed*	Schedule	Notes	GPS
2	TMDL											
3	Category 1, 4	Chechessee (developed)	BCCC1	OF	County		shellfish	FC	E. Coli, Nitrate, Nitrite Ammonia, P	quarterly wet		32.3558456, -80.8641047
4	Category 1, 4	Chechessee (undeveloped)	BCCC2	OF	County		shellfish	FC	E. Coli	quarterly wet		32.3627148, -80.8509683
5	Category 1, 4	Okatie (developed)	BCOK1	IS	County		shellfish	FC	E. Coli	quarterly wet		32.280910, -80.927427
6	Category 1, 4	Okatie (undeveloped)	BCOK2	OF	County		shellfish	FC	E. Coli	quarterly wet		32.334256, -80.922064
7	Category 1, 4	Okatie (developed)	BCOK3	OF	County		shellfish	FC	E. Coli	quarterly wet		32.347974, -80.891552
8	Category 1, 4	Okatie (developed)	OKW3A	IS	County		shellfish	FC	E. Coli	quarterly wet, quarterly dry	In Bluffton MOA	32.278760 -80.945870
9	303d streams											
10	Category 1, 4	May River	MRR02	OF	Bluffton				FC, E coli, copper, total N, total P	quarterly wet, quarterly dry	In Bluffton MOA, quarterly one dry one wet; parameters updated per Beth Lewis and Katie Herrera 12-3-1	32.240785, -80.885964
11	Category 3, 4	New River	NEW1	IS	County	RT-06021		Enter, Hg	Enter, HG	quarterly wet, quarterly dry	303d stream; quarterly one dry one wet per Bluffton MOA	32.236088, -81.013417
12	Category 3	Pocotaligo River at US 17 at Pocotaligo	BCD-PR	OF	County	MD-007	REC (Stream)	Enter	Enter	quarterly wet		32.639401, -80.857303
13	Category 3	Pocotaligo River at US 17 at Pocotaligo	BCD-PR	OF	County	MD-007	AL	turbidity				
14	Category 2	Huspah Creek at Bull Point - Whale Branch POG	No point assigned			14-18	shellfish	FC				Have sewer service area map from BJWSA
15	Category 2	Huspah Creek at railroad trestle	No point assigned			14-14	Shellfish	FC				
16	Category 2	Campbell Creek at Whale Branch	No point assigned			14-02	Shellfish	FC				
17		eastside of ss rr swing bridge on whale branch	No point assigned			14-22	shellfish	FC				
18	Category 2	First split on Halfmoon Creek on Southern side of Brown's Island	No point assigned			14-13A	Shellfish	FC				
19	Category 3	Habersham Creek above station #16, first split	BCD-HC	IS	County	17-16A	Shellfish	FC	FC	quarterly wet	Same as Broad2 from monitoring plan in BMP manual	32.48118, -80.755535
20	Category 3	Habersham creek approx 835 m from shellfish	near BCD-HC	IS	County	RT-16125	REC	Enter	FC	quarterly wet	Same as Broad2 from monitoring plan in BMP manual	
21	Category 3	Broad River at Corn Island - mouth of creek	Near BCD-HC	IS	County	17-16	shellfish	FC	FC	quarterly wet	Same as Broad2 from monitoring plan in BMP manual	
22	Category 3	Colleton River at mouth of Callawassie Cr, 4.5M N of bluffton	BCD-CR	IS	County	RO-01125	AL (Stream)	DO	Nitrate, Nitrite Ammonia FC P	quarterly wet	Could monitor instream at Callawassie Drive	32.3135635, -80.8591359
23	Category 3	Chechessee River, 6.5M W of Port Royal	BCD-LM	IS	County	RO-01146	AL (Stream)	DO			Lemon Island boat ramp	32.373752, -80.836215
24	N/A	Bend in May R nearest High Bluff of Palmetto Bluff	No point assigned			19-19B	Shellfish	FC			Share info with Bluffton	
25	N/A	first unnamed trib leading from Gascoigne Bluff	No point assigned			19-19C	Shellfish	FC			Share info with Bluffton	
26	N/A	May River at first dock in headwaters past Bluff	No point assigned			19-19	Shellfish	FC			Share info with Bluffton	
27	N/A	Unnamed trib near SW corner of Gascoigne Bluff	No point assigned			19-19A	Shellfish	FC			Share info with Bluffton	
28	Category 2	coffin creek approx 330 M E of the end of N Front Dr	No point assigned		County	RT-16131	REC	Enter				
29	Category 2	Edding Creek at Morgan River	No point assigned		County	16A-09	shellfish	FC				
30	Category 2	Coffin Creek mouth at Morgan River	No point assigned		County	16A-27	shellfish	FC				
31	Category 2	Coffin Creek headwaters at shrimp docks	No point assigned		County	16A-28	shellfish	FC				
32	Category 2	Edding Cr at small Trib between stations 9 and 18	No point assigned		County	16A-23	shellfish	FC				Have sewer service area map from BJWSA
33	Category 2	Edding Cr at shrimp dock	No point assigned		County	16A-18	shellfish	FC				
34	Category 2	Jenkins Cr, 500ft N of stormwater at Dawtaw Island golf course	No point assigned		County	16A-30	shellfish	FC				
35	Category 2	Pine Island Creek near confluence Village Creek	No point assigned		County	16A-38	shellfish	FC				
36	Category 2	Cowen creek 0.7 miles sw of US hwy 21 bridge over cowen creek	No point assigned		County	RT-15106	REC	Enter				
37	N/A	WIMBEE CREEK APPROX 1 MI NW OF THE MOUTH OF SOUTH WIMBEE CREEK AND SHELLFISH SITE 14-17	No point assigned			RO-14351	AL	DO			low priority	
38	N/A	Johnson Cr approx 1.4 mi SSW of US 21 bridge	No point assigned			RO-14354	AL	DO			low priority	
39	N/A	coffin creek 0.7 mi se of confl w/morgan river	No point assigned			RT-032022	AL	turbidity			low priority	
40	N/A	Coosaw River, midchannel between Bull River and Combahee River, 1 M east of shellfish site 14-04	No point assigned			RO-11314	AL	turbidity			low priority	
41	N/A	Coosaw River near mouth of Combahee River	No point assigned			RO-02001	AL	Turbidity			low priority	

A	B	C	D	E	F	G	H	I	J	K	L	M
1	Monitoring type(s)	Water body or description	Point name	Type	Sample Point Owner	DHEC monitoring station	Use	POC	Parameters Analyzed*	Schedule	Notes	GPS
42	N/A	COOSAW RVR NEAR MOUTH OF BULL RVR	No point assigned			RO-02005	AL	CU, TURBIDITY			low priority	
43	N/A	Saint Helena Sound, 7M SW of Edisto Beach	No point assigned			RO-01163	AL	turbidity			low priority	
44	N/A	St Helena sound below confluence of Morgan River & Coosaw River between the tips of S	No point assigned			RO-09371	AL	turbidity			low priority	
45		battery creek 1000ft below rabbit island	No point assigned			15-19	shellfish	FC			BCBR5, BCBR7, DUP, Ddown, Warehouse, Sands	
46	Category 3, 4, 5	battery creek - picket fence trib (C6-97)	No point assigned			15-26	shellfish	FC			BCBR5, BCBR7, DUP, Ddown, Warehouse, Sands	
47	Category 3, 4, 5	battery creek - cherry hill trib (C6-97)	No point assigned			15-27	shellfish	FC			BCBR5, BCBR7, DUP, Ddown, Warehouse, Sands	
48	Category 3, 4, 5	battery creek - storm water outfall under rr track (C6-97)	No point assigned			15-28	shellfish	FC			BCBR5, BCBR7, DUP, Ddown, Warehouse, Sands	
49	Category 3, 4, 5	battery creek - trib on r side before battery shores (C6-97)	No point assigned			15-29	shellfish	FC			BCBR5, BCBR7, DUP, Ddown, Warehouse, Sands	
50	Category 3, 4, 5	battery creek cottage farms community dock (C6-97)	No point assigned			15-30	shellfish	FC			BCBR5, BCBR7, DUP, Ddown, Warehouse, Sands	
51	Category 3, 4, 5	mouth of albergottie and brickyard creek	No point assigned			15-03	shellfish	FC			BCBR5, BCBR7, DUP, Ddown, Warehouse, Sands	
52	N/A	Albergottie Creek 1.0 miles upstream of station 15-03	No point assigned			15-03A	shellfish	FC			Not monitoring	
53	N/A	Albergottie Creek 700 ft SE of MCAS hunting club fishing pier	No point assigned			15-03B	shellfish	FC			Not monitoring	
54	N/A	Capers CR SSG at penn community srvc retreat center	No point assigned			15-20	shellfish	FC			Not monitoring	
55	N/A	McCalley Creek - 0.5 miles upstream of 15-01a (C7-01)	No point assigned			15-33	shellfish	FC			Not monitoring	
56	N/A	middle creek and whale branch, confluence	No point assigned			17-21	shellfish	fc			Not monitoring	
57	N/A	Sawmill cr approx 3/4 mi from shellfish site 18-06 - confluence with colleton river	No point assigned			RT-13061	AL	DO			Not monitoring	
58	Category 3, 5	Rock Springs Creek, Upper reaches	BCD-RS	OF	County	16A-19	shellfish	FC	FC	quarterly wet	Special project monitoring; in and out pond monitoring	32.442109, -80.628637 (outfall). No true inlet, other than rainfall; Pond not near completion, if true inlet, will take location
59	Category 3	COMBAHEE RVR AT US 17 10 MI ESE YEMASSE	BCD-YM	IS	County	CSTL-098	AL (Stream)	DO	Nitrate, nitrite, ammonia FC P	quarterly wet	At bridge; on county line with Colleton	32.652932, -80.683649
60	Category 3, 4	Beaufort River	BCBR1	OF	County			DO	Nitrate, nitrite, ammonia FC P	quarterly wet	Mink Point	32.4095898, -80.7242011
61	Category 3, 4	Beaufort River	BCBR2	OF	County	15-25	Shellfish	DO, FC	Nitrate, nitrite, ammonia FC P	quarterly wet	Port Royal MOA, Same as DHEC 15-25, Savannah highway/Parris island junction	32.3831697, -80.734907
62	Category 3, 4	Beaufort River	BCBR3	IS	County	15-06, MD-001	Shellfish, Stream	DO	Nitrate, nitrite, ammonia, FC, P	quarterly wet	Port Royal MOA, Sands Beach	32.370383, -80.658153
63	Category 3, 4	Beaufort River	BCBR4	IS	County			DO	Nitrate, nitrite, ammonia FC P	quarterly wet	City of Beaufort MOA, Port Royal Landing. Entero sampling done quarterly (1&4), bimonthly (2&3)	32.394572, -80.677906
64	Category 3, 4	Beaufort River	BCBR6	OF	County	15-05	Shellfish	DO	Nitrate, nitrite, ammonia FC P	quarterly wet	City of Beaufort MOA, Dwntwn Beaufort, Bay street parking lot	32.431819, -80.674322
65	Category 3, 4	Beaufort River	BCBR5	IS	County	15-05	Shellfish	DO	Nitrate, nitrite, ammonia FC P	quarterly wet	City of Beaufort MOA, Dwntwn Beaufort daily boat parking	32.429729, -80.670973
66	Category 3	Battery Creek	BCBR7	OF	County	15-06	Shellfish	DO	Nitrate, nitrite, ammonia FC P	quarterly wet	County admin building	32.440031, -80.687597
67	Category 3, 4, 5	Battery Creek	DUP	IS	PR	15-06	Shellfish	E.Coli	E.Coli, Entero	quarterly wet	Bell Bridge. Entero sampling quarterly (1&4), bimonthly (2&3)	32.380000, -80.7086111
68	Category 3, 4, 5	Battery Creek	Ddown	IS	PR			E.Coli	E.Coli	quarterly wet	End of dock at 11th Street docks	32.375277, -80.696111
69	Category 3, 4, 5	Battery Creek	Warehouse	IS	PR			E.Coli	E.Coli	quarterly wet	Butler marine warehouse docks	32.371388, -80.691388
70	Category 3, 4, 5	Battery Creek	Sands	IS	PR			entero	e.Coli, entero, Nitrate, Nitrite, ammonia, P	quarterly wet	Beach. Entero sampling quarterly (1&4), bimonthly (2&3)	32.370383, -80.658153
71	Special Project											
72	Category 5	Walmart Pond	WMP-IN	OF	County				FC	per plan	Inlet at rain garden area, parking lot; Walmart owns pond	32.257065, -80.855629
73	Category 5	Walmart Pond	WMP-OUT	OF	County				FC	per plan	Outfall Structure	32.26012500, -80.85723963
74	Category 5	Walmart Pond	WMP-WET	OF	County				FC	per plan	Wetland input before road	32.258872026, -80.86701481
75	Category 5	Walmart Pond	WMP-278	OF	County				FC	per plan	Outfall from Wetland and Pond, converging near road	32.26186678, -80.85459706
76	Category 5	Barrel Landing Pond	BL#4IN	OF	County				FC	per plan	Inlet	32.29447173, -80.93433199
77	Category 5	Barrel Landing Pond	BL#4OUT	OF	County				FC	per plan	Outfall	32.294560, -80.933913
78	Category 5	Barrel Landing Pond	BL#3IN	OF	County				FC	per plan	Inlet	32.290441, -80.931489
79	Category 5	Barrel Landing Pond	BL#3OUT	OF	County				FC	per plan	Outfall	32.290229, -80.930990
80	Category 4, 5	Cypress Wetland	CW-01	OF	PR				E.coli, N, P	per plan	Done once a year; first year falls under stormwater utility. Special Project	32.382336, -80.690843
81	Category 4, 5	Cypress Wetland	CW-01A	OF	PR				E.coli, N, P	per plan	Done once a year; first year falls under stormwater utility. Special Project	32.382013, -80.689307
82	Category 4, 5	Cypress Wetland	CW-02	OF	PR				E.coli, N, P	per plan	Done once a year; first year falls under stormwater utility. Special Project	32.381014, -80.690150
83	Category 4, 5	Cypress Wetland	CW-03	OF	PR				E.coli, N, P	per plan	Done once a year; first year falls under stormwater utility. Special Project	32.378182, -80.689059
84	Category 4, 5	Cypress Wetland	CS-03A	OF	PR				E.coli, N, P	per plan	Done once a year; first year falls under stormwater utility. Special Project	32.377754, -80.689542
85	Category 5	Okatie West Pond	OKWP1	IS	County				FC	per plan	Instream, before entering pond	32.279640, -80.940851
86	Category 5	Okatie West Pond	OKWPBOX	OF	County				FC	per plan	Right of outfall box, above Bold and Gold media	32.278723, -80.9401380
87	Category 5	Okatie West Pond	OKWPBG	IS	County				FC	per plan	Bold and Gold media Clean out pipe	32.278726, -80.9401440
88	Category 5	Okatie West Pond	OKWPOUT	OF	County				FC	per plan	Outfall of pond, OKWP4 on old RFP	32.279741, -80.9405856
89	Category 5	Okatie West Pond	OKWP2	IS	County				FC	per plan	Midway between outfall and marshline, prior to a separate discharge input	32.2821, -80.9358

A	B	C	D	E	F	G	H	I	J	K	L	M
1	Monitoring type(s)	Water body or description	Point name	Type	Sample Point Owner	DHEC monitoring station	Use	POC	Parameters Analyzed*	Schedule	Notes	GPS
90	Category 5	Okatie West Pond	OKWP3	IS	County				FC	per plan	Down stream, close to edge of marsh	32.2827, -80.9338
91	Category 5	Salt Creek Pond	SCPIN	OF	Andrews				FC,Ecoli	per plan	Input to pond; Andrews collects samples, County funds USCB analysis	TBD
92	Category 5	Salt Creek Pond	SCPOUT	OF	Andrews				FC,Ecoli	per plan	Outfall of pond; Andrews collects samples, County funds USCB analysis	TBD
93	Category 5	Shanklin Pond	SHPOX1	OF	Andrews				FC,Ecoli	per plan	Shanklin oxidation pond in; Andrews collects samples, County funds USCB analysis	TBD
94	Category 5	Shanklin Pond	SHPOX2	OF	Andrews				FC,Ecoli	per plan	Shanklin oxidation pond out; Andrews collects samples, County funds USCB analysis	TBD
95	Category 5	Shanklin Pond	SHPIN	OF	Andrews				FC,Ecoli	per plan	New shanklin pond Input; Andrews collects samples, County funds USCB analysis	TBD
96	Category 5	Shanklin Pond	SHPOUT	OF	Andrews				FC,Ecoli	per plan	New shanklin pond outfall; Andrews collects samples, County funds USCB analysis	TBD
97	Category 5	Sawmill Creek Pond	SMPIN	OF	Ward Edwards				FC,Ecoli	per plan	Input pipes beneath Blufhton PKWY, Ward Edwards collects samples, County funds USCB analysis	TBD
98	Category 5	Sawmill Creek Pond	SMPOUT	OF	Ward Edwards				FC,Ecoli	per plan	Outfall pipe underneath frontage road; Ward Edwards collects samples, County funds USCB analysis	TBD
99	Category 5	Brewer Memorial Park	BMPRGIN	OF	Ward Edwards				FC,Ecoli	per plan	Rain garden input; Ward Edwards collects samples, County funds USCB analysis	TBD
100	Category 5	Brewer Memorial Park	BMPRGOUT	OF	Ward Edwards				FC,Ecoli	per plan	Rain garden outfall; Ward Edwards collects samples, County funds USCB analysis	TBD
101	Category 5	Brewer Memorial Park	BMPIDIN	OF	Ward Edwards				FC,Ecoli	per plan	Infiltration ditch input; Ward Edwards collects samples, County funds USCB analysis	TBD
102	Category 5	Brewer Memorial Park	BMPIDOUT	OF	Ward Edwards				FC,Ecoli	per plan	Infiltration ditch outfall; Ward Edwards collects samples, County funds USCB analysis	TBD
103	Category 5	Brewer Memorial Park	BMPPCIN	OF	Ward Edwards				FC,Ecoli	per plan	Pervious Concrete input; Ward Edwards collects samples, County funds USCB analysis	TBD
104	Category 5	Brewer Memorial Park	BMPPCOUT	OF	Ward Edwards				FC,Ecoli	per plan	Pervious Concrete outfall; Ward Edwards collects samples, County funds USCB analysis	TBD
105	Category 5	Brewer Memorial Park	BMPTBIN	OF	Ward Edwards				FC,Ecoli	per plan	Tree box input; Ward Edwards collects samples, County funds USCB analysis	TBD
106	Category 5	Brewer Memorial Park	BMPTBOUT	OF	Ward Edwards				FC,Ecoli	per plan	Tree box outfall; Ward Edwards collects samples, County funds USCB analysis	TBD
107	Category 5	Brewer Memorial Park	BMPHSIN	OF	Ward Edwards				FC,Ecoli	per plan	Hydrodynamic seperator input; Ward Edwards collects samples, County funds USCB analysis	TBD
108	Category 5	Brewer Memorial Park	BMPHSOUT	OF	Ward Edwards				FC,Ecoli	per plan	Hydrodynamic seperator outfall; Ward Edwards collects samples, County funds USCB analysis	TBD
109												
110	Category 1: TMDL monitoring			*Note: in situ parameters also to be collected								
111	Category 2: IDDE screening and monitoring											
112	Category 3: Water quality monitoring (baseline, based upon 303d list)											
113	Category 4: MOA points											
114	Category 5: Special project monitoring											

STATE OF SOUTH CAROLINA)
) MEMORANDUM OF AGREEMENT
COUNTY OF BEAUFORT) CITY OF BEAUFORT

THIS AGREEMENT is made and entered into this 16th day of November, 2016 by and between the City of Beaufort, South Carolina, (hereinafter referred to as the "City"), and Beaufort County, South Carolina (hereinafter referred to as the "County").

WHEREAS, the City and County recognize that it may be mutually beneficial to share in the cost of meeting certain goals for water quality in our community; and

WHEREAS, the City's Stormwater utility shall be used for administrative costs for the City of Beaufort Stormwater management program and for any applicable State or Federal mandated Stormwater requirements; and

WHEREAS, the Stormwater Management and Utility Agreement between Beaufort County, South Carolina, and the City of Beaufort, South Carolina, dated August 14, 2012, establishes that the City and County may enter into agreements to share the costs and responsibilities related to Stormwater activities, including monitoring and water sampling / testing; and

WHEREAS, the City or County may contract for the private services and materials related to Stormwater activities and request the other party to assist in the payment for the contracted services and materials at an agreed upon rate; and

WHEREAS, the County shall enter into a contract, attached as Exhibit A, with University of South Carolina Beaufort (hereinafter referred to as "USCB lab") to procure services at a cost not to exceed One Hundred Twenty Thousand dollars and zero cents (\$120,000.00) for annual Stormwater monitoring, sampling, and lab testing for watershed areas in northern Beaufort County and shared by Beaufort County, the Town of Port Royal, and the City of Beaufort for fiscal year 2017; and

WHEREAS, the County has requested that the City share in payment for USCB lab services and the City agrees to share in the cost for the services in an amount based upon the proportion of Stormwater Utility accounts that lie within the City Limits for fiscal year 2017; and

WHEREAS, this agreement shall be in effect from the date of execution for remainder of the current fiscal year and may be renewed annually for a period of up to five (5) years. The parties may negotiate the funding amounts for each successive year prior to renewal.

NOW, THEREFORE, the City agrees to compensate the County in an amount not to exceed Ten Thousand, Two Hundred, and Twelve dollars and zero cents (**\$10,212.00**) in fiscal year 2017 to pay for its proportional share of funding the consulting activities of USCB lab throughout northern Beaufort County. Funds will be received by the County via the Stormwater Management Fee per account collected by the County on behalf of the City and will not be billed separately.

IN WITNESS WHEREOF, the City of Beaufort, South Carolina and Beaufort County, South Carolina, by and through their duly authorized officers have set their hands and seals on this 16th day of November 2016.

WITNESSES:

[Signature]
[Signature]

BEAUFORT COUNTY

By: [Signature]

Its: Administrator

WITNESSES:

[Signature]
[Signature]

CITY OF BEAUFORT

By: [Signature]

Its: City Manager

June 15 2017

STATE OF SOUTH CAROLINA)
)
COUNTY OF BEAUFORT) MEMORANDUM OF AGREEMENT

THIS MEMORANDUM OF AGREEMENT ("Agreement") is being entered into by and between Beaufort County, South Carolina, a body politic duly created and existing pursuant to the provisions of S.C. Code Ann. § 4-9-10, *et seq.* (hereinafter referred to as the "County") and the Town of Bluffton, a South Carolina municipal corporation, created and existing pursuant to S.C. Code Ann. § 5-7-10, *et seq.*, located within the County (hereinafter referred to as "Town")(with the County and the Town individually a "Party" and collectively the "Parties") regarding the sharing of responsibility of Minimum Control Measures required in the National Pollution Discharge Elimination System (hereinafter referred to as "NPDES") permit requirement for South Carolina Permit #SCR030000.

WHEREAS, the County and the Town previously entered into an Intergovernmental Agreement dated July 1, 2016, to define and implement environmental initiatives related to the protection of Southern Beaufort County Watersheds and other outstanding natural resources, a copy of which is attached hereto as Exhibit "A" and fully incorporated herein by reference (herein, the "Intergovernmental Agreement"); and

WHEREAS, Article 7.02 of the Intergovernmental Agreement identifies that some aspects of NPDES Municipal Separate Storm Sewer System (MS4) Phase II requirements will lend themselves to coordination and cooperation between the Town and the County and in such instances, coordination between the Town and the County shall be on the basis of a specific Minimum Control Measure (MCM) and shall be established by a separate written agreement; and

WHEREAS, the Town and the County are both authorized to enter into this Agreement by virtue of the provisions of Sections 4-9-40 and 4-9-41 of the South Carolina Code of Laws, 1976, as amended, and Article VIII, Section 13 of the South Carolina Constitution; and,

WHEREAS, the Parties are in pursuit of their mission to protect the local watersheds and other outstanding natural resources and to implement both the County's and the Town's Monitoring Plan, Stormwater Ordinance, Stormwater Management Plans, Illicit Discharge Detection and Elimination Plan, Best Management Practice Plan and Enforcement Response Plan and the Parties have determined that this Agreement is in the best interest of achieving those objectives; and,

WHEREAS, the Parties have determined that it is reasonable, necessary, and in the public interest and welfare for the Parties to cooperate and coordinate the joint administration of the applicable stormwater management ordinances and programs within the territorial jurisdiction of the other Party, as set forth more thoroughly herein.

NOW, THEREFORE, for and in consideration of the mutual promises, undertakings and covenants set forth herein, the receipt and sufficiency of which are hereby acknowledged and affirmed by the County and the Town, the Parties hereto agree as follows:

1. **Recitals Incorporated.** The foregoing recitals are hereby incorporated as though fully set forth herein.

2. County's Right to Jointly Administer Town Stormwater Ordinance. The Town hereby agrees and grants to the County and the County hereby acknowledges and accepts the non-exclusive right and authority to jointly administer the Town's duly adopted Unified Development Ordinance 2011-15, as amended, and any plans, programs, or corresponding ordinances adopted in accordance therewith, including but not limited to the Town's (i) Stormwater Management Plan, (ii) MCM 3: Illicit Discharge Detection and Elimination (IDDE) Program, (iii) MCM 4: Construction Site Runoff Control Program, (iv) MCM 5: Post-Construction Runoff Control Program; and, (v) Monitoring Plan (herein, collectively "Town's Stormwater Ordinances"), on all properties located within the municipal limits of the Town.

a. Right of Entry. Included in the County's right to jointly administer the Town's Stormwater Ordinances within the corporate limits of the Town is the right and authority to enter onto such property located within the Town to perform water quality sampling, conduct inspections, investigate potential violations and take such other actions as permitted by the Town's Stormwater Ordinances to the fullest extent granted to the Town.

b. Notifications. The County agrees to notify the Town within twenty-four hours of detecting any potential violation of the Town's Stormwater Ordinances within the corporate limits of the Town. The notification should include the location of the potential violation, the time and date of the potential violation, the type of potential violation, and any additional information that would be necessary or prudent for the Town to have in order to carry out enforcement proceedings. The County agrees to provide the Town with any information required for enforcement action prosecution or other action permitted under the Town's Stormwater Ordinances within 14 days, and agrees to produce County personnel in court, as necessary and upon adequate notice.

c. Town Documentation. The Town agrees to provide the County with access to any documentation or records that could assist the County in its joint administration of the Town's Stormwater Ordinances.

3. Town's Right to Jointly Administer County Stormwater Ordinance. The County hereby agrees and grants to the Town and the Town hereby acknowledges and accepts the non-exclusive right and authority to jointly administer the County's duly adopted Stormwater Ordinance 2016/38, as amended, and any plans, programs, or corresponding ordinances adopted in accordance therewith, including but not limited to the County's (i) Stormwater Management Plan, (ii) MCM 3: Illicit Discharge Detection and Elimination (IDDE) Program, (iii) MCM 4: Construction Site Runoff Control Program, (iv) MCM 5: Post-Construction Runoff Control Program; and, (v) Monitoring Plan (herein, collectively "County's Stormwater Ordinances"), on all properties located within the territorial jurisdiction of the County.

a. Right of Entry. Included in the Town's right to jointly administer the County's Stormwater Ordinances within the territorial jurisdiction of the County is the right and authority to enter onto such property located within the County to perform water quality sampling, conduct inspections, investigate potential violations and take such other actions as permitted by the County's Stormwater Ordinances to the fullest extent granted to the County.

b. Notifications. The Town agrees to notify the County within twenty-four hours of detecting any potential violation of the County's Stormwater Ordinances within the territorial jurisdiction of the County. The notification should include the location of the potential violation,

the time and date of the potential violation, the type of potential violation, and any additional information that would be necessary or prudent for the County to have in order to carry out enforcement proceedings. The Town agrees to provide the County with any information required for enforcement action prosecution or other action permitted under the County's Stormwater Ordinances within 14 days, and agrees to produce Town personnel in court, as necessary and upon adequate notice.

c. County Documentation. The County agrees to provide the Town with access to any documentation or records that could assist the Town in its joint administration of the County's Stormwater Ordinances.

4. Joint Monitoring. Monitoring Components. Both Parties will meet components of their Monitoring Plans, as established pursuant to their Stormwater Ordinances and policy documents, through this Agreement as follows:

a. Monitoring locations, parameters, and flow data collection locations will be determined by both Parties and samples will be collected in accordance with both Parties' Monitoring Plans. Every effort will be made to establish locations and parameters that align with both Parties' Monitoring Plans.

b. All analytical results, in-situ data, and flow monitoring data will be reported within thirty (30) days of sample receipt. A preliminary report of completed results prior to thirty (30) days can be issued to the County or Town. Analytical results for microbiological parameters are typically available forty-eight (48) hours after sample receipt and will be given to both parties thereafter. All water quality data will be conveyed to both Parties via email, unless otherwise requested in writing by the requesting Party.

c. Neither Party will incur any fees to the other in regards to this joint monitoring plan.

d. The Town will sample MRR02 in the May River Watershed (Cahill's outfall site located off of Highway 46) at the location and parameters outlined in the County's Monitoring and Assessment Plan for TMDL and Impaired Waters. This site will be sampled each quarter for one wet and one dry weather event to meet both the Town's and County's MS4 Monitoring and Assessment Program (as stated in subsection 4(a) above).

e. The County will sample the OKW3 in the Colleton River watershed at the locations and parameters outlined in the County's Monitoring and Assessment Plan for TMDL and Impaired Waters. These sites will be sampled each quarter for one wet weather and one dry weather event. This schedule and selection of parameters meet both the Town's and County's MS4 Monitoring and Assessment Programs (as stated in subsection 4(a) above).

f. The County will sample the NRW01 in the New River watershed at the locations outlined in the County's Monitoring and Assessment Plan for TMDL and Impaired Waters. The County will monitor for Enterococcus and Mercury, the current

impairments identified by SCDHEC on the New River. This site will be sampled each quarter for one wet weather and one dry weather event. This schedule and selection of parameters meet both the Town's and County's MS4 Monitoring and Assessment Programs (as stated in subsection 4(a) above).

g. All water quality data collected by either Party related to or for the New, May and Colleton Rivers watersheds will be shared.

5. Miscellaneous.

a. Waiver. In the event that any agreement contained herein should be breached by either party and thereafter waived by either party, such waiver shall be limited to the particular breach so waived and shall not be deemed to waive any other breach hereunder.

b. Amendments. Except as otherwise provided herein, this Agreement may not be amended, changed, modified or altered without the prior written consent of both Parties hereto.

c. Severability. In the event that any provision of this Agreement shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provisions hereof.

d. Counterparts. This Agreement may be simultaneously executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

e. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of South Carolina.

f. Captions. The captions or headings herein are for convenience only and in no way define, limit or describe the scope or intent of any provision or sections of this Agreement.

g. No Partnership. The Parties hereto intend only to provide for the provision of the services described herein and affirmatively state that no master-servant, principal-agent, employer-employee relationship is created by this Agreement. No employee, volunteer, contractor, agent, or subagent, shall be considered an employee or agent of the other party for any purpose whatsoever, and none shall have any status, right or benefit of employment with the other.

h. No Third Party Beneficiaries. The Parties hereto affirmatively represent that this Agreement is made solely for the benefit of the County and the Town and is not for the benefit of any third party who is not a signature party hereto. No party other than the signature parties hereto shall have any enforceable rights hereunder, or have any right to the enforcement hereof, or any claim for damages as a result of any alleged breach hereof.

6. Term. The term of this Agreement shall be from the latest date of execution for three (3) years. The Agreement will be reviewed by the County and Town annually to determine funding availability for the upcoming year. This Agreement can be extended for additional cycles upon the mutual agreement of the Parties.

June 15 2017

7. **Termination for Convenience.** The County and the Town shall have the right to terminate this Agreement for convenience upon 60 days written notice.

8. **Notice.** All notices required to be given under the terms of this Agreement shall be in writing and either (i) served personally during regular business hours; (ii) served by e-mail; or, (iii) served by certified or registered mail, return receipt requested, properly addressed with postage prepaid. Notices upon the Parties shall be served as follows:

TO THE TOWN: Town of Bluffton Engineering Department
 Attn: Watershed Management Division Director
 Post Office Box 386
 Bluffton, South Carolina 29910
 E-Mail: kjones@townofbluffton.com

TO THE COUNTY: Beaufort County, South Carolina
 Attn: Stormwater Manager
 Post Office Drawer 1228
 Beaufort, South Carolina 29902
 E-Mail: elarson@bcgov.net

[Remainder of Page Intentionally Omitted. Signature Page(s) and Exhibit(s) to Follow.]

June 15 2017

IN WITNESS WHEREOF, the Parties hereto have affixed their signature hereto the date first written hereinabove.

BEAUFORT COUNTY, SOUTH CAROLINA TOWN OF BLUFFTON

By: Gary Kubic
Name: Gary Kubic
Its: County Administrator
Date: 06/05/2017

By: Marc Orlando
Name: Marc Orlando
Its: Town Manager
Date: 6/15/2017

STATE OF SOUTH CAROLINA)

COUNTY OF BEAUFORT)

MEMORANDUM OF AGREEMENT
TOWN OF PORT ROYAL

THIS AGREEMENT is made and entered into this 10th day of July, 2015 by and between the Town of Port Royal, South Carolina, (hereinafter referred to as the "Town"), and Beaufort County, South Carolina (hereinafter referred to as the "County").

WHEREAS, the Town and County recognize that it may be mutually beneficial to share in the cost of meeting certain goals for water quality in our community; and

WHEREAS, the Stormwater Management and Utility Agreement between Beaufort County, South Carolina, and the Town of Port Royal, South Carolina, dated June 26, 2012, establishes that the Town and County may enter into agreements to share the costs and responsibilities related to stormwater activities, including monitoring and water sampling / testing; and

WHEREAS, the Town or County may contract for the private services and materials related to stormwater activities and request the other party to assist in the payment for the contracted services and materials at an agreed upon rate; and

WHEREAS, the County shall enter into a contract, attached as Exhibit A, with University of South Carolina Beaufort (hereinafter referred to as "USCB lab") to procure services at a cost not to exceed Ninety-Three Thousand dollars (\$93,000.00) for annual stormwater monitoring, sampling, and lab testing for watershed areas in northern Beaufort County and shared by Beaufort County, the Town of Port Royal, and the City of Beaufort for fiscal year 2016; and

WHEREAS, the County has requested that the City share in payment for USCB lab services and the Town agrees to share in the cost for the services in an amount based upon the proportion of County Single Family Units (SFUs) that lie within the Town Limits (8.16%) for fiscal year 2016; and

WHEREAS, this agreement shall be in effect from the date of execution for remainder of the current fiscal year and may be renewed annually for a period of up to five (5) years. The parties may negotiate the funding amounts for each successive year prior to renewal.

NOW, THEREFORE, the Town agrees to compensate the County in an amount not to exceed Seven Thousand, Five Hundred, Ninety dollars and zero cents (\$7,590.00) in fiscal year 2016 to pay for its proportional share of funding the consulting activities of USCB lab throughout northern Beaufort County.

IN WITNESS WHEREOF, ~~the City of Beaufort~~, Town of Port Royal, South Carolina and Beaufort County, South Carolina, by and through their duly authorized officers have set their hands and seals on this 10th day of July 2015.

WITNESSES:

Larry Harris

BEAUFORT COUNTY

By: [Signature]

Its: Administrator

WITNESSES:

Tanya L. Payne
Cynthia K. Small

TOWN OF PORT ROYAL

By: [Signature]

Its: Town Manager