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May 04 2026

SC Court of Appeals

STATE OF SOUTH CAROLINA
IN THE COURT OF APPEALS

APPEAL FROM THE CIRCUIT COURT
FRANK R. ADDY, Presiding Judge

Appellate Case No.: 2025-001315
Civil Action No. 2022-CP-10-05192

South Carolina Coastal Conservation League and
Charleston Waterkeeper

v.

Appellants,

South Carolina Department of Health and
Environmental Control

Respondent.

RECORD ON APPEAL
VOLUME II

Leslie S. Lenhardt, Esq. (S.C. Bar No. 15858)
Amy E. Armstrong, Esq. (S.C. Bar No.
70352)
Monica Whalen, Esq. (S.C. Bar No. 106638)
S.C. Environmental Law Project
510 Live Oak Drive
Mount Pleasant, SC 29464
Telephone: (843) 527-0078

*Attorneys for Appellants South Carolina
Coastal Conservation League and Charleston
Waterkeeper*

Joseph A. Giordano, Esq. (S.C. Bar No.
104500)
Bradley D. Churdar, Esq. (S.C. Bar No.
12829)
South Carolina Department of Environmental
Services
2600 Bull Street
Columbia, SC 29201
Telephone: (803) 898-1309

*Attorneys for Respondent South Carolina
Department of Health and Environmental
Control*

RECORD ON APPEAL

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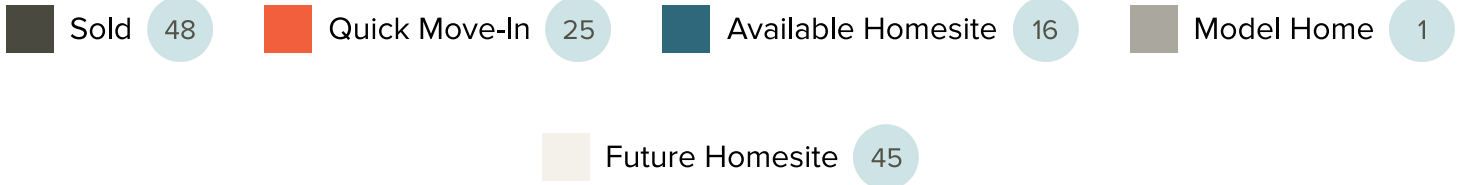
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EXHIBIT K



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EXHIBIT L



Map for presentation purposes only. Not drawn to scale.



- Available
- Model
- Quick Move-in
- Deposit
- Sold

EXHIBIT M

Town of Awendaw
Planning Commission Staff Report
Monday, March 20, 2023
6:00 PM
Town of Awendaw
691 Doar Road, Awendaw, SC

Agenda Item D.2
Public Hearing
Zone Change from Agricultural General to
Planned Development (PD)

The Proposal for consideration is an amendment to the Zoning Map. The proposal is to change the zoning on TMS Number 680-00-00-031 from Agricultural General to Planned Development called ***Seewee Landing***.

The property is located on the northwest side of Seewee Road at the intersection of Seewee Road and Granny's Lane. The Seewee Landing Subdivision will be constructed on a rectangular (long and narrow) tract of land containing a total of 48.97 acres of which 7.92 acres are jurisdictional and non-jurisdictional wetlands.

71% of the subdivision will be a developable area, while the remaining 29% will be in an open space designation and will not be developed.

The proposal is to construct 72 single-family homes at a maximum density of 1.47 dwelling units per acre.

The Seewee Landing Planned Development will be developed in accordance with the PD as outlined in the attached document. The PD Regulations set forth the general scope of the development including the number of units (72), development standards, open spaces, and other issues. All matters not addressed

in the PD shall be governed by the current Town of Awendaw Ordinances in effect and any conditions placed by the Planning Commission. Any major variations from the approved PD Regulations may require a Planned Development Amendment. All minor variations shall be handled by the Town of Awendaw Zoning Administrator.

The goal of the development is to produce a high quality friendly residential development while also protecting the natural beauty that abounds on the property. The development of the property will pose minimal impacts on freshwater wetlands. The open space and amenities will be owned and maintained by the developer, homeowner's association, or other legally designated entity.

Because the dimensions of the unusually deep and narrow property require the use of one road with ingress/egress on Seewee Road only, the road will not be a traditional cul-de-sac and will instead include two (2) oval loops to allow vehicles to safely change directions and traverse the neighborhood. The Town's existing street standard for rural road cul-de-sacs is a maximum length of 1,500 linear feet. This PD modifies the Zoning Code to allow a longer length. The proposal in the PD would creatively permit a non-traditional cul-de-sac that would employ the use of two oval loops along the roadway. The first oval would be located at the first +1,500 foot point and the second would be located approximately 1,500 feet further away. These two oval loops alleviate much of the concern that would arise with a traditional 3,000-foot cul-de-sac. Staff supports this modification.

If approved, the proposed Seewee Landing development would alter the requirements of the Zoning Code in the following manner(s):

- The proposed minimum lot size is 10,000 square feet versus the Zoning Code requirement of 12,500 square feet.
- The proposed minimum lot width is 60 feet versus the Zoning Code requirement of 100 feet.
- The proposed minimum front setbacks are reduced from the 35 feet required by the Zoning Code.
- The proposed site coverage is 45% versus the Zoning Code requirement of 35%.

- The proposed 700 square-foot maximum square footage for an accessory dwelling unit is not addressed in the Zoning Code.
- The proposed exclusion of mobile homes is not addressed in the Zoning Code.
- The proposed 3,000 foot cul-de-sac length versus the 1,500-foot Zoning Code length.

Staff Recommendation: Approve the Zone Change from Agricultural General to Planned Development for Seewee Landing with the following conditions/modifications.

1. Before the approval of the Final Plat, the Owner/Applicant shall receive approvals from all Federal, State, and local agencies that the development is acceptable to each agency responsible for approving land development activities in South Carolina.
2. Before the recordation of the Final Plat and subject to Planning Director approval, the Owner/Applicant shall have satisfied all requirements consistent with approvals from all Government agencies with Authority and with the Subdivision Ordinance of the Zoning Code.
3. The Owner/Applicant shall be required to obtain review and approval by SCDOT concerning any possible transportation impacts and encroachment permits and provide to the Town approved plans for any potential off-site improvements that might be required by SCDOT. The applicant is responsible for contacting the SCDOT for all driveway encroachment permits.
4. The developer shall contact OCRM regarding the applicability of both its stormwater and Coastal Zone Area Consistency review in that this property is within one-half mile of coastal waters and the state's NPDES stormwater program requires that anyone engaged in clearing, grading, and/or excavating activities to obtain coverage under the state's Construction General Permit (CGP) from DHEC's Stormwater Permitting division before beginning any land-disturbing activities. While smaller projects or developments located in the Coastal Zone within one-half mile of coastal receiving water **may** be automatically granted coverage under a general NPDES permit, the applicant is required to provide the Town with evidence that a technical stormwater review has been processed before approval of any Final plats. A general coastal zone consistency determination, which is issued by DHEC's Office of Ocean and Coastal Resource Management, is also required.
5. The Applicant shall record Covenants, Conditions, and Restrictions (CC&Rs) which establish a Property Owners Association (POA). This POA provides for the permanent maintenance responsibilities of; a) Any ponds and/or stormwater system and appurtenant landscaping,

fencing, and access; b) Common area landscaping; c) Plantings required for oak/hardwood tree removal mitigation.

6. Title to the common [OPEN SPACE, WETLANDS) areas shall be held by a non-profit association or the Homeowners Association. Wetlands may not be conveyed to a private homeowner. The holding entity will maintain the wetlands in their natural state and not allow any type of structure that might otherwise degrade the quality of the wetland.
7. To reduce stormwater runoff, allow for infiltration, reduce pollutants, and minimize degradation of stormwater quality from the development, parking lots, buildings, structures, streets, and other paved surfaces, the Owner/Applicant shall agree to limit the maximum impervious area on any lot to 35%. The Planned Development proposal is for 45% which staff believes is too high for this location within a half mile of Cape Romain.
8. To reduce the impact on Seewee Road, all construction-related vehicles, equipment staging, and storage areas shall be located onsite and away from the Seewee Road right of way. The Owner/Applicant shall provide all construction personnel & the Town with written notice of this requirement and a description of approved parking, staging, and storage areas.
9. Without a public wastewater system in the Town, all proposed lots will be served with onsite septic systems. The applicant shall provide copies of SCDHEC approvals for individual sewage disposal systems before approval of a Final Plat by the Director. DHEC approval WITH the septic site locations will be attached to any zoning permit packages for construction on any of the individual lots.
10. To decrease the chances of failure of the proposed septic systems, the Applicant shall agree to require within the recorded CC&Rs that the homeowners association (HOA) shall be required to retain and have a third-party inspection of each of the 72 individual septic systems every three years.
11. Prescribed burning is vital to the health and protection of federally protected lands and forests. As to not interfere with this important activity, the Applicant has agreed to include in the recorded CC&Rs prescribed fire smoke easements with the US Forest Service and US Fish & Wildlife Service.
12. To reduce light pollution, the Applicant has agreed to coordinate with Berkeley Electric Co-op on the location and number of overall fixtures to lessen the impact on the surrounding natural areas. These fixtures shall be by "full cutoff" type and shall not impact Birds of Prey and Cape Romain Wildlife Refuge.
13. To decrease the impact on the local solid waste system, the Applicant has agreed that the POA will establish regular solid waste pick-up for all residents.

14. The Applicant shall agree to limit the hours of construction to Charleston County standards.
15. The applicant shall agree to implement a 50-foot exterior boundary “no-build” setback buffer on all four sides of the PD property and shall be shown/depicted on the Final Plat before the Town can approve it.
16. Vinyl siding may not be used on any elevation of the primary structure or garage.
17. Each owner may legally build up to 40% of the square footage of the lot size. If the lot is 10,000 square feet, the primary home plus any accessory dwelling unit can be a total of 4,000 square feet.
18. Each lot will have public water provided by the Town of Awendaw Water and approved by SCDHEC.

Town of Awendaw Subdivision Application

3/07

Town of Awendaw Planning Department
6971 Doar Road
Awendaw, SC 29429
Phone (843) 928-3100 Fax 928-3713

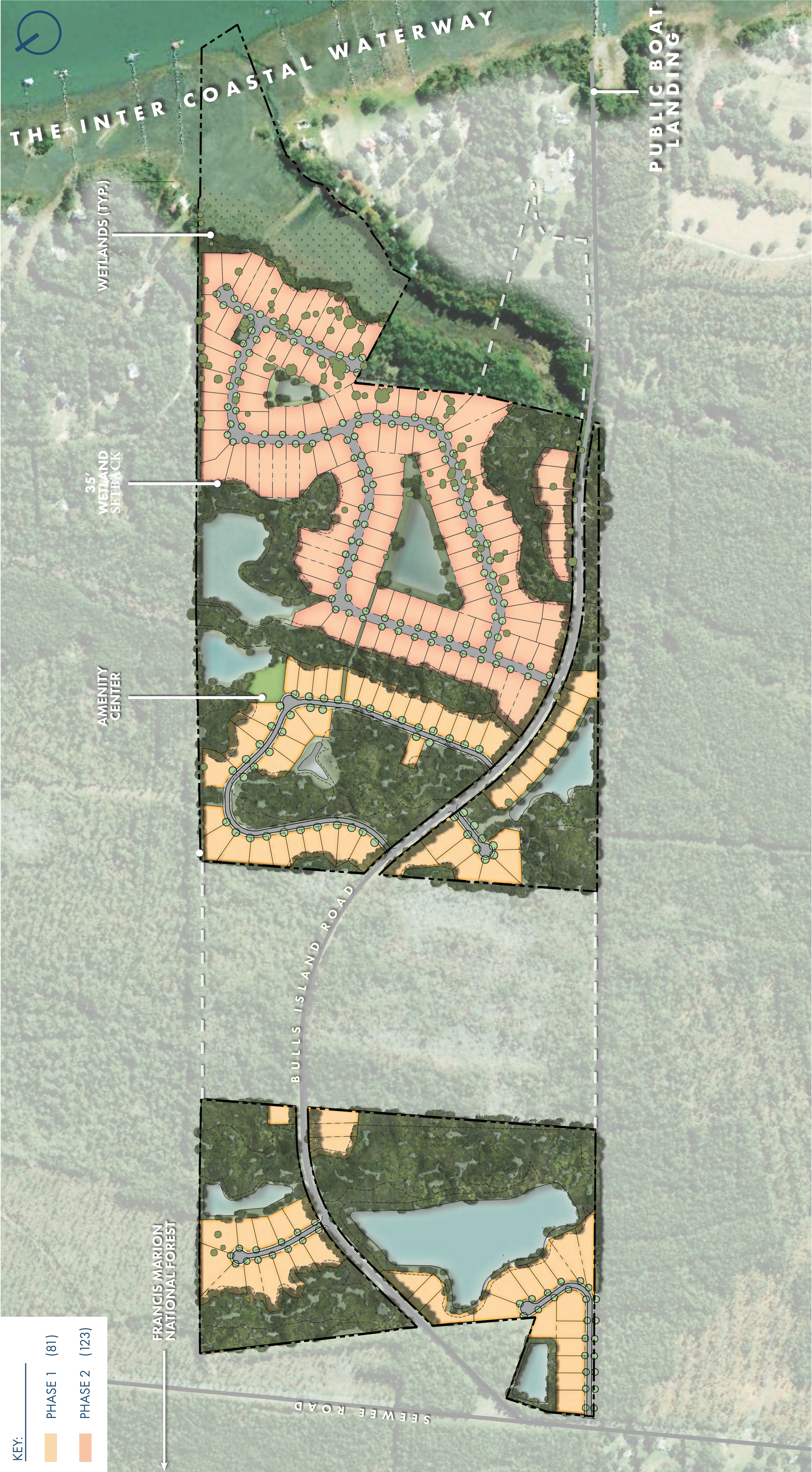
APPLICANT:	Lowcountry Land Development Cons	OWNER:	American Star, LLC
ADDRESS:	3030 Ashley Town Center Dr, Ste 101A	ADDRESS:	103 Palm Blvd, Ste 3B
	Charleston, SC 29414		Isle of Palms, SC 29451
TELEPHONE:	843-296-6364	PROPERTY LOCATION:	Seewee Road across from Granny's Lane
SURVEYOR:	Michael Shulse	ACREAGE:	48.97 TMS# 680-00-00-031
ADDRESS:	1210 River Reach Dr	INITIAL # OF LOT:	1
	Wando, SC 29492	PROPOSED # OF LOTS:	72 (**if less than 5 lots, site plan(s) required)
TELEPHONE:	843-296-1607	SITE PLAN(S) REQUIRED** Y / N	ZONING: AG
		MUST SUBMIT 9 PRELIMINARY PLATS WITH APPLICATION	

APPLICANT IS TO COMPLETE EVERYTHING ABOVE THIS LINE ONLY

Date received: _____	Fee Paid: _____	Received by: _____
Pre-application date: _____	Mylar, 7 copies: Y / N	Site plan(s): Y / N
	INITIAL REVIEW	1st REVISION
	2nd REVISION	3rd REVISION
	4th REVISION	
Plat submitted	_____	_____
Property inspected	_____	_____
Comments mailed	_____	_____
Comments mailed	_____	_____
Comments mailed	_____	_____
Comments mailed	_____	_____
Preliminary Plat		Drainage Easement/Road Dedication
PC agenda date	_____	PW Committee agenda date
Notification to paper	_____	Recommendation
Mailed	_____	Town Council agenda date
Recommendation	APP / DIS	Recommendation
DATE PC decision mailed	_____	Agenda/Council letters filed
Conditionals		Letters
Cost Estimates	YES / NO	Affidavit
Letters of Credit	YES / NO	Certificate of Ownership
		Letter from DHEC
		Letter for public water
Final Plat		
Date approved	_____	Special Notes
Mylar and prints recorded	BK _____ PG _____	
Plats distributed to agencies	_____	
Approved letter to applicant	_____	

APPLICATION NUMBER (given when stamped) _____

EXHIBIT N



KEY:

PHASE 1 (81)

PHASE 2 (123)

FRANCIS MARION
NATIONAL FOREST

AMENITY
CENTER

35'
WETLAND
SETBACK

WETLANDS (TYP.)

BULLS ISLAND ROAD

SEEWEE ROAD

PUBLIC BOAT
LANDING

WHITE TRACT

AWENDAW, SC

EXHIBIT O

REFERENCES

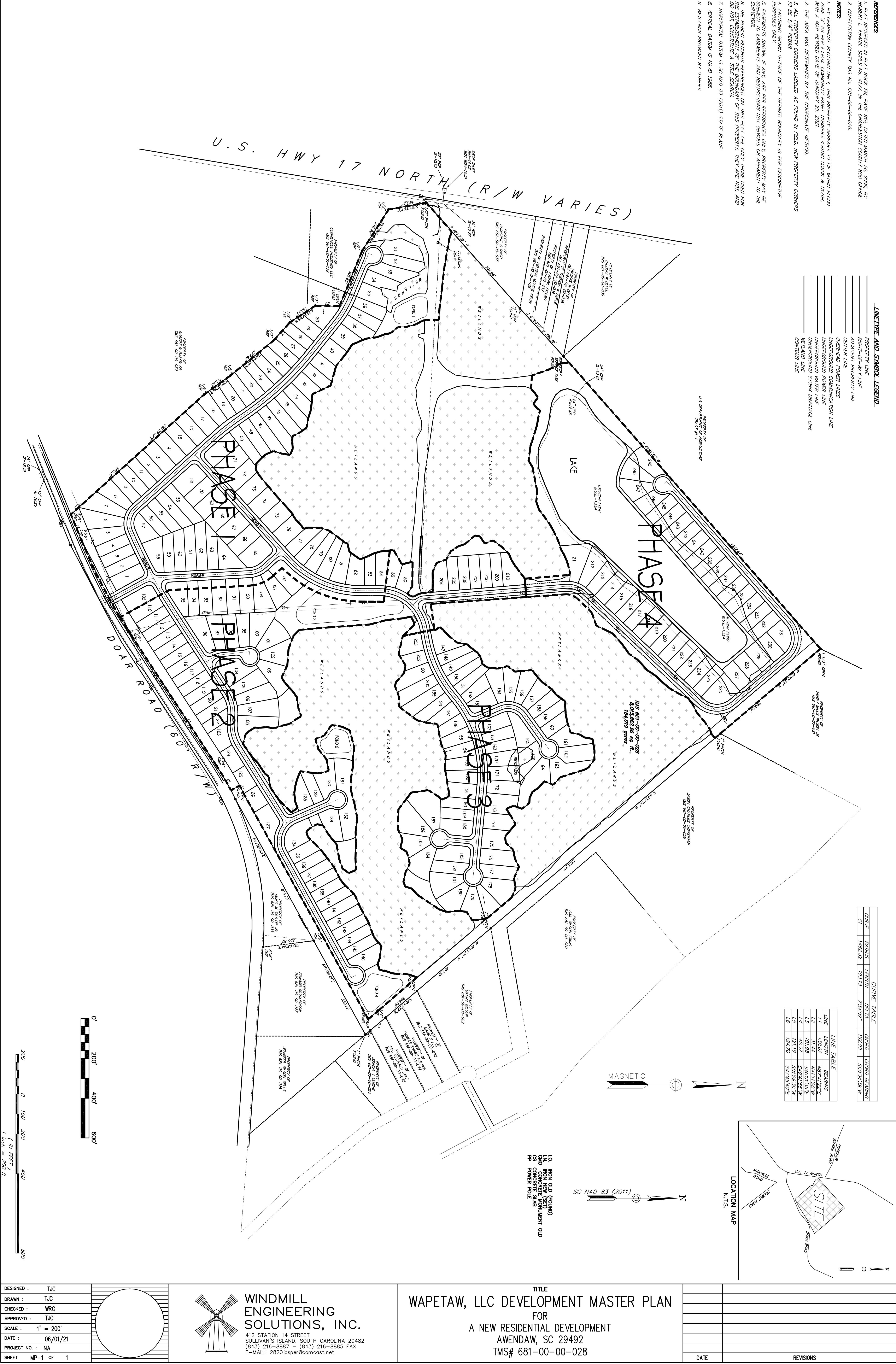
1. PLAT RECORDED IN PLAT BOOK EH, PAGE B18, DATED MARCH 20, 2008, BY ROBERT E. FRANK, SURVEY NO. 4171, IN THE CHARLESTON COUNTY ROAD OFFICE.
2. CHARLESTON COUNTY TMS NO. 681-00-00-028.

NOTES

1. BY GRAPHICAL PLOTTING ONLY, THIS PROPERTY APPEARS TO LIE WITHIN FLOOD ZONE 1A, AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) NO. 15050C, DATED 03/06/04, AND 07/04/04, WITH A MAP REVISED DATE OF JANUARY 28, 2021.
2. THE AREA WAS DETERMINED BY THE COORDINATE METHOD.
3. ALL PROPERTY CORNERS LABELED AS FOUND IN FIELD, NEW PROPERTY CORNERS TO BE 3/4" REBAR.
4. ANYTHING SHOWN OUTSIDE OF THE DEFINED BOUNDARY IS FOR DESCRIPTIVE PURPOSES ONLY.
5. EASEMENTS SHOWN, IF ANY, ARE PER REFERENCES ONLY. PROPERTY MAY BE SUBJECT TO EASEMENTS AND RESTRICTIONS NOT DEPICTED OR APPARENT TO THE SURVEYOR.
6. THE PUBLIC RECORDS REFERENCED ON THIS PLAT ARE ONLY THOSE USED FOR THE ESTABLISHMENT OF THE BOUNDARY OF THIS PROPERTY. THEY ARE NOT, AND DO NOT, CONSTITUTE A TITLE SEARCH.
7. HORIZONTAL DATUM IS SC NAD 83 (2011) STATE PLANE.
8. VERTICAL DATUM IS MVD 1988.
9. WETLANDS PROVIDED BY OTHERS.

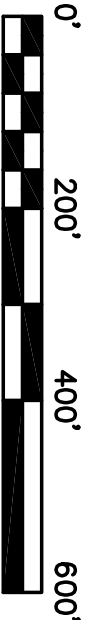
LINE TYPE AND SYMBOL LEGEND

PROPERTY LINE
ADJACENT PROPERTY LINE
CONCRETE LINE
OPENFIELD POWER LINES
UNDERGROUND COMMUNICATION LINE
UNDERGROUND POWER LINE
UNDERGROUND WATER LINE
UNDERGROUND STORM DRAINAGE LINE
WETLAND LINE
CONTOUR LINE



CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEARING
C1	1482.52	153.13	7.34 62°	126.59	S80°29'35"W

LINE	LENGTH	BEARING
L1	138.62	N67°41'22"E
L2	31.44	N41°11'20"W
L3	101.89	S40°01'35"E
L4	151.10	S48°41'55"W
L5	124.20	S47°45'40"E



DESIGNED : TJC		WINDMILL ENGINEERING SOLUTIONS, INC. 412 STATION 14 STREET SULLIVAN'S ISLAND, SOUTH CAROLINA 29482 (843) 216-8887 - (843) 216-8885 FAX E-MAIL: 2820jasper@comcast.net	TITLE			
DRAWN : TJC			WAPETAW, LLC DEVELOPMENT MASTER PLAN			
CHECKED : WRC			FOR			
APPROVED : TJC			A NEW RESIDENTIAL DEVELOPMENT			
SCALE : 1" = 200'			AWENDAW, SC 29492			
DATE : 06/01/21	TMS# 681-00-00-028		DATE		REVISIONS	
PROJECT NO. : NA						
SHEET MP-1 OF 1						

EXHIBIT P

Delay in Processing Permits for Septic Tanks

Updated August 26, 2022

DHEC has had a significant increase in the number of permit applications for septic tanks, also called onsite wastewater systems. This has led to the agency currently having, as of the end of June 2022, about 3,000 pending permit applications. At this time, it's taking up to 18 weeks to process septic tank applications from the time the application is deemed complete, and the site is prepared by the applicant for evaluation. Applications are processed on a first come, first serve basis.

We recognize that this has significant implications for those building or siting a home on a piece of property, and we regret the impact these delays are having. DHEC is working to reduce these delays as quickly as possible.

Background Information

DHEC is responsible for issuing a **septic tank permit** </environment/your-home/septic-tanks> before a septic tank can be installed. This helps ensure that a septic tank, also known as an onsite wastewater system, can successfully operate at a proposed site for the proper treatment and disposal of domestic wastewater. Improperly handled wastewater could make people sick or harm the surrounding environment. **Once permitted and properly installed, the proper maintenance of a septic tank** </environment/your-home/septic-tanks/septic-tank-maintenance-tips> **is the responsibility of the property owner.**

There are two main factors contributing to this current workload:

Rapid residential growth and land development around the state has significantly increased the number of septic tank applications submitted to DHEC. In 2010, DHEC received 7,456 applications. This number more than doubled in 2021 when DHEC received 17,256 applications. Since Jan. 1, 2022, DHEC has received more than 9,700 applications. Based on this, DHEC expects to receive more than 19,000 applications in 2022.

Current staffing levels are unable to keep up with the increased demands. The program has been impacted by a high turnover rate and limited workforce availability. The program's current vacancy rate is 35 percent.

EXHIBIT Q

RE: FOI request, septic tank applications, Charleston County

From: Martinez, Sara <martinsv@dhec.sc.gov>
To: leslie@scelp.org <leslie@scelp.org>, Information, Freedom <foi@dhec.sc.gov>
Cc: [Emily Nellermoe](mailto:emily@scelp.org) <emily@scelp.org>, [Brand, Kelsey L.](mailto:brandkl@dhec.sc.gov) <brandkl@dhec.sc.gov>
Subject: RE: FOI request, septic tank applications, Charleston County
Date: Monday, September 12, 2022 5:38 PM
Size: 51 KB

Hi Leslie. The FOIA department will pull any septic tank applications/permits (BEHS) and stormwater applications/permits (BOW). Do you want to also have them check with OCRM for any CZCs or Critical Area Permits? Are there any other types of permits you are interested in so we can make sure we are checking for them? With all the different types of permits falling in many different programs within the agency, it is onerous and likely unreliable for us to confirm for you we have identified "any" permits for a site rather than searching for any specifically listed types of permits. We certainly want to check all the program areas for any type of permit you may be interested in us searching.

We also need to know the specific permit applications you want notice of in order to track your request for written notice of a permitting decision. For notices related to any future applications or permits, please resubmit your request at such time as the applications or permit exist so that the Department will be able to track your request with the specific application or permit. You can monitor for permit applications that are placed on public notice via the Department's website here: <https://scdhec.gov/permits-regulations/public-notices>. For all other permit applications, you may continue to inquire with the Department's FOIA office.

Let me know if you have any questions. And don't hesitate to follow-up with me on the status of your FOIA request to ensure it gets processed expediently. Would it be helpful I were able to let you know, even while the full FOIA response is still being pulled together, once the program staff have responded whether any pending permit applications exist?

Sara V. Martinez

Chief Counsel for Environmental Affairs

S.C. Dept. of Health & Environmental Control

2600 Bull Street

Columbia, SC 29201

office: (803) 898-0288

cell: (803) 465-2822

connect: www.scdhec.gov



From: Leslie Lenhardt <leslie@scelp.org>

Sent: Monday, September 12, 2022 4:16 PM

To: Information, Freedom <foi@dhec.sc.gov>

Cc: Martinez, Sara <martinsv@dhec.sc.gov>; Emily Nellermoe <emily@scelp.org>; Brand, Kelsey L. <brandkl@dhec.sc.gov>

Subject: Re: FOI request, septic tank applications, Charleston County

*** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. ***

Many thanks!

--

Leslie Lenhardt

Staff Attorney

S.C. Environmental Law Project

510 Live Oak Drive

Mount Pleasant, SC 29464

Phone: (843) 527-0078

leslie@scelp.org

On Mon, Sep 12, 2022, at 4:14 PM, Information, Freedom wrote:

Good afternoon,

I hope you are well! We have received your request through our FOI email, and it has been assigned FOI request number **868106**. It is currently pending assignment to a coordinator for further processing.

Kindest Regards,

Freedom of Information

S.C. Dept. of Health & Environmental Control

Office: (803)898-3882

Connect: www.scdhec.gov [Facebook](#) [Twitter](#)



From: Leslie Lenhardt <leslie@scelp.org>

Sent: Monday, September 12, 2022 12:54 PM

To: Information, Freedom <foi@dhec.sc.gov>

Cc: Martinez, Sara <martinsv@dhec.sc.gov>; Emily Nellerhoe <emily@scelp.org>; Brand, Kelsey L. <brandkl@dhec.sc.gov>

Subject: FOI request, septic tank applications, Charleston County

*** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. ***

Good afternoon,

I am submitting this request pursuant to the SC Freedom of Information Act for parcels located in the Town of Awendaw in Charleston County. We are seeking any and all DHEC applications and/or permits, including but not limited to septic tank applications/permits and stormwater applications/permits. I am attaching documents that identify the properties with the TMS numbers: 6810000028 (Please note that I requested notification for any permits for this tract pursuant to S.C. Code Ann. Section 44-1-60, letter attached)

6440000023

6440000026

6440000030

I am also requesting notification pursuant to S.C. Code Ann. Section 44-1-60 for the remaining three properties for any permitting decisions forthcoming.

Please let me know if you require any other information from me. Thank you!

Leslie

--

Leslie Lenhardt

Staff Attorney

S.C. Environmental Law Project

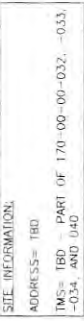
510 Live Oak Drive

Mount Pleasant, SC 29464

Phone: (843) 527-0078

leslie@scelp.org

EXHIBIT R



DRAIN FIELD CALCS

-034, AND 040

DESIGN SUMMARY - PHASE 1 - LV1.32

[TAB= 0.40 (REF. 501.5 REPORT BY TYLER SCRO DATED SEPTEMBER 29, 2022)]

ZONE OF SATURATION= 18"

DRIP TUBE INSTALLATION DEPTH= 12" BELOW EXISTING GRADE (AFTER REMOVING +/- 12" OF ORGANIC HORIZONS)

BEDROOMS= 4 BEDROOMS

DESIGN FLOWRATE= 480 GPD (120 GAL/DAY/BEDROOM REF. R.61-56 APP. R)

TOTAL MIN. REQUIRED SYSTEM AREA= 1200 SF DESIGN, 50% REPAIR AREA= 600 SF

DESIGN SYSTEM AREA= 1400 SF, REPAIR AREA 600 SF

EQUIPMENT SELECTION

DRIP TUBE= 600 LF MIN. OF BEDROOM WASTEFLOW FC 1/4"PH, INSTALLED PER MANUFACTURER SPECIFICATIONS.
TUBE SPACING: 24" O.C.
EMITTERS SPACING: 12" O.C.

SEPTIC TANK SELECTION= BOTH INJECTION MOLDED 1,000 GALLON TANK, INSTALLED PER MANUFACTURER SPECIFICATIONS AND DETAILS SHEET G-03.

TREATMENT TANK SYSTEM= ORENCO AX20 RTB 800 GAL PRE-TREATMENT TANK W/ PUMP DISCHARGE, INSTALLED PER MANUFACTURER SPECIFICATIONS AND DETAILS SHEET G-03.

RECIRC PUMP SELECTION= ORENCO SYSTEMS PF3000S, 30 GPM PUMP INSTALLED PER MANUFACTURER SPECIFICATIONS AND DETAILS SHEET G-03.

DOSING PUMP SELECTION= ORENCO SYSTEMS PF2000S, 20 GPM PUMP INSTALLED PER MANUFACTURER SPECIFICATIONS AND DETAILS SHEET G-03.

NOTE: CONTRACTOR PROPOSED ALTERNATIVE TANKS, SYSTEMS AND DRIP TUBING SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

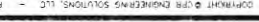


EXHIBIT S



U.S. Department of Health and Human Services

U.S. Department of Housing and Urban Development

Healthy Housing Reference Manual



Suggested citation: Centers for Disease Control and Prevention and U.S. Department of Housing and Urban Development. Healthy housing reference manual. Atlanta: US Department of Health and Human Services; 2006.

Use of trade names is for identification only and does not imply endorsement by the Centers for Disease Control and Prevention, the Public Health Service, the U.S. Department of Health and Human Services, or the U.S. Department of Housing and Urban Development.

Cover: Large photo by Teresa M. Sims; small photo by Don W. Johnson.

**Additional copies of this manual can be downloaded from
www.cdc.gov/healthyhomes/publications.html**

Chapter 10: On-site Wastewater Treatment

“Technology has made large populations possible; large populations now make technology indispensable.”

Joseph Wood Krutch, Author, 1932

Introduction

The French are considered the first to use an underground septic tank system in the 1870s. By the mid 1880s, two-chamber, automatic siphoning septic tank systems, similar to those used today, were being installed in the United States. Even now, more than a century later, septic tank systems represent a major household wastewater treatment option. Fully one-fourth to one-third of the homes in the United States use such a system [1].

On-site sewage disposal systems are used in rural areas where houses are spaced so far apart that a sewer system would be too expensive to install, or in areas around cities where the city government has not yet provided sewers to which the homes can connect. In these areas, people install their own private sewage treatment plants. As populations continue to expand beyond the reach of municipal sewer systems, more families are relying on individual on-site wastewater treatment systems and private water supplies. The close proximity of on-site water and wastewater systems in subdivisions and other developed areas, reliance on marginal or poor soils for on-site wastewater disposal, and a general lack of understanding by homeowners about proper septic tank system maintenance pose a significant threat to public health. The expertise on inspecting, maintaining, and installing these systems generally rests with the environmental health staff of the local county or city health departments.

These private disposal systems are typically called septic tank systems. A septic tank is a sewage holding device made of concrete, steel, fiberglass, polyethylene, or other

approved material cistern, buried in a yard, which may hold 1,000 gallons or more of wastewater. Wastewater flows from the home into the tank at one end and leaves the tank at the other (Figure 10.1) [2].

Proper maintenance of septic tanks is a public health necessity. Enteric diseases such as cryptosporidiosis, giardiasis, salmonellosis, hepatitis A, and shigellosis may be transmitted through human excrement. Historically, major epidemics of cholera and typhoid fever were primarily caused by improper disposal of wastewater. The earliest epidemiology lesson learned was through the effort of Dr. John Snow of England (1813–1858) during a devastating cholera epidemic in London [3]. Dr. Snow, known as the father of field epidemiology, discovered that the city's water supply was being contaminated by improper disposal of human waste. He published a brief pamphlet, *On the Mode of Communication of Cholera*, suggesting that cholera is a contagious disease caused by a poison that reproduces in the human body and is found in the vomitus and stools of cholera patients. He believed that the main, although not only, means of transmission was water contaminated with this poison. This differed from the commonly accepted belief at the time that diseases were transmitted by inhaling vapors.

Treatment of Human Waste

Safe, sanitary, nuisance-free disposal of wastewater is a public health priority in all population groups, small and large, rural or urban. Wastewater should be disposed of in a manner that ensures that

- community or private drinking water supplies are not threatened;
- direct human exposure is not possible;
- waste is inaccessible to vectors, insects, rodents, or other possible carriers;
- all environmental laws and regulations are complied with; and
- odor or aesthetic nuisances are not created.

In Figure 10.2, a straight pipe from a nearby home discharges untreated sewage that flows from a shallow drainage ditch to a roadside mountain creek in which many children and some adults wade and fish. The clear water (Figure 10.3) is quite deceptive in terms of the health hazard presented. A 4-mile walk along the creek

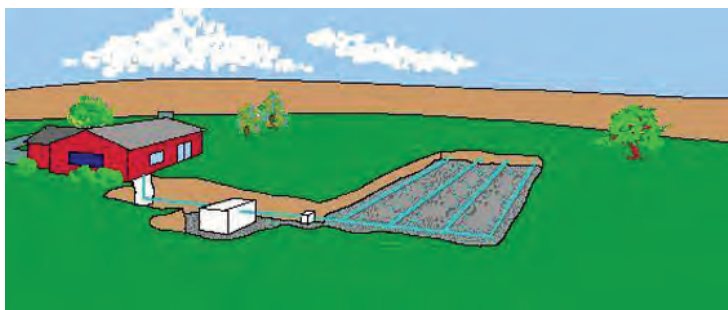


Figure 10.1. Conventional On-site Septic System [2]
Effluent leaves home through a pipe, enters a septic tank, travels through a distribution box to a trench absorption system composed of perforated pipe.



Figure 10.2. Straight Pipe Discharge

Source: Donald Johnson; used with permission.



Figure 10.3. Clear Creek Water Contaminated With Sewage

Source: Donald Johnson; used with permission.

revealed 12 additional pipes that were also releasing untreated sewage. Some people in the area reportedly regard this creek as a source of drinking water.

Raw or untreated domestic wastewater (sewage) is primarily water, containing only 0.1% of impurities that must be treated and removed. Domestic wastewater contains biodegradable organic materials and, very likely, pathogens. The primary purpose of wastewater treatment is to remove impurities and release the treated effluent into the ground or a stream. There are various processes for accomplishing this:

- **Centralized treatment**—Publicly owned treatment works (POTWs) that use primary (physical) treatment and secondary (biologic) treatment on a large scale to treat flows of up to millions of gallons or liters per day,
- **Treatment on-site**—Septic tanks and absorption fields or variations thereof, and
- **Stabilization ponds (lagoons)**—Centralized treatment for populations of 10,000 or less when soil conditions are marginal and land space is ample.

Not included are pit privies and compost toilets.

Epidemiology

John Snow, a London physician, was among the first to use anesthesia. It is his work in epidemiology, however, that earned him his reputation as a prototype for epidemiologists. Dr. Snow's brief 1849 pamphlet, *On the Mode of Communication of Cholera*, caused no great stir, and his theory that the city's water supply was contaminated was only one of many proposed during the epidemic.

Snow, however, was able to prove his theory in 1854, when another severe epidemic of cholera occurred in London. Through painstaking documentation of cholera cases and correlation of the comparative incidence of cholera among subscribers to the city's two water companies, he showed that cholera occurred much more frequently in customers of one water company. This company drew its water from the lower Thames, which became contaminated with London sewage, whereas the other company obtained water from the upper Thames. Snow's evidence soon gained many converts.

A striking incident during this epidemic has become legendary. In one neighborhood, the intersection of Cambridge Street and Broad Street, the concentration of cholera cases was so great that the number of deaths reached over 500 in 10 days. Snow investigated the situation and concluded that the cases were clustered around the Broad Street pump. He advised an incredulous but panicked assembly of officials to have the pump handle removed, and when this was done, the epidemic was contained. Snow was a skilled practitioner as well as an epidemiologist, and his creative use of the scientific information of his time is an appropriate example for those interested in disease prevention and control [3].

Historically, wastewater disposal systems are categorized as water-carrying and nonwater-carrying. Nonwater-carried human fecal waste can be contained and decomposed on-site, the primary examples being a pit privy or compost toilet. These systems are not practical for individual residences because they are inconvenient and they expose users to inclement weather, biting insects, and odors. Because of the depth of the disposal pit for privies, they may introduce waste directly into groundwater. It should be noted that these types of systems are often used and may be acceptable in low-water-use conditions such as small campsites or along nature trails [4–6].

On-site Wastewater Treatment Systems

As urban sprawl continues and the population increases in rural areas, the cost of building additional sewage disposal systems increases. One of the prime reasons for annexation is to increase the tax base without increasing the cost of municipal government. The governments involved often buy into short-term tax gains at massive long-term costs for eventual infrastructure improvements to annexed communities. Installing septic tank systems is common to provide on-site disposal systems, but it is a temporary solution at best. Because property size must be sufficient to allow space for septic system replacement, the cost to the municipality installing a centralized sewer system will be dramatically increased because of the large lot size.

Two microbiologic processes occur in all methods that attempt to decompose domestic wastewater: anaerobic (by bacteria that do not require oxygen) and aerobic (by bacteria that require oxygen) decomposition. Aerobic decomposition is generally preferred because aerobic bacteria decompose organic matter (sewage) at a rate much faster than do anaerobic bacteria and odors are less likely. Centralized wastewater treatment facilities use aerobic processes, as do most types of lagoons. Septic tank systems use both processes.

Septic Tank Systems

Approximately 21% of American homes are served by on-site sewage disposal systems. Of these, 95% are septic tank field systems. Septic tank systems are used as a means of on-site wastewater treatment in many homes, both in rural and urban areas, in the United States. If maintained and operated within acceptable parameters, they are capable of properly treating wastewater for a limited number of years and will need both routine maintenance and eventually major repairs. Proper placement and installation is a key to the successful operation of any on-

site wastewater treatment system, but septic tank systems have a finite life expectancy and all such systems will eventually fail and need to be replaced. Figure 10.4 shows a typical rural home with a well and a septic system.

Septic tank systems generally are composed of the septic tank, distribution box, absorption field (also known as the soil drain field), and leach field. The septic tank serves three purposes: sedimentation of solids in the wastewater, storage of solids, and anaerobic breakdown of organic materials.

To place the septic tank and absorption field in a way that will not contaminate water wells, groundwater, or streams, the system should be 10 feet from the house and other structures, at least 5 feet from property lines, 50 feet from water wells, and 25 feet from streams. The entire system area should be easily identifiable. There have been occasions when owners have paved or built over the area. The local health code authorities must be consulted on required distances in their area because of soil and groundwater issues.

Aerobic, or aerated, septic systems use a suspended growth wastewater treatment process, and can remove suspended solids that are not removed by simple sedimentation. Under appropriate conditions, aerobic units may also provide for nitrification of ammonia, as well as significant pathogen reduction. Some type of primary treatment usually precedes the aerated tank. The tanks contain an aeration chamber, with either mechanical aerators or blowers, or air diffusers, and an area for final clarification/settling. Aerobic units may be designed as either continuous flow or batch flow systems. The continuous flow type are the most commercially available units.

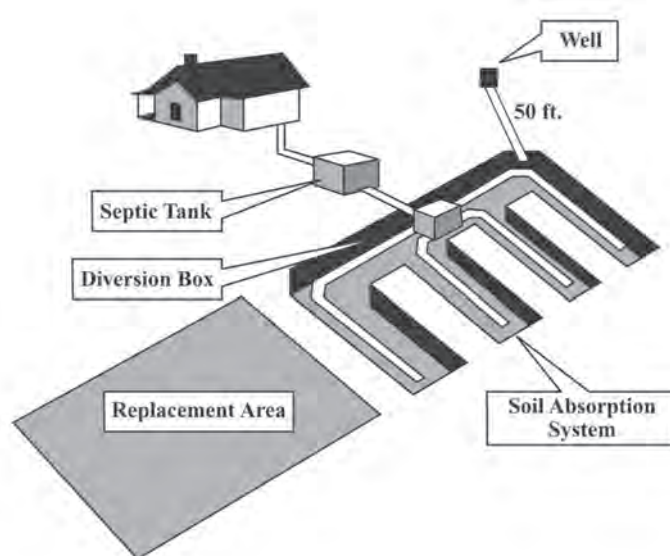


Figure 10.4. Septic Tank System [7]

Effluent from the aerated tank is conveyed either by gravity flow or pumping to either further treatment/ pretreatment processes or to final treatment and disposal in a subsurface soil disposal system. Various types of pretreatment may be used ahead of the aerobic units, including septic tanks and trash traps.

The batch flow system collects and treats wastewater over a period of time, then discharges the settled effluent at the end of the cycle [8].

Aerobic units may be used by individual or clustered residences and establishments for treating wastewater before either further treatment/pretreatment or final on-site subsurface treatment and disposal. These units are particularly applicable where enhanced pretreatment is important, and where there is limited availability of land suitable for final on-site disposal of wastewater effluent. Because of their need for routine maintenance to ensure proper operation and performance, aerobic units may be well-suited for multiple-home or commercial applications, where economies of scale tend to reduce maintenance and/or repair costs per user. The lower organic and suspended solids content of the effluent may allow a reduction of land area requirements for subsurface disposal systems.

A properly functioning septic tank will remove approximately 75% of the suspended solids, oil, and grease from effluent. Because the detention time in the tank is 24 hours or less, there is not a major kill of pathogenic bacteria. The bacteria will be removed in the absorption field (drain field). However, there are soils and soil conditions that prohibit the ability of a drain field to absorb effluent from the septic tank.

Septic tanks are sized to retain the total volume of sewage produced by a household in a 24-hour period. Normally a 1,000-gallon tank is the minimum size to use. State or local codes generally require larger tanks as the potential occupancy of the home increases (e.g., 1,250 gallons for four bedrooms) and may require two tanks in succession when inadequate soils require alternative system installation. Figure 10.5 shows a typical septic tank.

Distribution boxes are not required by most on-site plumbing codes or by the U.S. Environmental Protection Agency. When used, distribution boxes provide a convenient inspection port. In addition, if a split system absorption field is installed (two separate absorption trench systems), the distribution box is a convenient place to install a diversion valve for annually alternating absorption fields.

Absorption Field Site Evaluation

The absorption field has a variety of names, including leach field, tile field, drain field, disposal field, and nitrification field. The effluent from the septic tank is directed to the absorption field for final treatment. The suitability of the soil, along with other factors noted below, determines the best way to properly treat and dispose of the wastewater.

Most, but unfortunately not all, states require areas not served by publicly owned sewers to be preapproved for on-site wastewater disposal before home construction through a permitting process. This process typically requires a site evaluation by a local environmental health specialist, soil scientist, or, in some cases, a private contractor. To assist in the site evaluation process, soil survey maps from the local soil conservation service office may be used to provide general information about soils in the area.

The form shown in Figure 10.6 is typical of those used in conducting a soil evaluation.

Sites for on-site wastewater disposal are first evaluated for use with a conventional septic tank system. Evaluation factors include site topography, landscape position, soil texture, soil structure, internal drainage, depth to rock or other restrictive horizons, and useable area. If the criteria are met, a permit is issued to allow the installation of a conventional septic tank system. Areas that do not meet the criteria for a conventional system may meet less-restrictive criteria for an alternative type of system.

Many sites are unsuitable for any type of on-site wastewater disposal system because of severe topographic limitations, poor soils, or other evaluation criteria. Such sites

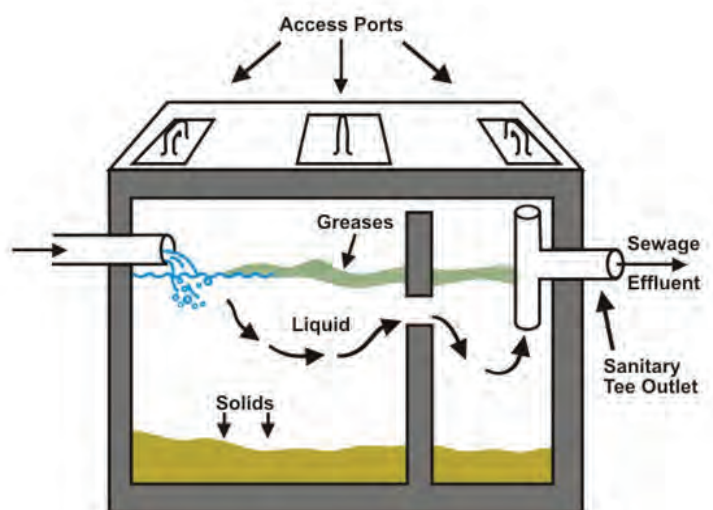


Figure 10.5. Septic Tank [9]

SAMPLE ON-SITE SEWAGE DISPOSAL SYSTEM SITE EVALUATION FORM									
Location _____				Application No. _____					
Owners Name _____				Applicant's Name _____					
Evaluation Factors			Proposed System Area			Alternative Area 1			
1. Topography (slope percent)			S PS U			S PS U			
2. Landscape Position			S PS U			S PS U			
3. Soil Texture and Group			S PS U			S PS U			
4. Soil Structure			S PS U			S PS U			
5. Internal Soil Drainage			S PS U			S PS U			
6. Soil Depth (inches)			S PS U			S PS U			
7. Restrictive Horizons			S PS U			S PS U			
8. Available Space			S PS U			S PS U			
9. Overall Site Classification			S PS U			S PS U			
10. Soil Series (if available)			S PS U			S PS U			
S = Suitable PS = Provisionally Suitable U = Unsuitable									
11. List site and/or system modifications or alternatives required for site approval and the specific area selected for the system. _____									
12. Percolation test required Yes _____ No _____									

Figure 10.6. On-site Sewage Disposal System Site Evaluation Form

should not be used for on-site wastewater disposal because of the high likelihood of system failure.

Some states and localities may require a percolation test as part of the site evaluation process. As a primary evaluation method, percolation tests are a poor indicator of the ability of a soil to treat and move wastewater throughout the year. However, information obtained by percolation tests may be useful when used in conjunction with a comprehensive soil analysis.

Absorption Field Trench

A conventional absorption field trench (Figure 10.7), also known as a rock lateral system, is the most common system used on level land or land with moderate slopes with adequate soil depth above the water table or other restrictive horizons. The effluent from the septic tank flows through solid piping to a distribution box or, in many cases, straight to an absorption field. With the conventional system and most alternative systems, the effluent flows through perforated pipes into gravel-filled trenches and subsequently seeps through the gravel into the soil.

The local regulatory agency should be consulted about the acceptable depth of the absorption field trench. Some states require as much as 4 feet of separation beneath the bottom of the trench and the groundwater. The depth of absorption field trenches should be at least 18 inches, and ideally no deeper than 24 inches. The absorption field pipe should be laid flat with no slope. There should be a

minimum of 12 to 18 inches of acceptable soil below the bottom of the trench to any bedrock, water table, or restrictive horizon. The length of the trench should not exceed 100 feet for systems using a distribution box. Serpentine systems may be several hundred feet long and should be filled with crushed or fragmented clean rock or gravel in the bottom 6 inches of the trench. Perforated 4-inch-diameter pipe is laid on top of the gravel then covered with an additional 2 inches of rock and leveled for a total of 12 inches. A geotextile material or a biodegradable material such as straw should be placed over the gravel before backfilling the trench to prevent soil from clogging the spaces between the rocks.

One or more monitoring ports should be installed in the absorption area extending to the bottom of the gravel to allow measurement of the actual liquid depth in the gravel. This is essential for subsequent testing of the adequacy of the system.

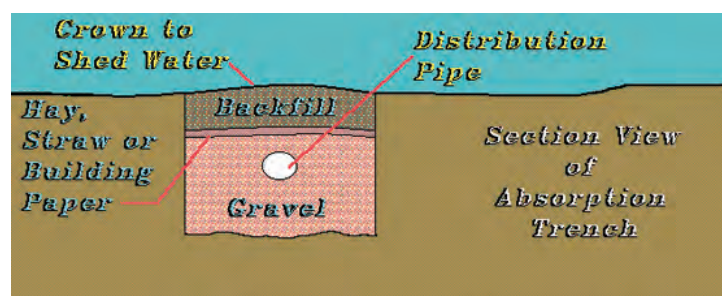


Figure 10.7. Cross-section of an Absorption Field [10]

As a general rule, using longer and narrower trenches to meet square footage requirements produces a better working and longer lasting ground absorption sewage disposal system. Studies have shown that as septic systems age, the majority of effluent absorption by the soil is provided by lateral movement through the trench sidewalls. Longer and narrower trenches (such as 400 feet long by 2 feet wide instead of 200 feet by 4 feet to obtain 800 square feet) greatly increase the sidewall area of the system for lateral movement of wastewater.

Alternative Septic Tank Systems

As the cost of land for home building increases and the availability of land decreases, land that was once considered unsuitable is being developed. This land often has poor soil and drainage properties. Such sites require a considerable amount of engineering skill to design an acceptable wastewater disposal system. In many cases, sites are not acceptable for seepage systems within a reasonable cost. These systems are primarily regulated by state and local government and, before use, approval must be obtained from the appropriate regulatory agencies. Even if a site is approved in one state or county jurisdiction, a similar site may not be approved in another.

The primary difficulty with septic tank systems is treating effluent in slowly permeable or marginal soils. Low-water-use devices, when installed, may make it possible to use a small percentage of septic tank systems in marginal soil. However, low-water-use devices are usually required as part of a larger effort to develop a usable alternative sewage disposal system. Alternative sewage disposal methods that can be used if regular subsurface disposal is not appropriate are numerous [11]. Some of the more common alternative systems are described below.

Mound Systems

A mound system (Table 10.1) is elevated above the natural soil surface to achieve the desired vertical separation from a water table or impervious material. The elevation is accomplished by placing sand fill material on top of the best native soil stratum. At least 1 foot of naturally occurring soil is necessary for a mound system to function properly. Minimizing water usage in the home also is critical to prevent effluent from weeping through the sides of the mound (Figure 10.8).

When a mound system is constructed, the septic tank usually receives wastewater from the house by gravity flow. A lift station is located in the second compartment or in a separate tank to pump the effluent up to the distribution piping in the mound. Floats in the lift station control the size of the pumped effluent dose. An alarm should be installed to alert the homeowner of pump failure so that repairs can be made before the pump tank overfills.

Low-Pressure Pipe Systems

Low-pressure pipe (LPP) systems may also be used where the soil profile is shallow. These systems are similar to mounds except that they use naturally occurring soil as it exists on-site instead of elevating the disposal field with soil fill material. LPP systems are installed with a trenching machine at depths of 12 to 18 inches. The LPP system consists of a septic tank, high-water alarm, pumping tank, supply line, manifold, lateral line, and submersible effluent pump (Figure 10.9).

When septic tank effluent rises to the level of the pump control in the pumping tank, the pump turns on, and effluent moves through the supply line and distribution

Advantages	Disadvantages
May be used in areas with high groundwater, bedrock, or restrictive clay soil near the surface	Must be installed on relatively level lots
Space efficient compared to conventional rock lateral systems	Periodic flushing of the distribution network is required
Allows home building in areas unsuitable for below grade systems	System may be expensive
Water softener wastes, common household chemicals, and detergents are not harmful to this system	System may be difficult to design
	Regular inspection of the pumps and controls necessary to maintain the system in proper working condition

Table 10.1. Mound System Advantages and Disadvantages

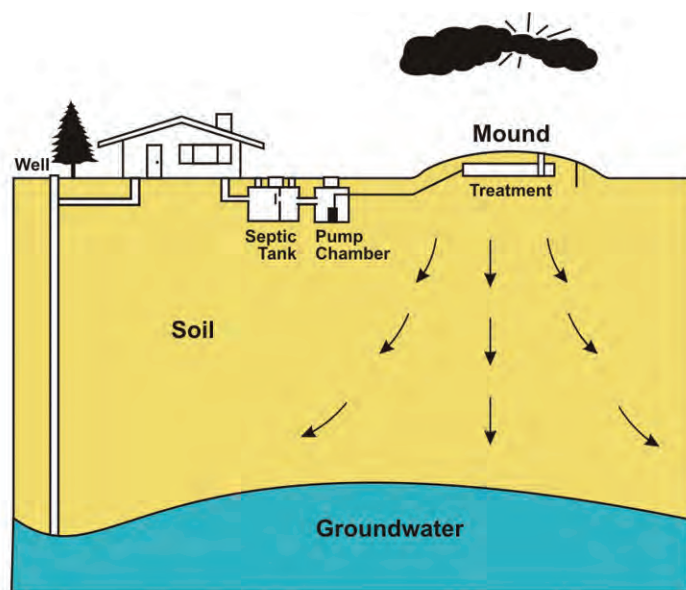


Figure 10.8. Mound System Cutaway [3]

laterals. The laterals contain small holes and are typically placed 3 to 8 feet apart. From the trenches, the effluent moves into the soil where it is treated. The pump turns off when the effluent falls to the lower control. Dosing takes place one to two times daily, depending on the amount of effluent generated. Pump malfunctions set off an alarm to alert the homeowner. The time between doses allows the effluent to be absorbed into the soil and also allows oxygen to reenter the soil to break down solids that may be left behind. If the pump malfunctions, an alarm notifies the homeowner to contact a qualified septic system contractor. The pump must be repaired or replaced quickly to prevent the pump tank from overflowing. Table 10.2 shows the advantages and disadvantages of LPP systems.

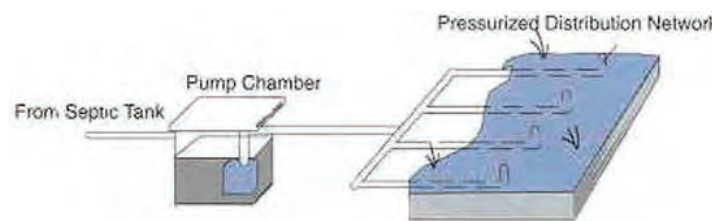


Figure 10.9. Low Pressure On-site System [12]

Plant-rock Filter Systems (Constructed Wetlands)

Considered experimental in some states, plant-rock filter systems are being used with great success in Kentucky, Louisiana, and Michigan. Plant-rock filters generally consist of a septic tank (two-compartment), a rock filter, and a small overflow lateral (absorption) field. Overflow from the septic tank is directed into the rock filter. The rock filter is a long narrow trench (3 to 5 feet wide and 60 to 100 feet long) lined with leak-proof polyvinyl chloride or butylplastic to which rock is added. A 2- to 4-inch-diameter rock is used below the effluent flow line and larger rock above (Figure 10.10).

Plant-rock filter systems are typically sized to allow 1.3 cubic feet of rock area per gallon of total daily waste flow. A typical size for a three-bedroom house would be 468 square feet of interior area. Various width-to-length ratios within the parameters listed above could be used to obtain the necessary square footage. The trenches can even be designed in an “L” shape to accommodate small building lots.

Treatment begins in the septic tank. The partially treated wastewater enters the lined plant-rock filter cell through solid piping, where it is distributed across the cell. The plants within the system introduce oxygen into the waste-

Advantages	Disadvantages
Space requirements are nearly half those of a conventional septic tank system	Some low-pressure pipe systems may gradually accumulate solids at the dead-ends of the lateral lines; therefore, maintenance is required
Can be installed on irregular lot shapes and sizes	Electric components are necessary
Can be installed at shallower depths and requires less top-soil cover	Design and installation may be difficult; installers with experience with such systems should be sought
Provides alternating dosing and resting cycles	
Installation sites are left in their natural condition	

Table 10.2. Low-pressure Pipe Systems Advantages and Disadvantages

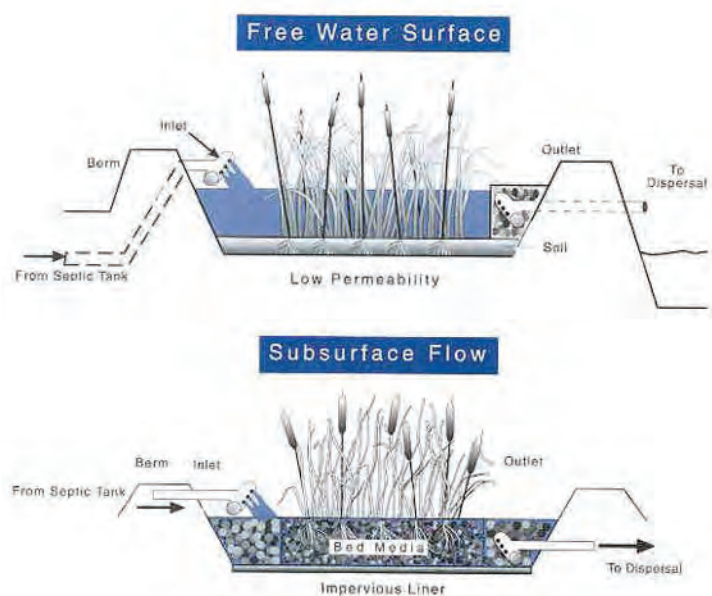


Figure 10.10. Plant-rock Filter system [12]

water through their roots. As the wastewater becomes oxygenated, beneficial microorganisms and fungi thrive on and around the roots, which leads to digestion of organic matter. In addition, large amounts of water are lost through evapotranspiration. The kinds of plants most widely used in these systems include cattails, bulrush, water lilies, many varieties of iris, and nutgrass. Winter temperatures have little effect because the roots are doing the work in these systems, and they stay alive during the winter months. Discharge from wetlands systems may require disinfection. The advantages and disadvantages of the plant-rock filter system are shown in Table 10.3.

Maintaining On-site Wastewater Treatment Systems

Do's and don'ts inside the house:

- Do conserve water. Putting too much water into the septic system can eventually lead to system failure.

(Typical water use is about 60 gallons per day for each person in the family.) The standard drain field is designed for a capacity of 120 gallons per bedroom. If near capacity, systems may not work. Water conservation will extend the life of the system and reduce the chances of system failure.

- Do fix dripping faucets and leaking toilets.
- Do avoid long showers.
- Do use washing machines and dishwashers only for full loads.
- Do not allow the water to run continually when brushing teeth or while shaving.
- Do avoid disposing of the following items down the sink drains or toilets: chemicals, sanitary napkins, tissues, cigarette butts, grease, cooking oil, pesticides, kitty litter, coffee grounds, disposable diapers, stockings, or nylons.
- Do not install garbage disposals.
- Do not use septic tank additives or cleaners. They are unnecessary and some of the chemicals can contaminate the groundwater.

Do's and don'ts for outside maintenance:

- Do maintain adequate vegetative cover over the absorption field.
- Do not allow surface waters to flow over the tank and drain field areas. (Diversion ditches or subsurface tiles may be used to direct water away from system.)
- Do not allow heavy equipment, trucks, or automobiles to drive across any part of the system.
- Do not dig into the absorption field or build additions near the septic system or the repair area.

Advantages	Disadvantages
Approximately one-third the size of conventional septic tank absorption field systems	May be slightly more costly to install Disinfection required for effluent discharge
Can be placed on irregular or segmented lots	May not find installers knowledgeable about the system
May be placed in areas with shallow water tables, high bedrock, or restrictive horizons	Life span of the system is unknown because of its relative newness
Relatively low maintenance	Perception of being unsightly to some

Table 10.3. Plant-rock Filter System Advantages and Disadvantages

- Do make sure a concrete riser (or manhole) is installed over the tank if not within 6 inches of the surface, providing easy access for measuring and pumping solids. (Note: All tanks should have two manholes, one positioned over the inlet device and one over the outlet device.)

There is no need to add any commercial substance to “start” or clean a tank to keep it operating properly. They may actually hinder the natural bacterial action that takes place inside a septic tank. The fecal material, cereal grain, salt, baking soda, vegetable oil, detergents, and vitamin supplements that routinely make their way from the house to the tank are far superior to any additive.

Symptoms of Septic System Problems

These symptoms can mean you have a serious septic system problem:

- Sewage backup in drains or toilets (often a black liquid with a disagreeable odor).
- Slow flushing of toilets. Many of the drains will drain much slower than usual, despite the use of plungers or drain-cleaning products. This also can be the result of a clogged plumbing vent or a nonvented fixture.
- Surface flow of wastewater. Sometimes liquid seeps along the surface of the ground near your septic system. It may or may not have much of an odor and will range from very clear to black in color.
- Lush green grass over the absorption field, even during dry weather. Often, this indicates that an excessive amount of liquid from the system is moving up through the soil, instead of down, as it should. Although some upward movement of liquid from the absorption field is good, too much could indicate major problems.
- The presence of nitrates or bacteria in the drinking water well indicates that liquid from the system may be flowing into the well through the ground or over the surface. Water tests available from the local health department will indicate whether this is a problem.
- Buildup of aquatic weeds or algae in lakes or ponds adjacent to your home. This may indicate that nutrient-rich septic system waste is leaching into the surface water, which may lead to both inconvenience and possible health problems.
- Unpleasant odors around the house. Often, an improperly vented plumbing system or a failing septic system causes a buildup of disagreeable odors.

Table 10.4 is a guide to troubleshooting septic tank problems.

Septic Tank Inspection

The first priority in the inspection process is the safety of the homeowner, neighbors, workers, and anyone else for which the process could create a hazard.

- Do not enter septic tanks or cesspools.
- Do not work alone on these tanks.
- Do not bend or lean over septic tanks or cesspools.
- Note and take appropriate action regarding unsafe tank covers.
- Note unsanitary conditions or maintenance needs (sewage backups, odor, seepage).
- Do not bring sewage-contaminated clothing into the home.
- Have current tetanus inoculations if working in septic tank inspection.

Methane and hydrogen sulfide gases are produced in a septic tank. They are both toxic and explosive. Hydrogen sulfide gas is quite deceptive. It can have a very strong odor one moment, but after exposure, the odor may not be noticed.

Inspection Process

As sewage enters a septic tank, the rate of flow is reduced and heavy solids settle, forming sludge. Grease and other light solids rise to the surface, forming a scum. The sludge and scum (Figure 10.11) are retained and break down while the clarified effluent (liquid) is discharged to the absorption field.

Sludge eventually accumulates in the bottom of all septic tanks. The buildup is slower in warm climates than in colder climates. The only way to determine the sludge depth is to measure the sludge with a probe inserted through an inspection port in the tank's lid. Do not put this job off until the tank fills and the toilet overflows. If this happens, damage to the absorption field could occur and be expensive to repair.

Scum Measurement

The floating scum thickness can be measured with a probe. The scum thickness and the vertical distance from the bottom of the scum to the bottom of the inlet can also be measured. If the bottom of the scum gets within 3 inches of the outlet, scum and grease can enter the absorption field. If grease gets into the absorption field, percolation is impaired and the field can fail. If the scum

Problem	Possible Cause(s)	Remedies
Wastewater backs up into the building or plumbing fixtures sluggish or do not drain well.	Excess water entering the septic tank system, plumbing installed improperly, roots clogging the system, plumbing lines blocked, pump failure, absorption field damaged or crushed by vehicular traffic.	Fix leaks, stop using garbage disposal, clean septic tank and inspect pumps, replace broken pipes, seal pipe connections, avoid planting willow trees close to system lines. Do not allow vehicles to drive over or park over lines. Contact local health department for guidance.
Wastewater surfaces in the yard.	Excess water entering the septic tank system, system blockage, improper system elevations, undersized soil treatment system, pump failure, absorption field damaged or crushed by vehicular traffic.	Fix leaks, clean septic tank and check pumps, make sure distribution box is free of debris and functioning properly, fence off area until problem is fixed, call in experts. Contact local health department for guidance.
Sewage odors indoors.	Sewage surfacing in yard, improper plumbing, sewage backing up in the building, trap under sink dried out, roof vent pipe frozen shut.	Repair plumbing, clean septic tank and check pumps, replace water in drain pipes, thaw vent pipe. Contact local health department for guidance.
Sewage odors outdoors.	Source other than owner's system, sewage surfacing in yard, manhole or inspection pipes damaged or partially removed, downdraft from vent pipes on roof.	Clean tank and check pumps, replace damaged inspection port covers, replace or repair absorption field. Contact local health department for guidance.
Contaminated drinking water or surface water.	System too close to a well, water table, or fractured bedrock; cesspool or dry well being used; improper well construction; broken water supply or wastewater lines. Improperly located wells must be sealed in strict accordance with state and local codes.	Abandon well and locate a new one far and upslope from the septic system, fix all broken lines, stop using cesspool or drywell. Contact local health department for guidance.
Distribution pipes and soil treatment system freeze in winter.	Improper construction, check valve in lift station not working, heavy equipment traffic compacting soil in area, low flow rate, lack of use.	Examine check valve, keep heavy equipment such as cars off area, increase water usage, have friend run water while away on vacation, operate septic tank as a holding tank, do not use antifreeze. Contact local health department for guidance.

Table 10.4. Septic Tank System Troubleshooting

is near the bottom of the tee, the septic tank needs to be cleaned out. The scum thickness can best be measured through the large inspection port. Scum should never be closer than 3 inches to the bottom of the baffle. The scum thickness is observed by breaking through it with a probe, usually a pole.

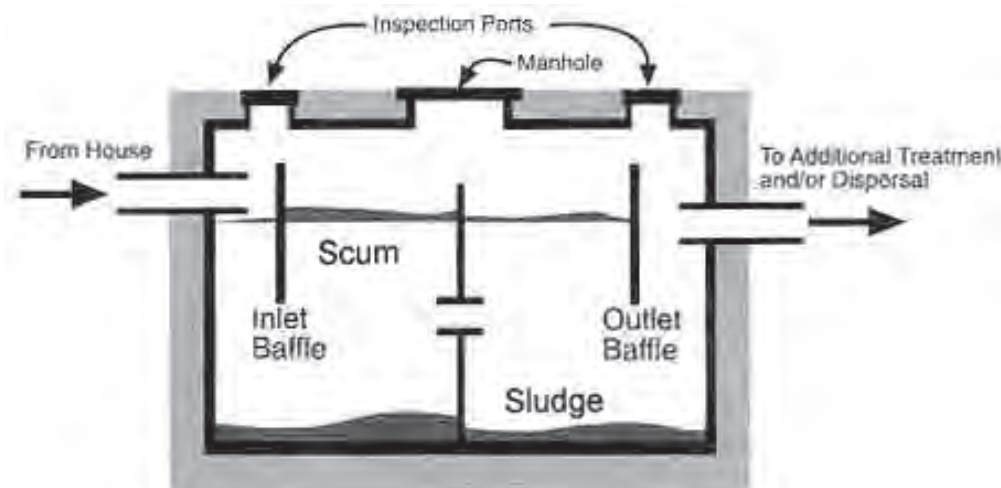


Figure 10.11. Sludge and Scum in Multicompartment Septic Tank [13]

Sludge Measurement

To measure sludge, make a sludge-measuring stick using a long pole with at least 3 feet of white cloth (e.g., an old towel) on the end. Lower the measuring stick into the tank, behind the outlet baffle to avoid scum particles, until it touches the tank bottom. It is best to pump each tank every 2 to 3 years. Annual checking of sludge level is recommended. The sludge level must never be allowed to rise within 6 inches of the bottom of the outlet baffle. In two-compartment tanks, be sure to check both compartments. When a septic tank is pumped, there is no need to deliberately leave any residual solids. Enough will remain after pumping to restart the biologic processes.

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US Army Corps of Engineers. Available from URL: <http://www.usace.army.mil>.

EXHIBIT T



Well Siting & Potential Contaminants

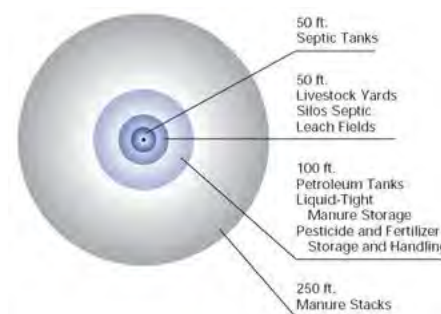
Well Siting (Location)

The safety and effectiveness of a well depends greatly on its location.

It is important to maintain safe distances between private ground water wells and possible sources of contamination.

Possible sources of contamination and minimum distances from wells include:

- Septic Tanks, 50 feet from well
- Livestock yards, Silos, Septic Leach Fields, 50 feet from well
- Petroleum Tanks, Liquid-Tight Manure Storage and Fertilizer Storage and Handling, 100 feet from well
- Manure Stacks, 250 feet from well



Potential Contaminants

Ground water can become unusable if it becomes polluted and is no longer safe to drink. Contaminated ground water can be the result of:

- Microbial contamination (fecal contamination from feedlots)
- High concentrations of naturally-occurring contaminants, such as [arsenic](#) and [radon](#) (depends highly on the geology of the land surrounding the well)
- Local land use practices (fertilizers and pesticides)
- Problems with the integrity of nearby on-site septic systems

To learn more about possible well water contaminants, or if you suspect your wellwater might be contaminated, visit our [diseases and contaminants](#) page.

Septic Tanks

One of the most common sources of well water contamination are failed septic tanks or septic systems. For information on private well water and septic tank considerations, please visit:

- [Your Septic System](#) (Water Systems Council) [PDF – 34KB]
- [Septic Systems](#) (National Ground Water Association)
- [Septic Systems – What to Do After the Flood](#) (Environmental Protection Agency)
- [Septic Systems – SepticSmart Home](#) (Environmental Protection Agency)

Page last reviewed: April 10, 2009

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	NINTH JUDICIAL CIRCUIT
COUNTY OF CHARLESTON	)	
South Carolina Coastal Conservation League and Charleston Waterkeeper,	)	Case No. 2022-CP-10-05192
	)	
Plaintiffs	)	
vs.	)	RETURN TO MOTION FOR
	)	PRELIMINARY INJUNCTION
South Carolina Department of Health and Environmental Control,	)	
	)	
Defendant.	)	
	)	

Defendant, South Carolina Department of Health and Environmental Control (“DHEC” or “Department”), through its undersigned counsel, submits this Return in opposition to the Plaintiffs’ Motion for Preliminary Injunction.

In its Motion, Plaintiffs asks this Court to enjoin “the Department from permitting individual ‘small’ onsite wastewater systems that are part of a LCP or within 200 feet of a Water of the State in the coastal zone during the pendency of this action.” (Plaintiff’s Motion, p. 30).

DEFENDANT DHEC'S RESPONSE

The legal requirements necessary to obtain an injunction are well-established in case law. “A preliminary injunction should issue only if necessary to preserve the status quo ante, and only upon a showing by the moving party that without such relief it will suffer irreparable harm, that it has a likelihood of success on the merits, and that there is no adequate remedy at law.” Poynter Invs., Inc. v. Century Builders of Piedmont, Inc., 387 S.C. 583, 694 S.E.2d 15 (2010).

The Plaintiffs’ Motion is deficient in the following particulars:

Irreparable Harm

Irreparable harm is “not decided by narrow and artificial rules.” Peak v. Spartanburg Reg’l Healthcare Sys., 367 S.C. 450, 455, 626 S.E.2d 34, 36 (Ct. App. 2005) (quoting Kirk v. Clark, 191 S.C. 205, 211, 4 S.E.2d 13, 16 (1939)). The issuance of a “preliminary injunction based only on a possibility of irreparable harm is inconsistent with our characterization of injunctive relief as an extraordinary remedy that may only be awarded upon a clear showing that the plaintiff is entitled to such relief.” Winter v. Nat. Res. Def. Council, Inc., 555 U.S. 7, 22, 129 S.Ct. 365, 375-76 (2008) (citation omitted). “To qualify as irreparable, the feared harm must be ‘neither remote nor speculative, but actual and imminent’[.]” Allee v. Streeval, No. 7:21CV00088, 2021 WL 2784555, at *1 (W.D. Va. July 2, 2021) (quoting Tucker Anthony Realty Corp. v. Schlesinger, 888 F.2d 969, 975 (2d Cir. 1989)). In environmental cases, any injury must be sufficiently likely. S.C. Dep’t of Wildlife & Marine Res. v. Marsh, 866 F.2d 97, 100 (4th Cir. 1989) (quoting Amoco Prod. Co. v. Gambell, 480 U.S. 531, 545, 107 S.Ct. 1396, 1404 (1987)).

The Coastal Zone Management Program subjects wastewater treatment systems and septic tanks that handle more than 1,500 gallons per day or handle other than domestic waste to the Coastal Zone Consistency Certification process. A Small Onsite Wastewater System is not subject to coastal zone consistency review. S.C. Code Ann. Regs. 61-56, Section 101 (defining Small Onsite Wastewater System as “[a]n individual system serving an individual deeded dwelling or business that generates less than fifteen (1500) gpd of domestic wastewater”). The Plaintiffs are seeking a declaration, contrary to established law, that would require the Department to conduct a coastal zone consistency review for each newly-permitted individual Small Onsite Wastewater System. Because this case concerns only newly-permitted individual Small Onsite Wastewater Systems, the actual and imminent harm required to be proven to qualify for injunctive relief must

be from a newly-permitted individual Small Onsite Wastewater Systems and not septic systems in general, regardless of age or condition.

As an initial matter, Plaintiffs neglects to detail the conditions that must be met for a septic permit to be issued by the Department pursuant to S.C. Code Ann. 61-56. The Department has properly addressed the unique characteristics of the coastal zone in accordance with applicable onsite wastewater permitting requirements set forth in S.C. Code Ann. Regs. 61-56, which establishes a comprehensive framework of system standards, permit procedures, minimum conditions, and other requirements safeguard the environment and public health from potential wastewater discharges. (See Affidavit of David R. Vaughan). Specifically, potential sites for an onsite wastewater system are prohibited from permitting when poor soil conditions are present or the site is in close proximity to listed setback conditions, including tidal waters of coastal waters and tidelands critical areas. See S.C. Code Ann. Regs. 61-56, Sections 200.1, 200.2, and 200.6. Because of its comprehensive and well-designed regulatory scheme, S.C. Code Ann. Regs. 61-56 ensures discharge will not be in close proximity to tidal waters or other critical area that could present raised environmental and health hazards in the event of a system malfunction.

Plaintiffs, while commenting on the potential for septic system malfunctions, overlook the factors of (1) age of the onsite wastewater system and (2) when the system was installed. Both factors are significant in evaluating whether a system could potentially malfunction. (See Affidavit of David R. Vaughan). Plaintiffs have merely set forth a remote and speculative fear of harm from the issuance of newly-permitted Small Onsite Wastewater Systems without providing concrete facts demonstrating these systems are likely to malfunction and cause actual and imminent harm.

Lastly, Plaintiffs fail to take into consideration the Department's robust enforcement program. If a complaint is received by DHEC regarding the functioning of an onsite wastewater

system, staff investigates and determines if a discharge of sewage or other domestic wastewater is present. Should a discharge be found, prompt timelines for compliance are issued to the responsible party in order to minimize the risk of any discharge presenting significant harm to the environment and public health. (See Affidavit of Timothy E. Kinney). The Department embraces its mission of protecting the environment and strives to ensure that if a discharge of sewage or other domestic wastewater is found, the situation is remedied as quickly as possible to limit any potential harm to environment and public health.

Plaintiffs have failed to establish a clear showing of the necessary correlation between issuance of a new Small Onsite Wastewater System permit pursuant to S.C. Code Ann. Regs. 61-56 and actual and imminent or irreparable harm.

Likelihood of Success on the Merits

Plaintiffs' argument that they are likely to succeed on the merits of their case relies on Compton v. S.C. Dep't of Corr., 392 S.C. 361, 709 S.E.2d 639 (2011). (Plaintiff's Motion, page 16). Specifically, Plaintiffs point to the Supreme Court's ruling that

“[i]n evaluating whether a plaintiff is entitled to a preliminary injunction, the court must examine the merits of the underlying case only to the extent necessary to determine whether the plaintiff has made a sufficient prima facie showing of entitlement to relief.” Compton v. S.C. Dep't of Corr., 392 S.C. at 367, 709 S.E.2d at 642 (citing Helsel v. City of N. Myrtle Beach, 307 S.C. 29, 32, 413 S.E.2d 824, 826 (1992)). “Once a prima facie showing has been made entitling the plaintiff to injunctive relief, a temporary injunction will be granted without regard to the ultimate termination of the case on the merits.” Helsel, 307 S.C. at 32, 413 S.E.2d at 826. (Plaintiffs' Motion, page 16).

Without articulating how this Court can blatantly ignore the minimum threshold for requiring a CZC Certification (i.e., 1500 gallons per day) set forth in the legally valid and enforceable Coastal Zone Management Program Document (“CMP”), the Plaintiffs make the conclusory assertion that they “are likely to succeed on the merits of their case and have made a prima facie showing

of entitlement to relief.” (Plaintiffs’ Motion, page 16).

Plaintiffs correctly assert that S.C. Code Ann. § 48-39-80 authorizes the Department to “develop a system whereby OCRM shall have the authority to review all state and federal permit applications in the coastal zone, and to certify that these do not contravene the management plan.” However, contrary to Plaintiffs’ allegation, the Department has in fact satisfactorily developed a comprehensive coastal management program through its promulgation of the CMP. The history of the CMP reveals it was approved by the General Assembly in 1979, amended once in 1993, and has been upheld by the South Carolina Supreme Court as valid and enforceable. See, Spectre v. S.C. Dep’t Health & Env’tl. Control, 386 S.C. 357, 688 S.E.2d 844 (2010). Plaintiffs point to the statutory definition of “coastal zone” as part of their argument the Department failed to adequately develop a coastal management program per S.C. Code Ann. § 48-39-80. In particular, Plaintiffs argue that “the Act directs DHEC to take into account ‘all lands and waters in the coastal zone,’ which encompasses all eight coastal counties. S.C. Code Ann. § 48-39-10(B).” Plaintiffs’ assertion wrongfully assumes the Department did not consider the environmental consequences of a minimum threshold in developing the CMP because the Department elected not to require a CZC Certification for all septic tank permits and “small” onsite wastewater systems, but rather only for those that exceed 1500 gallons per day. See Table 1 at CMP V-5.¹ On the contrary, the Department did in fact “[d]evelop a system whereby the department shall have the authority to review all state and federal permit applications in the coastal zone, and to certify that these do not contravene the management plan” in compliance with S.C. Code Ann. § 48-39-80(B)(11). This statutory mandate requires the Department to “*consider* all lands and waters in the coastal zone for planning purposes.” S.C. Code Ann. § 48-39-80(B)(11). (Emphasis added). Manifestly, the Department

¹ See attachment to Chris Stout’s Affidavit.

considered the environmental implications of septic tanks and “small” onsite wastewater systems and concluded that 1500 gallons per day (or less) is the point when a CZC Certification is not required. Plaintiffs’ disagreement with this minimum threshold is not proof of the Department’s noncompliance with S.C. Code Ann. § 48-39-80. In order to find that the Plaintiffs have established even a prima facie showing that they are entitled to relief, the court must ignore the legally valid and enforceable standards set forth in the CMP because the Plaintiffs disagree with the CMP.

No Adequate Remedy at Law

Regarding an adequate remedy at law, the Supreme Court said that “[t]he applicable rule, reaffirmed in almost every case dealing with the matter, is that in the absence of some positive provision of the law to the contrary, *an injunction will not be granted in cases where there is a choice between the ordinary processes of law and the extraordinary remedy by injunction*, and where the remedy at law is sufficient to furnish the injured party the full relief to which he is entitled in the circumstances.” Van Robinson Ins. Agency, Inc. v. Harleysville Mut. Ins. Co., 249 S.E.2d 744, 745 (S.C. 1978) (citing 42 Am.Jur.2d, Injunction, Section 39). (Emphasis added).

The Supreme Court addressed the “adequate remedy” prong of the three-prong Preliminary Injunction test in Poynter Invs., Inc. v. Cent. Builders of Piedmont, Inc., 694 S.E.2d 15 (S.C. 2010). After the trial court determined (as Plaintiffs urge this Court) that changing the language of a disputed document was a legally-justifiable “adequate remedy” when issuing a Preliminary Injunction Order, the Supreme Court reversed the trial court’s Preliminary Injunction and held that

“it would violate public policy to allow a court to insert a geographical limitation [into a non-compete agreement] where none existed. *See Stonhard, Inc. v. Carolina Flooring Spec., Inc.*, 366 S.C. 156, 621 S.E.2d 352 (2005). *Stonhard* held that such a reformation would be void, as *it would add a term to the contract that the parties neither negotiated nor agreed to*. *Id.* The Court of Appeals has held that it would be impermissible to extend the non-compete period contained in the agreement as

a remedy for its breach, since such an extension ‘would *essentially rewrite* the parties' contract, a service the courts of South Carolina do not perform.’ MailSource, LLC, 356 S.C. at 369, 588 S.E.2d at 639 (Ct.App.2003).” Poynter, 694 S.E.2d 15, 17–18 (S.C. 2010). (Emphasis added).

Here, in applying the “adequate remedy at law” prong of the Preliminary Injunction test, the Plaintiffs fail to provide a satisfactory justification for this Court to ignore the “1500 gallons per day” minimum threshold for requiring a CZC Certification as part of the septic tank permitting process set forth in the CMP which has been upheld by the South Carolina Supreme Court as valid and enforceable. While the matter before this Court has nothing to do with a non-compete agreement, the “1500 gallons per day” threshold for requiring a CZC Certification is as clear as the absence of a geographical limitation in the non-compete agreement in Poynter. Using Poynter as guidance, this Court should refrain from “essentially rewrite[ing]” CMP V-5 to suite the Plaintiffs’ preferences. Id. “[I]t is beyond this Court's power to effect a change in the statutes enacted by the Legislature.” Key Corp. Capital, Inc. v. County of Beaufort, 644 S.E.2d 675, 677 (S.C. 2007) (citing State v. Corey D., 339 S.C. 107, 120, 529 S.E.2d 20, 27 (2000); *see also* Keyserling v. Beasley, 322 S.C. 83, 86, 470 S.E.2d 100, 101 (1996) (this Court does “not sit as a superlegislature to second guess the wisdom or folly of decisions of the General Assembly”)). “[A] court’s equitable powers² must yield in the face of an unambiguously worded statute [such as CMP V-5].” Santee Cooper Resort, Inc., v. S.C. Pub. Serv. Comm’n, 298 S.C. 179, 185 379 S.E.2d 119, 123 (1998). Stated another way, when an unambiguously worded statute provides an adequate remedy at law, equitable relief shall not be granted. That is the case in this matter.

² “An action for an injunction is equitable.” LeFurgy v. Long Cove Club Owners Ass’n, Inc., 443 S.E.2d 577, 578 (S.C. App. 1994) (citing Blanks v. Rawson, 296 S.C. 110, 370 S.E.2d 890 (Ct.App.1988)).

CONCLUSION

For the foregoing reasons, this Court should deny the Plaintiffs' Motion for Preliminary Injunction.

Respectfully Submitted,

s/Bradley D. Churdar

Bradley D. Churdar, SC Bar # 12829
South Carolina Department of Health and
Environmental Control
1362 McMillan Avenue, Suite 400
Charleston, SC 29405
(843) 953-0213
churdabd@dhec.sc.gov

Sara V. Martinez, SC Bar #74822
South Carolina Department of Health and
Environmental Control
2600 Bull St.
Columbia, SC 29201
(803) 898-0288
martinsv@dhec.sc.gov

September 1, 2023
Charleston, SC

STATE OF SOUTH CAROLINA)
COUNTY OF CHARLESTON)
IN THE COURT OF COMMON PLEAS
NINTH JUDICIAL CIRCUIT

South Carolina Coastal Conservation)
League and Charleston Waterkeeper,)
Civil Action No: 2022-CP-10-05192

)
Plaintiffs,)

)
vs.)

Affidavit of David R. Vaughan

)
South Carolina Department of Health)
and Environmental Control,)
Defendant.)
_____)

PERSONALLY appeared before me, *David R. Vaughan*, who being duly sworn, deposes and says:

1. I am the Director of the Division of Onsite Wastewater with the Bureau of Environmental Health Services at the South Carolina Department of Health and Environmental Control ("DHEC").

2. I have been with DHEC for 27 years and have been the Director for Onsite Wastewater for 5 years.

3. As part of my duties, I oversee the issuance of permits for Onsite Wastewater systems.

4. DHEC reviews onsite wastewater system permit applications in accordance with applicable permitting requirements set for in S.C. Code Ann. Regs. 61-56, which established a comprehensive framework of system standards, permit procedures, minimum conditions, and other requirements designed to protect the environment and public health from potential wastewater discharges.

5. S.C. Code Ann. 61-56, Section 200 establishes minimum site, soil, and setback conditions that must be met for approval of a permit application.

6. Soils identified as having substantial amounts of expansible layer clay minerals or smectites are unsuitable for onsite wastewater systems and would not be granted a standard onsite wastewater permit.

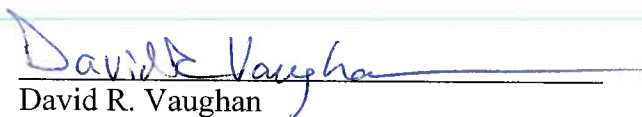
7. No part of an onsite wastewater system shall be installed within 75 linear feet of the delineated critical area line (tidal waters of coastal waters and tidelands critical areas) or within 75 linear feet of the mean high-water elevation of an impounded or natural body of water.

8. S.C. Code Ann. Regs. 61-56 additionally requires the site to have a usable repair or replacement area at least 50 percent the size of the original system available in case of a system malfunction.

9. The age of onsite wastewater systems and when they were installed are significant factors as to whether the system could malfunction and become a source of bacteria and pathogens in coastal waterways.

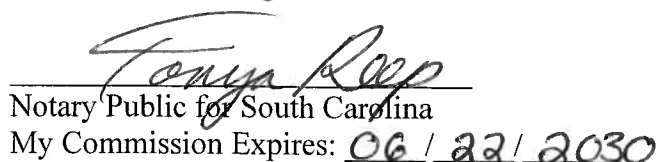
10. S.C. Code Ann. Regs. 61-56 requires property owners to properly maintain in good working order all onsite wastewater system(s) and their parts.

FURTHER affiant sayeth not.



David R. Vaughan
Director, Division of Onsite Wastewater
Bureau of Environmental Health Services
South Carolina Department of Health
and Environmental Control

SWORN to before me this
24th day of August, 2023.



Notary Public for South Carolina
My Commission Expires: 06 / 22 / 2030

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	NINTH JUDICIAL CIRCUIT
COUNTY OF CHARLESTON	)	

South Carolina Coastal Conservation League and Charleston Waterkeeper,	)	Civil Action No: 2022-CP-10-05192

Plaintiffs,	)

vs.	)

Affidavit of Timothy E. Kinney

South Carolina Department of Health and Environmental Control,	)
Defendant.	)

PERSONALLY appeared before me, *Timothy E. Kinney*, who being duly sworn, deposes and says:

1. I am the Director of the Division of Compliance and Customer Support with the Bureau of Environmental Health Services at the South Carolina Department of Health and Environmental Control ("DHEC").

2. I have been the Director of the Division of Compliance and Customer Support with the Bureau of Environmental Health Services for four months and I have been with DHEC for 18 years.

3. As part of my duties, I oversee the compliance and enforcement for the Division of Onsite Wastewater.

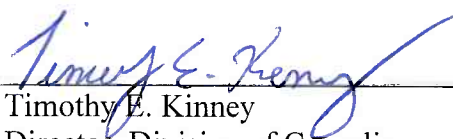
4. Prior to being the Director of the Division of Compliance and Customer Support with the Bureau of Environmental Health Services, I was the Section Manager for the Enforcement Section of Bureau of Environmental Health Services for six years.

5. As part of my duties as the Section Manager for the Enforcement Section of Bureau of Environmental Health Services, I oversaw the compliance and enforcement for the Onsite Wastewater program.

6. The enforcement section of the Division of Compliance and Customer Support is complaint driven.

7. Once a complaint regarding the discharging of sewage or other domestic wastewater is received by DHEC, regional program staff will conduct an investigation. When it has been determined that there is a discharge of sewage or other domestic wastewater, the responsible party is identified and issued a DHEC Notice of Unpermitted/Unapproved Domestic Wastewater Discharge. The responsible party will then have five days to correct the problem and eliminate the discharge. After the expiration of the five days, DHEC regional staff will revisit the site and determine whether the discharge has ceased. If the discharge continues, DHEC regional staff will submit a referral to the Division of Compliance and Customer Support with the Bureau of Environmental Health Services. The Division of Compliance and Customer Support will then review the case and issue an Administrative Order to the responsible party. The Administrative Order will command that the responsible party to eliminate the discharge, within five days of the date of issuance, either by repairing the Onsite Wastewater system or by vacating the property and providing notice to DHEC that the property has been vacated. After the expiration of the appeal period for the Administrative Order, DHEC regional staff will revisit the site to evaluate whether there is a continued discharge of sewage or domestic wastewater. Should a discharge remain present, DHEC will issue a letter to the responsible party demanding immediate compliance with the Administrative Order. If compliance has not been obtained, the matter will be referred to the office of General Counsel to file a Petition for Enforcement with the South Carolina Administrative Law Court.

FURTHER affiant sayeth not.



Timothy E. Kinney
Director, Division of Compliance and Customer
Support
Bureau of Environmental Health Services
South Carolina Department of Health
and Environmental Control

SWORN to before me this
23rd day of August, 2023.



Notary Public for South Carolina

My Commission Expires: 02 / 03 / 2025

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	NINTH JUDICIAL CIRCUIT
COUNTY OF CHARLESTON	)	
South Carolina Coastal Conservation League and Charleston Waterkeeper,	)	Case No. 2022-CP-10-05192
	)	
Plaintiffs	)	
vs.	)	Affidavit of Christopher M. Stout in Support
	)	of Defendant DHEC's <i>Return to Motion</i>
	)	<i>for Preliminary Injunction</i>
South Carolina Department of Health and Environmental Control,	)	
	)	
Defendant.	)	
	)	

PERSONALLY appeared before me, Christopher M. Stout, Manager of the Coastal Zone Consistency Section in the Office of Ocean and Coastal Resource Management at the South Carolina Department of Health and Environmental Control ("Department"), being duly sworn, avers and states that:

1. My name is Christopher M. Stout, and I am submitting this affidavit in support of the Department's *Return to Motion for Preliminary Injunction*.
2. I have worked for the Department since March 2008 in the Office of Ocean and Coastal Resource Management ("OCRM"). In 2018, I was made the Manager of the Coastal Zone Consistency ("CZC") Section.
3. The CZC Section reviews projects for consistency with the policies of the South Carolina Coastal Zone Management Program ("CMP"). In my capacity as the Manager of the CZC Section, I am familiar with the law and policies governing coastal zone consistency reviews, including but not limited to the following: the Coastal Tidelands and Wetlands Act (S.C. Code Ann. §§ 48-39-10 et seq.) and the CMP document.

4. The Coastal Tidelands and Wetlands Act directs the Department to develop a comprehensive coastal management program and to establish regulations and policies for reviewing projects within the Department's critical area authority and within the Department's indirect authority in the coastal zone. The Department has developed such a program which is established in the CMP document.

5. The CMP document was enacted in 1979 in accordance with stringent statutory procedures and has been upheld by the South Carolina Supreme Court as valid and enforceable.

6. In Chapter V of the CMP document, the Department identifies which specific state agency permits are subject to review and certification.

7. The list of permits in the CMP which are subject to review only includes those permits for wastewater treatment systems or septic tanks that handle more than 1,500 gallons per day or handle effluent other than domestic waste (see attached page V-5 [Table 1] from the CZMP document). In other words, the CZC Section does not review permit applications for a wastewater treatment system or septic tank that handles less than 1,500 gallons per day unless it handles effluent other than domestic waste.

8. I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment by contempt.

Further the deponent sayeth not.

Christopher M. Stout

SWORN TO BEFORE me this
13th day of September 2023

Notary Public for South Carolina
My Commission Expires:

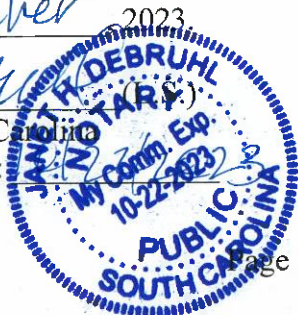


Table 1**State Agency Permits Subject to
Council Review and Certification**

1. Aeronautics Commission	—Certificates of approval for airports and other air traffic facilities.
2. Budget and Control Board	—Permits for activities below the ordinary high water mark which are within the coastal zone but out of the critical areas.
3. Department of Health and Environmental Control	—State permits to construct wastewater treatment systems or septic tanks handling either more than 1500 gallons per day or other than domestic waste. —National Pollutant Discharge Elimination System (NPDES) permits (delegated by EPA). —Section 401 of the Federal Water Pollution Control Act certification. —Construction permits for air emissions. —Water supply permits. —Sanitary Landfill Design, Construction and Operation permits. —Oil and Gas facilities registration certificates.
4. Land Resources Conservation Commission	—Mining operations permits.
5. Public Service Commission	—Certificates for major utility facilities.
6. Water Resources Commission	—Oil and gas facilities permits. —Groundwater capacity use area permits.

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
COUNTY OF CHARLESTON	)	NINTH JUDICIAL CIRCUIT
	)	
South Carolina Coastal Conservation League	)	CASE NO.: 2022-CP-10-05192
and Charleston Waterkeeper,	)	
	)	
Plaintiffs,	)	
	)	PLAINTIFFS' MOTION FOR
v.	)	SUMMARY JUDGMENT
	)	
South Carolina Department of Health and	)	<u>PRIORITY HEARING REQUESTED</u>
Environmental Control,	)	
	)	
Defendant.	)	
	)	
	)	
	)	

PLEASE TAKE NOTICE that Plaintiffs, South Carolina Coastal Conservation League (“the League”) and Charleston Waterkeeper (“the Waterkeeper”), will move at the Court’s convenience for an Order granting summary judgment pursuant to SCRCP 56 in the Plaintiffs’ favor and against Defendant, formerly known as South Carolina Department of Health and Environmental Control (“SCDHEC” or “the Department”), currently known as South Carolina Department of Environmental Services (“SCDES” or “the Department”), declaring that the Department has failed to uphold their statutory duties under S.C. Code 48-39-80(B)(11) as it relates to individual “small” onsite wastewater treatment systems. The Plaintiffs also seek summary judgment for infringing upon the Plaintiffs’ Due Process rights by failing to provide reasonable avenues to be involved in the permitting processes for individual “small” onsite wastewater treatment systems. Further, Plaintiffs respectfully request the Court grant an expedited Order on this “priority matter,” pursuant to SCRCP Rules 40(A)(2) and 40(h) on the grounds that these failures have and will continue to result in extensive negative environmental impacts and the

issues in this case are a matter of significant public interest. It is urgent that the Court rule on these issues.

This motion is based upon the clear and convincing evidence that establishes there are no genuine issues of material fact and Plaintiffs are entitled to judgment as a matter of law regarding its claims for declaratory judgment and injunctive relief. The evidence shows the plain language of S.C. Code 48-39-80(B)(11) has been violated through the Department's absolution of their duty "to review all state and federal permit applications in the coastal zone and certify that these do not contravene the management plan." *Id.*

The clear and convincing evidence also shows the Plaintiffs are entitled to judgment as a matter of law concerning its claim that the Department is violating the Plaintiffs' constitutional due process rights as it relates to public notice of individual "small" onsite wastewater systems. Through the Department's failure to provide public notice of, and to implement a reasonable administrative procedure for, individual "small" onsite wastewater systems, the Department has effectively blocked the Plaintiffs' ability to voice their opposition to the placement of individual "small" onsite wastewater systems in vulnerable coastal areas, that continue to have significant environmental consequences.

This motion is based on the pleadings, discovery responses, sworn affidavits of witnesses on behalf of the Plaintiffs, a memorandum that will be submitted in support of this motion on behalf of the Plaintiffs, and argument of counsel, should the Court allow argument concerning this Motion.

[SIGNATURE PAGE FOLLOWS]

Respectfully submitted,

s/ Leslie S. Lenhardt

Leslie S. Lenhardt

Amy E. Armstrong

S.C. ENVIRONMENTAL LAW PROJECT

510 Live Oak Drive

Mount Pleasant, SC 29464

Telephone: (843) 527-0078

E-mail: leslie@scelp.org

amy@scelp.org

***Attorneys for S.C. Coastal Conservation
League and the Charleston Waterkeeper***

July 19, 2024

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	
COUNTY OF CHARLESTON	)	NINTH JUDICIAL CIRCUIT
	)	
South Carolina Coastal Conservation	)	Case No. 2022-CP-10-05192
League and Charleston Waterkeeper,	)	
	)	
Plaintiffs,	)	MEMORANDUM IN SUPPORT OF
	)	PLAINTIFFS' MOTION FOR
vs.	)	SUMMARY JUDGMENT
	)	
South Carolina Department of Health and	)	
Environmental Control,	)	
	)	
Defendant.	)	

INTRODUCTION

This action was brought against Defendant Department of Health and Environmental Control (“the Department,” now known as the Department of Environmental Services) pursuant to the Uniform Declaratory Judgments Act, S.C. Code Ann. § 15-53-10, *et seq.* Through this motion for summary judgment, Plaintiffs seek a declaratory ruling that the Department has failed and is continuing to fail to follow the plain language of the Coastal Zone Management Act, which requires it to review all state and federal permits for consistency with the state’s Coastal Management Program (“CMP”). S.C. Code 48-39-80(B)(11). Specifically, the Act mandates that the Department “review all state and federal permits in the coastal zone, and to certify that these do not contravene the management plan.” *Id.* Here, the Department has failed to undertake this mandatory Coastal Zone Consistency (“CZC”) review for individual on-site wastewater systems, also known as septic tanks or septic systems. Through this motion, the Plaintiffs also seek a declaratory ruling that recognizes and provides an appropriate remedy for the Defendant’s failure to provide any public notice for septic applications and permits.

As the situation exists today, the Department has been issuing, and will continue to issue, septic system permits for individual dwellings within large residential developments that are sited in close proximity to the State's coastal waterways, without regard for the density or cumulative impacts of such systems in a localized geographic area.

As a result of the Department's failure to give any consideration to these sensitive coastal areas or the cumulative and long-range impacts from such authorizations, our coastal waters have become degraded by septic effluent contamination; such degradation harms the environment, as well as Plaintiffs and other members of the public who utilize these public trust waters for economic, recreational, and aesthetic purposes. Moreover, the Department's failure to provide the public even the minimum level of notice for small individual septic tank permits constitutes a significant violation of Plaintiffs' constitutional Due Process rights.

FACTUAL BACKGROUND

i. Risks of septic systems in coastal areas.

Conventional septic systems treat human waste from individual homes and businesses. They have two primary components: the septic tank and the drainfield. The tank filters out solid wastes which collect within the tank; the rest ("effluent") is released into the septic drainfield, which is simply the soil surrounding the tank. The soils within the drainfield naturally filter out bacteria, viruses, and nutrients from the septic effluent as it percolates through the soil before making its way to ground and surface waters.

Proper functioning of septic systems is highly dependent upon unsaturated soil within the drainfield, adequate soil type and characteristics, sufficient distance between drainfield and water tables, and the size of the drainfield. Multiple soil surveys by the United States Department of Agriculture highlight this fact: "Clayey or wet soils are poorly suited to use as septic tank

absorption fields” and “there must be unsaturated soil material beneath the absorption field to filter the effluent effectively[.]”¹ “Suitability of a soil for septic tanks and sewage-disposal fields depends mainly on its permeability, its depth to water table, and the hazard of flooding. . . . Soils that have a high water table or are likely to be flooded have severe limitations as sites for sewage-disposal fields. . . . [T]he site chosen for construction may be of such limited extent that it will not provide a disposal field of sufficient size to serve the structure that is to be built.”²

Septic systems can malfunction for a variety of reasons. See Ex. A, Aff. of Dr. Jane Harrison; see also Ex. B, Centers for Disease Control & Prevention, et al., Healthy Housing Reference Manual (2006) at 10-10. Although recent data is not available because the Department does not maintain a septic tank inventory of any kind, the Environmental Protection Agency (“EPA”) has estimated that at least twenty percent of septic systems in the United States are malfunctioning to some degree. See Ex. C, Env’tl. Protec. Agency, Stormwater Best Management Practice, EPA-832-F-21-029E (2021). The Department estimates that ten to thirty percent of septic systems fail to work properly in an average year. See Ex. D, S.C. Dep’t Health & Env’tl. Control, Nonpoint Source Management Plan 2020-2024 (2019) at 15.

Malfunctioning septic systems can result in discharges of pathogen-laden human waste and other pollutants into the environment. Human exposure to untreated septic effluent presents public health risks, including disease, infection, and other illnesses. See Ex. A, Aff. of Dr. Jane Harrison. The Centers for Disease Control and Prevention (“CDC”) state that “proper maintenance of septic tanks is a public health necessity. Enteric diseases such as cryptosporidiosis, giardiasis,

¹ United States Dep’t of Agriculture, et al., Soil Survey of Dorchester County, South Carolina (1990) at 51, *available at* <https://www.govinfo.gov/content/pkg/CZIC-s599-s58-e64-1990/html/CZIC-s599-s58-e64-1990.htm> (last visited on April 6, 2023).

² United States Dep’t of Agriculture, et al., Soil Survey: Charleston County, South Carolina (1971) at 58, *available at* <https://nrcs.app.box.com/s/mtk8vlsftgkni0wgt9cez4qonc0fbj0a/file/982760970135> (last visited on April 6, 2023).

salmonellosis, hepatitis A, and shigellosis may be transmitted through human excrement.” Ex. B, CDC et al., Healthy Housing Reference Manual (2006) at 10-1. Accordingly, the EPA has identified the performance of septic systems as a “national issue of great concern.” Ex. E, Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems, EPA 832-B-03-001 (2003).

The CDC cites failing septic systems as one of the most common sources of well water contamination,³ and untreated effluent from septic systems is widely understood to be a major source of surface water contamination in degraded water bodies. See Ex. A, Aff. of Dr. Jane Harrison. The Department routinely acknowledges the same. For example, the Coastal Management Program (“CMP”) provides that “the major negative impact associated with sewage treatment systems is potential water quality degradation from effluent discharge[.]” CMP III-60; see also Ex. D, S.C. Dep’t of Health & Env’tl. Control, Nonpoint Source Management Plan 2020-2024 (2019) at 15 (“Improperly functioning septic systems can be a significant source of NPS [nonpoint source] pollution, particularly in rural areas.”). Further, the Department has acknowledged the contribution of untreated septic effluent as part of its analysis of factors that contribute to the well-documented degraded water quality in James Island Creek. See Ex. F, S.C. Dep’t of Health & Env’tl. Control, Total Maximum Daily Load - James Island Creek, Technical Doc. No. 002-2020 (2019) at 17-18, 26 (discussing failing septic systems as a nonpoint source of pollution in James Island Creek, and estimating the number of existing septic systems within the James Island Creek watershed to be significantly higher than surrounding areas).

Risks of septic malfunction abound in the coastal zone. Septic systems rely on deep, dry soils to properly filter effluent; low-lying coastal areas with shallow groundwater tables, however,

³ Ex. G, Centers for Disease Control & Prevention, Well Siting and Potential Contaminants (2009).

are often not suited for this purpose. Soils in the coastal zone are more prone to saturation due to flooding, coastal storms, storm surge, heavy rainfall, seasonal variances, and sea level rise; further, all of these conditions raise groundwater levels, which can quickly overwhelm septic systems. See Ex. A, Aff. of Dr. Jane Harrison; see also Ex. H, Aff. of Sharon Richardson.

Despite the fact that federal and state policy and law have repeatedly recognized and emphasized the unique, sensitive nature of coastal areas, and despite an enormous body of scientific literature identifying the risks and harms of septic pollution on coastal waterbodies, the Department affords no special consideration of septic systems in the coastal zone, which is particularly problematic in large planned residential developments. Instead, DHEC treats applications throughout the state—from the mountains to the coast—exactly the same. This means, for example, that a septic-dependent development system installed in low-lying areas along the coast must meet the same minimal depth and soil requirements as a septic system placed in a neighborhood in rural Richland County. This approach ignores state policy regarding the unique nature of coastal areas⁴ as well as recognized best management practices for septic tanks. See Ex. A, Aff. of Dr. Jane Harrison; see also Ex. H, Aff. of Sharon Richardson.

As outlined in Plaintiffs' Complaint, the State's coastal waterways are not meeting applicable water quality standards for safe recreational use. See Ex. I, Aff. of Andrew Wunderley. Further, many of the State's shellfish harvesting areas are not meeting the applicable water quality standards for human consumption of fish and shellfish, resulting in restricted or prohibited shellfish harvesting classifications.⁵ This degradation in water quality is correlated with

⁴ See S.C. Coastal Tidelands and Wetlands Act of 1977, S.C. Code Ann. § 48-39-20 & 30.

⁵ See SCDHEC Conditional Shellfish Harvest Closure Application, available at <https://sc-dhec.maps.arcgis.com/apps/webappviewer/index.html?id=f305d270358e426da4e4d9f4c1653df0> (last visited Feb. 27, 2023); see also SCDHEC Shellfish Maps, available at <https://scdhec.gov/food-safety/retail-food/shellfish-monitoring-program-overview/shellfish-maps> (last visited Feb. 27, 2023).

malfunctioning septic systems from nearby residential developments. See Ex. I, Aff. of Andrew Wunderley. The case studies of James Island Creek and Shem Creek provide cautionary tales of how septic systems installed decades ago, and presumably properly functioning at the beginning of their functional life, eventually fail and wreak havoc on Charleston’s coastal waterways, prompting swimming advisories and closures to shellfish harvesting. See Ex. I, Aff. of Andrew Wunderley.

ii. Increased prevalence of large-scale septic-dependent projects in the coastal zone.

The historic use of clustered residential septic systems near coastal waterways has a well-documented history of long-term impacts to water quality. The CMP itself identifies that “[i]ndividual systems such as wells and septic tanks are adequate where development is limited, *but can have major environmental impacts in densely populated areas.*” CMP III-60 (emphasis added). Further, the CMP directs the Department’s Office of Ocean and Coastal Resource Management (“OCRM,” now known as the Bureau of Coastal Management) to authorize septic installations in the coastal zone only for “*low density residential developments when they are designed properly and soils are adequate[.]*” CMP III-16 (emphasis added). Despite this, the Department continues to permit the installation of thousands of densely-placed septic systems, all while skirting coastal zone consistency review.

Increasing development in the coastal zone has long been identified as a problem, even as far back as the inception of the S.C. Coastal Tidelands and Wetlands Act—forty-five years ago—when the General Assembly found that “increasing and competing demands upon the lands and waters of our coastal zone occasioned by population growth and economic development . . . have resulted in the decline or loss of living marine resources, wildlife, nutrient-rich areas, [and] permanent and adverse changes to ecological systems[.]” S.C. Code Ann. § 48-39-20. Indeed,

the State's CMP (1979) cautioned that "[u]rbanization of coastal areas results in greater discharge rates [of domestic sewage] and the estuary and nearshore waters may continue to be the ultimate jump [sic] of sewage and slump discharges in the foreseeable future." CMP IV-96.

Today, this problem has never been truer. Although specific data sets are unavailable due to the lack of historic and current septic system placement records, we know that South Carolina relies more heavily on septic systems for household waste treatment than other states; up to 50% of residents in North and South Carolina rely on onsite wastewater treatment systems, many of which are already concentrated near the coast. See Ex. A, Aff. of Dr. Jane Harrison. Further, coastal counties in South Carolina are experiencing unprecedented population growth. As a result, many tracts identified for large-scale residential development are located outside of municipal sewer service, meaning that developers—often tract builders—are turning to septic for wastewater treatment. These septic-dependent developments—often tract houses—tend to share the common characteristics of high density and small parcel size (less than a one acre, even as small as 0.15 acres), meaning that a large percentage of the developed land is actually comprised of septic drainfields.⁶

iii. Lack of septic system regulation is an additional cause for concern.

Despite the proliferation of septic systems throughout the State, the Department fails to conduct a cumulative review of septic applications in a given area, instead reviewing each application individually and in isolation, even when submitted in large batches by residential developers, near or adjacent to sensitive coastal waters, or in low-lying areas subject to salt water inundation. If applications for individual – “small” septic systems were reviewed for consistency with the CMP—like the agency is required to do for every other state and federal permit in the

⁶ In support, Plaintiffs incorporate by reference Plaintiffs' Motion for Preliminary Injunction filed with this Court.

coastal zone—OCRM would be required to consider the “long-range, cumulative effects of the project, when reviewed in the context of other possible development and the general character of the area.” CMP III-14; see also Ex. H, Aff. of Sharon Richardson.

DHEC has an insufficient record-keeping program in place to keep inventory of installed septic tanks. Simply put, the Department continues to permit thousands of septic systems each year without knowing how many septic systems currently exist in the state, where they are located, when they were installed, or whether or not they are functioning properly. Thus, very little is known about the functionality of installed septic systems in South Carolina. Moreover, this lack of data prevents the Department from considering how historically placed systems may impact pending permitting decisions because it does not know where they are.

Compounding all of the issues above, South Carolina has no state laws or regulations regarding septic maintenance or inspection, meaning that once installed, a septic tank becomes the property owner’s sole responsibility for the rest of its existence. See S.C. Code Ann. Regs. 61-56.101.1 (“Management and maintenance of each [small onsite wastewater system] is the responsibility of the individual property owner.”). According to the EPA, most septic systems malfunction due to inappropriate design or poor maintenance. “Few systems receive proper maintenance because homeowners are either unaware of the need for maintenance or find it a distasteful task.” Ex. E, Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems, EPA 832-B-03-001 (2003). Inspections and maintenance of septic systems must be done with regularity, and there are many considerations to be aware of for proper use (what can and cannot be flushed, volume of water use, drainfield care, avoiding additives, etc.). See Ex. B, CDC et al., Healthy Housing Reference Manual (2006). While some educational resources exist for the public to self-educate, the lack of required or

standardized education and training, operation, maintenance, inspections, monitoring, reporting, and record keeping are additional sources of great concern.

STANDARD OF REVIEW

In Declaratory Judgment cases, “[a] declaratory judgment action is neither legal nor equitable, and therefore, the standard of review is determined by the nature of the underlying issue.” *Crossmann Communities of North Carolina, Inc. v. Harleysville Mut. Ins. Co.*, 395 S.C. 40, 46, 717 S.E.2d 589, 592 (2011). “The judgment sought shall be rendered forthwith if the pleadings, depositions, answer to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the nonmoving party is entitled to a judgment as a matter of law.” Rule 56(c), SCRPC. “Summary judgment is appropriate when there is no genuine issue of material fact, and it is clear the moving party is entitled to a judgment as a matter of law.” *Hancock v. Mid-South Management Co.*, 381 S.C. 326, 330, 673 S.E.2d 801, 802 (2009).

ARGUMENT

I. Declaratory Judgment – Coastal Zone Consistency Review

The statute at issue in this claim for declaratory judgment is S.C. Code 48-39-80(B)(11) which states:

(B) [i]n devising the management program the department shall consider all lands and waters in the coastal zone for planning purposes. In addition, the department shall: . . . (11) [d]evelop a system whereby the department **shall have the authority to review all state and federal permit applications in the coastal zone, and to certify that these do not contravene the management plan.** For individual navigable waters permits for docks located in the eight coastal counties but outside of critical areas, a coastal zone consistency certification is deemed approved if certification review is not completed within thirty days of an administratively complete application.

This statutory provision can be separated into separate mandates to the Defendant: (1) developing a certification review system;; (2) reviewing all state and federal permit applications in the coastal zone and (3) certifying that those permits do not contravene the management plan. In short, the General Assembly sought to have the CMP's coastal rules applied to "all state and federal permits" in the coastal zone, along with a review system for doing so. Here, the Defendant is failing to uphold the plain language of the statute.

Well-established case law directs courts to adhere to the plain language of a statute. *See Spectre, LLC v. S.C. Dep't. of Health & Env't. Control*, 386 S.C. 357, 688 S.E.2d 844 (2010); *Kiawah Development Partner, II v. S.C. Dept. of Health and Env't. Control* 411 S.C. 1635-36, 766 S.E.2d 707, 719 (2014). South Carolina recognizes that, "where [. . .] the plain language of the statute is contrary to the agency's interpretation, the Court will reject the agency's interpretation." *State v. Sweat*, 379 S.C. 367, 374, 665 S.E.2d 645, 649 (Ct. App. 2008), *quoting Brown v. Bi-Lo, Inc.*, 354 S.C. 436, 440, 581 S.E.2d 836, 838 (2003). Here, the Department's failure to review septic tank permits for Coastal Zone Consistency certification, despite the clear language of S.C. Code § 48-39-80, directly contradicts its statutory duty.

a. The Defendant is failing to review all state and federal permit applications in the coastal zone for consistency with the CMP.

Both the Plaintiff and the Defendant in this case recognize "that [the Defendant] is charged with regulating septic tank permits throughout the state, and thus septic tank permits are state permits." Compl. ¶ 21; Resp. ¶ 20; Ex. J, Declaration of SCDHEC, ¶ 5. The Defendant asserts that it need not review and certify permits for septic tanks with flow rates less than 1500 gpd for consistency with the CMP because the CMP itself exempts such permits. CMP V-5, Table 1; Ex. J, Declaration of SCDHEC, ¶ 1.

The Supreme Court of South Carolina has recognized that “an administrative order which materially alters or adds to the law is void,” *Milliken v. S.C. Dep’t of Labor*, 275 S.C. 264, 268 S.E.2d 763, 764 (1980), and that “[a]lthough a regulation has the force of law, it must fall when it alters or adds to a statute.” *S.C. Coastal Conserv. League v. S.C. Dep’t Health & Env’tl. Control*, 390 S.C. 418, 429, 702 S.E.2d 246, 252 (2010). In *Lee v. Michigan Millers Mut. Ins. Co.*, the State Supreme Court stated that “[a]n order cannot be made by an administrative body which would materially alter or add to the law.” *Lee v. Michigan Millers Mut. Ins. Co.*, 250 S.C. 462, 468, 158 S.E.2d 774, 776 (1968); *see also Heyward v. S.C. Tax Comm’n*, 240 S.C. 347, 355-56 126 S.E.2d 15, 20 (1962) (holding that even though an agency was delegated the power to publish rules and regulations to enforce the law, they were not delegated the authority to adopt an alteration that satisfied their own legal theories).

This reasoning applies directly to the unambiguous requirements under S.C. Code § 48-39-80, which mandates the development of a system whereby the Department *shall* review and certify *all* permit applications in the coastal zone. The terms “shall” and “all” leave no room for exemptions, making it clear that the certification process must apply to permit applications for septic tanks generating less than 1,500 gallons per day (gpd) when in the coastal zone. Indeed, the General Assembly knew how to create an exemption from the certification requirement, which it accomplished in § 48-39-80(B)(11) in allowing that for “navigable waters permits for docks located in the eight coastal counties . . . a coastal zone consistency certification is deemed approved if certification review is not completed within thirty days of an administratively complete application.” No other exemption exists in the statute. Thus, to the extent that the Department asserts that the CMP creates an exemption for these individual septic tanks, that is a

material alteration of the statutory requirement that the Department review *all* permits for consistency and must fall.

Additionally, the legislative intent of the statute reinforces this interpretation. The Act was enacted to balance economic development with environmental protection, with a strong emphasis on safeguarding fragile coastal resources. S.C. Code § 48-39-30(B). The CMP was mandated by the Act in order to account for the fact that “the coastal zone . . . may be ecologically fragile and consequently extremely vulnerable to destruction by man’s alterations.” § 48-39-20(D). The Act recognizes that “[i]mportant ecological, cultural, natural, geological and scenic characteristics, industrial, economic and historical values in the coastal zone are being irretrievably damaged or lost by ill-planned development that threatens to destroy these values.” § 48-39-20(E). The Act mandates the Department to protect, restore, and enhance the State’s coastal resources, and Coastal Zone Consistency reviews are a key mechanism for achieving these goals. *Id.* By failing to conduct these reviews, the Department has neglected its role in ensuring that fragile coastal resources receive additional considerations mandated by the General Assembly.

Without undertaking a Coastal Zone Consistency review, the Department has failed to incorporate the specialized knowledge of coastal processes, functions, and values, which OCRM possesses, into its permitting of these coastal septic systems. This disconnect between the Department’s coastal authority and its septic permitting reflects a serious flaw in the agency’s decision-making, which is driven in part by the Department’s failure to conduct Coastal Zone Consistency review for all septic permitting. Consistency review is mandated by statute and is intended to give weight to the unique value of natural resources on the coast, as well as the unique natural forces at play on the coast.

The Defendant, through their absolution of duty in the CMP, failed to meet the statutory requirements of S.C. Code 48-39-80(B)(11). The Defendant is altering the statutory requirement that they “[d]evelop a system whereby the department *shall have the authority to review all* state and federal permit applications in the coastal zone,” by failing review septic tanks that generate less than 1,500 gallons per day of domestic wastewater, S.C. Code 48-39-80(B)(11) (emphasis added). Even in the light most favorable to the Defendant, this absolution is an alteration that must fall.. *See S.C. Coastal Conserv. League v. S.C. Dep’t. Health & Env’t. Control*, 390 S.C. 418, 429, 702 S.E.2d 246, 252 (2010); *Milliken v. S.C. Dep’t. of Labor*, 275 S.C. 264, 268 S.E.2d 763, 764 (1980).

II. Declaratory Judgment - Public Notice

Currently, the Defendant agrees that they do not place applications, or issued permits, for individual septic tanks on public notice. Ex. J, Declaration of SCDHEC, ¶ 4. Administrative agencies such as SCDHEC are required to meet minimum standards of due process. *Stono River Env’t Prot. Ass’n v. S.C. Dep’t Health & Env’t. Control*, 305 S.C. 90, 93-94 (1991) (citing S.C. Const. Art. 1, § 3; *Smith & Smith, Inc. v. S.C. Public Service Comm’n*, 271 S.C. 405 (1978)). The South Carolina Constitution provides that “[n]o person shall be finally bound by a judicial or quasi-judicial decision of an administrative agency affecting private rights except on due notice and an opportunity be heard . . . and he shall have in all such instances the right to judicial review.” S.C. Const., Art. 1, § 22; *see also Kurschner v. City of Camden Plan. Comm’n*, 376 S.C. 165, 171 (2008) (“Procedural due process imposes constraints on governmental decisions which deprive individuals of liberty or property interests within the meaning of the Due Process Clause of the Fifth or Fourteenth Amendment of the United States Constitution.”). “Due process does not require a trial-type hearing in every conceivable case of government impairment of a private interest.

Rather, due process is flexible and calls for such procedural protections as the particular situation demands.” *Kurschner*, 376 S.C. at 171-72 (internal citations omitted); *see also Stono River*, 305 S.C. 90, 93-94 (1991) (citing *Morrissey v. Brewer*, 408 U.S. 471, 481 (1972)).

Further, S.C. Code Section 44-1-60(B), provides: “To the maximum extent possible, the department shall use a uniform system of public notice of permit applications, opportunity for public comment and public hearings.” The purpose of this act “is intended to provide a uniform procedure for contested cases and appeals from administrative agencies.” *S.C. Coastal Conserv. League v. S.C. Dep’t Health & Env’t. Control*, 390 S.C. 418, 429 (2010) (quoting Act No. 387 § 53). To prevail on a claim of denial of due process in an administrative proceeding in South Carolina, there must be a showing of substantial prejudice. *See, e.g., Palmetto Alliance, Inc. v. S.C. Public Serv. Comm’n*, 282 S.C. 430, 435 (1984). The Court may reverse or modify an agency’s decision if the substantial rights of the Plaintiff have been prejudiced because the administrative decisions are: a) in violation of constitutional or statutory provisions; b) in excess of the statutory authority of the agency; c) made upon unlawful procedure; d) affected by other error of law; e) clearly erroneous in view of evidence on the whole record; or f) arbitrary or capricious or characterized by abuse of discretion or clearly unwarranted exercise of discretion. *Myers v. S.C. Dep’t of Health & Hum. Servs.*, 418 S.C. 608, 615 (Ct. App. 2016).

Here, the lack of public notice substantially prejudices the Plaintiffs because they receive no notice of an agency decision and thereby cannot timely challenge that decision, which clearly violates Constitutional due process. The failure to provide public notice for applications or permits creates a system whereby the public cannot engage in decision-making processes that impact their rights. In particular, those rights include recreational uses in and on public trust resource, such as boating, swimming, fishing, and harvesting shellfish. In addition, these unpublished permitting

decisions may impact the affected persons' health, well-being, and property values. In short, affected persons are kept completely in the dark about the state's permitting of septic systems in ecologically sensitive coastal areas that have the potential to harm the quality of their communities and surrounding Environment.

As seen from the following SCDHEC admissions and statutory language, there is no genuine or material fact at issue. SCDHEC admits that individual septic tank permit applications of less than 1,500 gallons per day (gpd) are not placed on public notice. Ex. J, Declaration of SCDHEC, ¶ 4. However, the procedures that do exist at S.C. Code Section 44-1-60, to initiate an appeal do not provide an adequate avenue for affected persons to engage in decision-making processes that implicate their rights. S.C. Code Section 44-1-60 only provides a thirty-day window to challenge the issuance of the permit, meaning affected persons must be aware that an application has been submitted and that SCDHEC has made a permitting decision.⁷ Currently, the only options the public has to obtain such information, in order to knowingly challenge it is to, 1) request septic information under FOIA, or 2) apply to be designated as an affected person under Section 44-1-60(E).

A. Obtaining notice through a FOIA request insufficiently protects due process rights.

The South Carolina Freedom of Information Act (FOIA), mandates that the records of any department of the State, including SCDHEC, be open to the public for inspection. S.C. Code Section 30-4-15. To make a FOIA request, the requester must make a request in writing and pay a fee for the cost of reproduction and personnel costs, which is also subject to inflation based on

⁷ Prior to July 1, 2024, S.C. Code Section 44-1-60 only provided for a fifteen-day window to challenge the issuance of the permit.

the efforts of research and retrieval exerted in fulfilling the request. S.C. Code Section 30-4-30(b). However, the FOIA request process places an impossible burden on affected persons.

For affected individuals to make use of FOIA, they must first be informed that a septic permit application has been filed and that a decision has been made. This alone substantially prejudices Plaintiffs in that they receive no notice of an agency decision, and thereby are likely to be aware of applications and rendered decisions. However, in the event an affected person is put on notice of a permit application by some means other than notice from the Defendant, the affected person must perfectly time a FOIA request concurrently with a septic permit application and/or permit issuance. If a FOIA request is made too soon, no information will be available for the Department to disclose. If a FOIA request is made too late, the thirty-day clock will likely have run by the time the request is fulfilled, precluding an affected person from challenging the staff's decision to issue said permits. Even assuming a FOIA request is perfectly timed, the Department has forty days to respond to a FOIA request, again presenting a substantial likelihood that a permit will have been issued and the fifteen-day clock expired. Thus, FOIA requests are not likely to provide a feasible avenue of obtaining information on septic permits such that affected persons will be able to challenge the permits.

For example, in the proposed developments in Awendaw as outlined in the complaint, the Plaintiffs were unable to obtain information of septic permit applications and decision to be able to knowledgeably challenge the decision despite the Plaintiffs FOIA request to the Defendant. Compl. ¶ 52, 59. The Defendant issued eighty-five individual permits for on-site wastewater systems to Romain Bay Preserve on or about August 4, 2022. The Defendant did not issue public notices for any of these septic tank application, nor did they publicly notice the permit decisions themselves. The Plaintiffs learned of these permits through a FOIA request, which was submitted

on September 12, 2022, and fulfilled on October 11, 2022, well past the fifteen-day window for challenging such decisions (which was applicable at the time, prior to the 2024 restructuring). The avenue of obtaining notice to septic applications and permits cannot be said to sufficiently afford due process when an affected person who stays hypervigilant of potential septic tank permit applications and perfectly times a FOIA request, is unable to challenge the permit because the Defendant does not fulfill the FOIA request in a timely manner. Therefore, in the light most favorable to the Defendant, taking into consideration the deference provided to administrative agencies, this Court should recognize that the FOIA request does not sufficiently provide due process.

B. Obtaining notice by applying to be designated as an affected person insufficiently protects due process.

The Department argues that the General Assembly has established a logical and straightforward statutory procedure to request notice of Department decisions on permitting applications and challenge them that is delineated in Section 44-1-60(E). Under Section 44-1-60(E), notice of a department decision must be sent by certified mail to affected persons who have requested in writing to be notified. However, when one attempts to obtain this designation for a particular tract of land, the Defendant responds that affected person status is only available when there is an active, pending permit application. For example, when undersigned counsel attempted to ask for designation as an affected party regarding the two Awendaw developments referenced in the Complaint, SCDHEC responded as follows:

We [DHEC] also need to know the specific permit applications you want notice of in order to track your request for written notice of a permitting decision. For notices related to any future applications or permits, please resubmit your request at such time as the

applications or permit exist so that the Department will be able to track your request with the specific application or permit. You can monitor for permit applications that are placed on public notice via the Department's website here: <https://scdhec.gov/permits-regulations/public-notices>. For all other permit applications, you may continue to inquire with the Department's FOIA office.

See Ex. K, E-mail from Sara Martinez to Leslie Lenhardt (Sep. 12, 2022). Put simply, requesting to be an affected person is essentially meaningless in this context unless the public knows that someone has actually applied for a septic permit—which, as explained, is effectively impossible to know without public notice. Further, because each septic application is processed individually, an affected party who wishes to challenge the installation of individual “small” septic systems *en masse*, e.g., in the context of a large residential subdivision, would have to submit hundreds of individual Requests for Final Review simultaneously to the Department, even if they are all part of the same development project. *See* S.C. Code Ann. § 44-1-60(E)(2). The uncertainty, impracticality, and inefficiency inherent to the niche administrative processes for individual “small” septic systems render the provisions of Section 44-1-60 an inadequate remedy at law. Therefore, in the light most favorable to the Defendant, taking into consideration the deference provided to administrative agencies, this Court should recognize that applying to be designated as an affected person insufficiently protects due process.

CONCLUSION

For the foregoing reasons, the Plaintiffs respectfully submit that the Court should enter an order granting summary judgment in favor of Plaintiffs acknowledging that the Defendant has failed to uphold their statutory duties under S.C. Code 48-39-80(B)(11) as it relates to individual “small” onsite wastewater treatment systems, and the Defendant has infringed upon the Plaintiffs’

Due Process rights by failing to provide reasonable avenues to be involved in the permitting processes for Individual “small” onsite wastewater treatment systems.

Respectfully submitted,

s/ Monica K. Whalen

Leslie S. Lenhardt, Bar No. 15858

Amy E. Armstrong, Bar No. 70352

Monica K. Whalen, Bar No. 106638

S.C. ENVIRONMENTAL LAW PROJECT

510 Live Oak Drive

Mount Pleasant, SC 29464

Telephone: (843) 527-0078

E-mail: leslie@scelp.org
amy@scelp.org
monica@scelp.org

Attorneys for the Plaintiffs

November 07, 2024

EXHIBIT A

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	
COUNTY OF CHARLESTON	)	NINTH JUDICIAL CIRCUIT
	)	
South Carolina Coastal Conservation League and Charleston Waterkeeper,	)	
	)	Case No. 2022-CP-10-05192
Plaintiffs,	)	
	)	
vs.	)	AFFIDAVIT OF
	)	JANE HARRISON, PH.D.
South Carolina Department of Health and Environmental Control,	)	
	)	
Defendant.	)	
_____	)	

PERSONALLY APPEARED BEFORE ME, Dr. Jane Harrison, who being duly sworn, states as follows:

1. My name is Jane Harrison. I am over the age of eighteen (18) and suffer from no legal incapacity.
2. I reside in Raleigh, North Carolina and have lived there since 2015.
3. I am currently employed by North Carolina Sea Grant (“NC Sea Grant”) where I have worked since 2015. NC Sea Grant is a non-profit research institution founded in 1970 to provide research, education, and outreach opportunities relating to current issues affecting the North Carolina coast and its communities, specifically ocean, coastal, and watershed resource management. NC Sea Grant, which is headquartered at North Carolina State University, is a program within the University of North Carolina System, a multi-campus system encompassing sixteen (16) public universities. NC Sea Grant is also part of the National Sea Grant Network, which receives funding from the National Oceanic and Atmospheric Administration (“NOAA”).

4. My title at NC Sea Grant is Coastal Economics Specialist. In this role, I apply economic analysis and other social science methods to meet the needs of coastal stakeholders, focusing on environmental economics, economic development, sustainable development, and natural resource management. Specifically, I conduct research and outreach on coastal and marine topics like onsite wastewater management, land use implications for water quality, and supporting healthy seafood resources. I manage interdisciplinary research teams that provide guidance to coastal residents, policy makers, and industries on sustainable use of natural resources.
5. I am also employed by North Carolina State University as a graduate faculty member in the College of Natural Resources and an affiliate member in the Agricultural and Resource Economics Department. I teach economic development, a course on the unique development challenges of, and strategies being pursued in, rural and urban areas of North Carolina.
6. My educational background is as follows: I have a B.A. in International Studies and a M.S. in Environmental Economics, both from The Ohio State University. I earned my Ph.D. in Natural Resources Management from Oregon State University in 2012 with a focus on community development in rural areas traditionally dependent on the forest products industry.
7. Prior to my employment at NC Sea Grant, I worked for Wisconsin Sea Grant in Milwaukee, Wisconsin from 2012 to 2015, providing scientific and technical information to promote sustainable use of the Great Lakes' freshwater resources. I also served as a policy analyst for the U.S. Forest Service in Washington, D.C. in 2012.

8. In addition, I am a city councilperson for the Raleigh City Council. I was elected in 2022, and serve as the Chair of the Growth & Natural Resources Committee. In this role, I strive to be both an environmentalist and a proponent of economic growth in the public's interest.
9. I also lead development of the North Carolina Oyster Trail, a non-profit organization which promotes local, sustainable seafood options by providing oyster tourism experiences that help sustain and grow North Carolina's oyster supply and demand, resulting in economic, environmental, and social benefits to the state's seafood industry and coastal communities.
10. I am an expert in environmental economics, natural resource management, and public policy.
11. In my role as Coastal Economics Specialist at NC Sea Grant, I led a research team examining Onsite Wastewater Treatment Systems ("OWTS") in North and South Carolina. The research team was comprised of six (6) doctorate experts in related fields of study, a graduate student, a research assistant, and an attorney. Our work was supported by NC Sea Grant, Eastern Carolina University, North Carolina State University, and the University of Georgia, and was funded by the NOAA Climate Program Office. This project culminated with a 2022 report detailing our findings, entitled "Climate Change and Onsite Wastewater Treatment Systems in the Coastal Carolinas." *See* Attachment A. Specifically, my role in this project included lead author of the report, managing the project and research team, interviewing operators and managers of OWTS to understand function and malfunction, and identifying adaptation measures and opportunities for improvement. In continuation of this work, I present our team's research to local communities, including a December 2022 presentation to stakeholders in James Island, South Carolina, which was

hosted by South Carolina Sea Grant and the South Carolina Department of Natural Resources.

12. Our research and report examined the environmental and economic impacts of OWTS in coastal areas in light of climate impacts and sea level rise. This work incorporated weather and climate risks in OWTS site approval and system selection, and considered the risk of acute OWTS failures due to extreme precipitation, sea level rise, and ground water level changes for oceanfront and inland coastal communities. Our research also included an examination of two case studies—Nags Head, NC and Folly Beach, SC—to illustrate potential adaptation strategies for coastal communities. Key insights are discussed below.
13. OWTS utilize unsaturated soils to treat wastewater before that wastewater enters ground or surface waters. Conventional septic systems (systems with a septic tank and drainfield) are by far the most commonly installed OWTS.
14. OWTS rely on proper conditions for functional, safe treatment of wastewater: siting must account for soil type, structure, minerology, and drainage; drainfield size and depth; and groundwater height and slope.
15. Site conditions in some coastal areas are inadequate for septic, and many OWTS are already at risk of failure.
16. Almost half of residents in the Carolinas rely on OWTS, either individual septic systems or small community cluster systems. Many of these systems are aging, have not been maintained, or were installed with inadequate site conditions, leaving them highly susceptible to malfunction or failure.

17. A variety of factors unique to coastal areas, including sea level rise, precipitation increases, and extreme weather events, will continue to result in significant impacts to the coastal Carolinas and OWTS infrastructure. These factors contribute to overly-saturated conditions, which diminish the ability of coastal soils to treat septic effluent; this leads to septic system failure. For example, extreme rainfall events, such as rainfall associated with hurricanes, have been shown to rapidly increase groundwater levels which can inundate the drainfields of OWTS, leading to direct discharge of wastewater to groundwater.
18. Vertical separation distance beneath the drainfield and groundwater is one of the most critical standards for ensuring adequate treatment of wastewater. To achieve proper treatment, it is generally accepted that wastewater needs to travel through at least twelve (12) inches of unsaturated soil before entering surrounding water; however, even more reliable treatment is achieved with greater depths, i.e., when several feet of unsaturated soil is available.
19. In South Carolina, the minimum required depth for septic drainfields is only six (6) inches. The vertical separation distance is measured at the time of installation, and fails to account for future reductions due to rising groundwater tables, sea level rise, and increasing precipitation. Thus, in the coastal Carolinas, the slim margin of error for vertical separation distance is narrowing or being eliminated completely.
20. Malfunctioning septic systems can be a major source of contamination to water resources in coastal areas, including groundwater, creeks, and estuaries. Bacteria and viruses present in human wastewater can cause disease, infection, and/or severe illness if transmitted to humans by contact or ingestion. Inadequate treatment of septic effluent can result in elevated levels of bacteria, including fecal coliform bacteria, which presents human health

risks and pollutes coastal waterbodies, contributing to the closure of recreational and shellfish harvesting waters. Further, inadequately treated wastewater may contain elevated nutrients, which can travel to ground and surface waters, destabilizing sensitive aquatic ecosystems via eutrophication (an accumulation of minerals and nutrients, particularly phosphorous and nitrogen) and algal blooms, producing toxins that are harmful to both animals and humans (e.g., fish kills). These impacts can further harm local economies by impacting water-based tourism, recreational use, and commercial fishing and shellfish harvesting.

21. Part of our research included interviews and surveys conducted with twenty-eight (28) OWTS managers in coastal counties in North and South Carolina. Our findings suggest several key takeaways regarding OWTS and climate resilience, including: (1) weather and climate are important but unaccounted considerations in site approval and system selection; and (2) current regulations are inadequate to deal with future climate risks.
22. Our report provided eight (8) recommendations for coastal municipalities, government entities, and individuals to develop adaptation strategies for OWTS in light of rising sea levels and a changing climate. The second recommendation is relevant here: “Incorporate weather and climate risk in OWTS site approval and system selection; consider risk of acute failures due to extreme precipitation, sea level rise, and groundwater level changes for oceanfront, sound side, and inland coastal communities.”

Signature page to follow.

Further Affiant sayeth not.

Jane Harrison
Jane Harrison, Ph.D.

SWORN before me this 12th day of April, 2023.

Ashley De Los Santos
Notary Public for North Carolina
My Commission Expires: 03/22/2027

ASHLEY DE LOS SANTOS
Notary Public
Wake Co., North Carolina
My Commission Expires Mar. 22, 2027

EXHIBIT B



U.S. Department of Health and Human Services

U.S. Department of Housing and Urban Development

Healthy Housing Reference Manual



Suggested citation: Centers for Disease Control and Prevention and U.S. Department of Housing and Urban Development. Healthy housing reference manual. Atlanta: US Department of Health and Human Services; 2006.

Use of trade names is for identification only and does not imply endorsement by the Centers for Disease Control and Prevention, the Public Health Service, the U.S. Department of Health and Human Services, or the U.S. Department of Housing and Urban Development.

Cover: Large photo by Teresa M. Sims; small photo by Don W. Johnson.

**Additional copies of this manual can be downloaded from
www.cdc.gov/healthyhomes/publications.html**

Chapter 10: On-site Wastewater Treatment

“Technology has made large populations possible; large populations now make technology indispensable.”

Joseph Wood Krutch, Author, 1932

Introduction

The French are considered the first to use an underground septic tank system in the 1870s. By the mid 1880s, two-chamber, automatic siphoning septic tank systems, similar to those used today, were being installed in the United States. Even now, more than a century later, septic tank systems represent a major household wastewater treatment option. Fully one-fourth to one-third of the homes in the United States use such a system [1].

On-site sewage disposal systems are used in rural areas where houses are spaced so far apart that a sewer system would be too expensive to install, or in areas around cities where the city government has not yet provided sewers to which the homes can connect. In these areas, people install their own private sewage treatment plants. As populations continue to expand beyond the reach of municipal sewer systems, more families are relying on individual on-site wastewater treatment systems and private water supplies. The close proximity of on-site water and wastewater systems in subdivisions and other developed areas, reliance on marginal or poor soils for on-site wastewater disposal, and a general lack of understanding by homeowners about proper septic tank system maintenance pose a significant threat to public health. The expertise on inspecting, maintaining, and installing these systems generally rests with the environmental health staff of the local county or city health departments.

These private disposal systems are typically called septic tank systems. A septic tank is a sewage holding device made of concrete, steel, fiberglass, polyethylene, or other

approved material cistern, buried in a yard, which may hold 1,000 gallons or more of wastewater. Wastewater flows from the home into the tank at one end and leaves the tank at the other (Figure 10.1) [2].

Proper maintenance of septic tanks is a public health necessity. Enteric diseases such as cryptosporidiosis, giardiasis, salmonellosis, hepatitis A, and shigellosis may be transmitted through human excrement. Historically, major epidemics of cholera and typhoid fever were primarily caused by improper disposal of wastewater. The earliest epidemiology lesson learned was through the effort of Dr. John Snow of England (1813–1858) during a devastating cholera epidemic in London [3]. Dr. Snow, known as the father of field epidemiology, discovered that the city's water supply was being contaminated by improper disposal of human waste. He published a brief pamphlet, *On the Mode of Communication of Cholera*, suggesting that cholera is a contagious disease caused by a poison that reproduces in the human body and is found in the vomitus and stools of cholera patients. He believed that the main, although not only, means of transmission was water contaminated with this poison. This differed from the commonly accepted belief at the time that diseases were transmitted by inhaling vapors.

Treatment of Human Waste

Safe, sanitary, nuisance-free disposal of wastewater is a public health priority in all population groups, small and large, rural or urban. Wastewater should be disposed of in a manner that ensures that

- community or private drinking water supplies are not threatened;
- direct human exposure is not possible;
- waste is inaccessible to vectors, insects, rodents, or other possible carriers;
- all environmental laws and regulations are complied with; and
- odor or aesthetic nuisances are not created.

In Figure 10.2, a straight pipe from a nearby home discharges untreated sewage that flows from a shallow drainage ditch to a roadside mountain creek in which many children and some adults wade and fish. The clear water (Figure 10.3) is quite deceptive in terms of the health hazard presented. A 4-mile walk along the creek

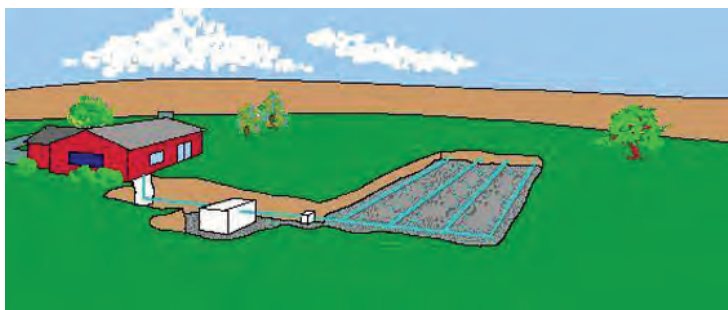


Figure 10.1. Conventional On-site Septic System [2]
Effluent leaves home through a pipe, enters a septic tank, travels through a distribution box to a trench absorption system composed of perforated pipe.



Figure 10.2. Straight Pipe Discharge

Source: Donald Johnson; used with permission.



Figure 10.3. Clear Creek Water Contaminated With Sewage

Source: Donald Johnson; used with permission.

revealed 12 additional pipes that were also releasing untreated sewage. Some people in the area reportedly regard this creek as a source of drinking water.

Raw or untreated domestic wastewater (sewage) is primarily water, containing only 0.1% of impurities that must be treated and removed. Domestic wastewater contains biodegradable organic materials and, very likely, pathogens. The primary purpose of wastewater treatment is to remove impurities and release the treated effluent into the ground or a stream. There are various processes for accomplishing this:

- **Centralized treatment**—Publicly owned treatment works (POTWs) that use primary (physical) treatment and secondary (biologic) treatment on a large scale to treat flows of up to millions of gallons or liters per day,
- **Treatment on-site**—Septic tanks and absorption fields or variations thereof, and
- **Stabilization ponds (lagoons)**—Centralized treatment for populations of 10,000 or less when soil conditions are marginal and land space is ample.

Not included are pit privies and compost toilets.

Epidemiology

John Snow, a London physician, was among the first to use anesthesia. It is his work in epidemiology, however, that earned him his reputation as a prototype for epidemiologists. Dr. Snow's brief 1849 pamphlet, *On the Mode of Communication of Cholera*, caused no great stir, and his theory that the city's water supply was contaminated was only one of many proposed during the epidemic.

Snow, however, was able to prove his theory in 1854, when another severe epidemic of cholera occurred in London. Through painstaking documentation of cholera cases and correlation of the comparative incidence of cholera among subscribers to the city's two water companies, he showed that cholera occurred much more frequently in customers of one water company. This company drew its water from the lower Thames, which became contaminated with London sewage, whereas the other company obtained water from the upper Thames. Snow's evidence soon gained many converts.

A striking incident during this epidemic has become legendary. In one neighborhood, the intersection of Cambridge Street and Broad Street, the concentration of cholera cases was so great that the number of deaths reached over 500 in 10 days. Snow investigated the situation and concluded that the cases were clustered around the Broad Street pump. He advised an incredulous but panicked assembly of officials to have the pump handle removed, and when this was done, the epidemic was contained. Snow was a skilled practitioner as well as an epidemiologist, and his creative use of the scientific information of his time is an appropriate example for those interested in disease prevention and control [3].

Historically, wastewater disposal systems are categorized as water-carrying and nonwater-carrying. Nonwater-carried human fecal waste can be contained and decomposed on-site, the primary examples being a pit privy or compost toilet. These systems are not practical for individual residences because they are inconvenient and they expose users to inclement weather, biting insects, and odors. Because of the depth of the disposal pit for privies, they may introduce waste directly into groundwater. It should be noted that these types of systems are often used and may be acceptable in low-water-use conditions such as small campsites or along nature trails [4–6].

On-site Wastewater Treatment Systems

As urban sprawl continues and the population increases in rural areas, the cost of building additional sewage disposal systems increases. One of the prime reasons for annexation is to increase the tax base without increasing the cost of municipal government. The governments involved often buy into short-term tax gains at massive long-term costs for eventual infrastructure improvements to annexed communities. Installing septic tank systems is common to provide on-site disposal systems, but it is a temporary solution at best. Because property size must be sufficient to allow space for septic system replacement, the cost to the municipality installing a centralized sewer system will be dramatically increased because of the large lot size.

Two microbiologic processes occur in all methods that attempt to decompose domestic wastewater: anaerobic (by bacteria that do not require oxygen) and aerobic (by bacteria that require oxygen) decomposition. Aerobic decomposition is generally preferred because aerobic bacteria decompose organic matter (sewage) at a rate much faster than do anaerobic bacteria and odors are less likely. Centralized wastewater treatment facilities use aerobic processes, as do most types of lagoons. Septic tank systems use both processes.

Septic Tank Systems

Approximately 21% of American homes are served by on-site sewage disposal systems. Of these, 95% are septic tank field systems. Septic tank systems are used as a means of on-site wastewater treatment in many homes, both in rural and urban areas, in the United States. If maintained and operated within acceptable parameters, they are capable of properly treating wastewater for a limited number of years and will need both routine maintenance and eventually major repairs. Proper placement and installation is a key to the successful operation of any on-

site wastewater treatment system, but septic tank systems have a finite life expectancy and all such systems will eventually fail and need to be replaced. Figure 10.4 shows a typical rural home with a well and a septic system.

Septic tank systems generally are composed of the septic tank, distribution box, absorption field (also known as the soil drain field), and leach field. The septic tank serves three purposes: sedimentation of solids in the wastewater, storage of solids, and anaerobic breakdown of organic materials.

To place the septic tank and absorption field in a way that will not contaminate water wells, groundwater, or streams, the system should be 10 feet from the house and other structures, at least 5 feet from property lines, 50 feet from water wells, and 25 feet from streams. The entire system area should be easily identifiable. There have been occasions when owners have paved or built over the area. The local health code authorities must be consulted on required distances in their area because of soil and groundwater issues.

Aerobic, or aerated, septic systems use a suspended growth wastewater treatment process, and can remove suspended solids that are not removed by simple sedimentation. Under appropriate conditions, aerobic units may also provide for nitrification of ammonia, as well as significant pathogen reduction. Some type of primary treatment usually precedes the aerated tank. The tanks contain an aeration chamber, with either mechanical aerators or blowers, or air diffusers, and an area for final clarification/settling. Aerobic units may be designed as either continuous flow or batch flow systems. The continuous flow type are the most commercially available units.

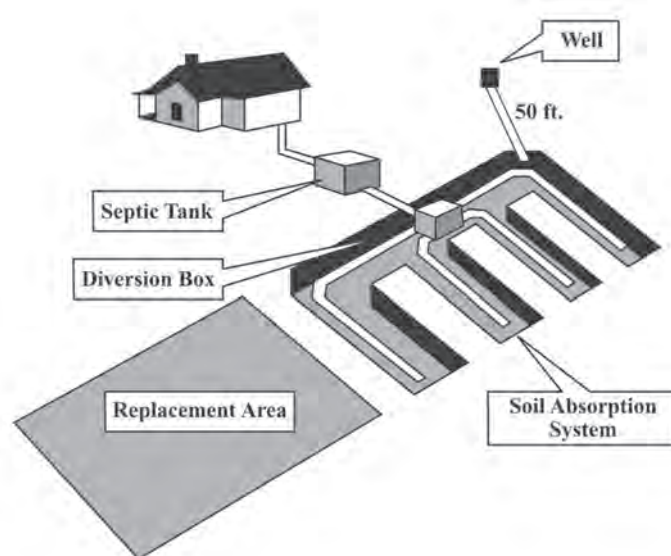


Figure 10.4. Septic Tank System [7]

Effluent from the aerated tank is conveyed either by gravity flow or pumping to either further treatment/ pretreatment processes or to final treatment and disposal in a subsurface soil disposal system. Various types of pretreatment may be used ahead of the aerobic units, including septic tanks and trash traps.

The batch flow system collects and treats wastewater over a period of time, then discharges the settled effluent at the end of the cycle [8].

Aerobic units may be used by individual or clustered residences and establishments for treating wastewater before either further treatment/pretreatment or final on-site subsurface treatment and disposal. These units are particularly applicable where enhanced pretreatment is important, and where there is limited availability of land suitable for final on-site disposal of wastewater effluent. Because of their need for routine maintenance to ensure proper operation and performance, aerobic units may be well-suited for multiple-home or commercial applications, where economies of scale tend to reduce maintenance and/or repair costs per user. The lower organic and suspended solids content of the effluent may allow a reduction of land area requirements for subsurface disposal systems.

A properly functioning septic tank will remove approximately 75% of the suspended solids, oil, and grease from effluent. Because the detention time in the tank is 24 hours or less, there is not a major kill of pathogenic bacteria. The bacteria will be removed in the absorption field (drain field). However, there are soils and soil conditions that prohibit the ability of a drain field to absorb effluent from the septic tank.

Septic tanks are sized to retain the total volume of sewage produced by a household in a 24-hour period. Normally a 1,000-gallon tank is the minimum size to use. State or local codes generally require larger tanks as the potential occupancy of the home increases (e.g., 1,250 gallons for four bedrooms) and may require two tanks in succession when inadequate soils require alternative system installation. Figure 10.5 shows a typical septic tank.

Distribution boxes are not required by most on-site plumbing codes or by the U.S. Environmental Protection Agency. When used, distribution boxes provide a convenient inspection port. In addition, if a split system absorption field is installed (two separate absorption trench systems), the distribution box is a convenient place to install a diversion valve for annually alternating absorption fields.

Absorption Field Site Evaluation

The absorption field has a variety of names, including leach field, tile field, drain field, disposal field, and nitrification field. The effluent from the septic tank is directed to the absorption field for final treatment. The suitability of the soil, along with other factors noted below, determines the best way to properly treat and dispose of the wastewater.

Most, but unfortunately not all, states require areas not served by publicly owned sewers to be preapproved for on-site wastewater disposal before home construction through a permitting process. This process typically requires a site evaluation by a local environmental health specialist, soil scientist, or, in some cases, a private contractor. To assist in the site evaluation process, soil survey maps from the local soil conservation service office may be used to provide general information about soils in the area.

The form shown in Figure 10.6 is typical of those used in conducting a soil evaluation.

Sites for on-site wastewater disposal are first evaluated for use with a conventional septic tank system. Evaluation factors include site topography, landscape position, soil texture, soil structure, internal drainage, depth to rock or other restrictive horizons, and useable area. If the criteria are met, a permit is issued to allow the installation of a conventional septic tank system. Areas that do not meet the criteria for a conventional system may meet less-restrictive criteria for an alternative type of system.

Many sites are unsuitable for any type of on-site wastewater disposal system because of severe topographic limitations, poor soils, or other evaluation criteria. Such sites

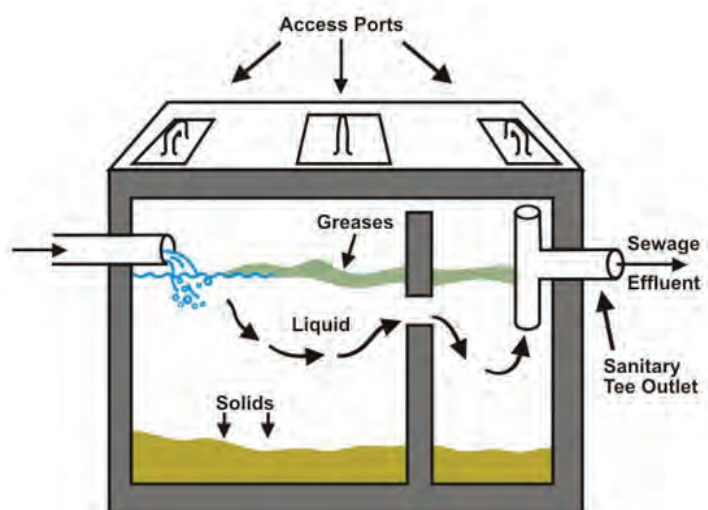


Figure 10.5. Septic Tank [9]

SAMPLE ON-SITE SEWAGE DISPOSAL SYSTEM SITE EVALUATION FORM									
Location _____				Application No. _____					
Owners Name _____				Applicant's Name _____					
Evaluation Factors			Proposed System Area			Alternative Area 1			
1. Topography (slope percent)			S PS U			S PS U			
2. Landscape Position			S PS U			S PS U			
3. Soil Texture and Group			S PS U			S PS U			
4. Soil Structure			S PS U			S PS U			
5. Internal Soil Drainage			S PS U			S PS U			
6. Soil Depth (inches)			S PS U			S PS U			
7. Restrictive Horizons			S PS U			S PS U			
8. Available Space			S PS U			S PS U			
9. Overall Site Classification			S PS U			S PS U			
10. Soil Series (if available)			S PS U			S PS U			
S = Suitable PS = Provisionally Suitable U = Unsuitable									
11. List site and/or system modifications or alternatives required for site approval and the specific area selected for the system. _____									
12. Percolation test required Yes _____ No _____									

Figure 10.6. On-site Sewage Disposal System Site Evaluation Form

should not be used for on-site wastewater disposal because of the high likelihood of system failure.

Some states and localities may require a percolation test as part of the site evaluation process. As a primary evaluation method, percolation tests are a poor indicator of the ability of a soil to treat and move wastewater throughout the year. However, information obtained by percolation tests may be useful when used in conjunction with a comprehensive soil analysis.

Absorption Field Trench

A conventional absorption field trench (Figure 10.7), also known as a rock lateral system, is the most common system used on level land or land with moderate slopes with adequate soil depth above the water table or other restrictive horizons. The effluent from the septic tank flows through solid piping to a distribution box or, in many cases, straight to an absorption field. With the conventional system and most alternative systems, the effluent flows through perforated pipes into gravel-filled trenches and subsequently seeps through the gravel into the soil.

The local regulatory agency should be consulted about the acceptable depth of the absorption field trench. Some states require as much as 4 feet of separation beneath the bottom of the trench and the groundwater. The depth of absorption field trenches should be at least 18 inches, and ideally no deeper than 24 inches. The absorption field pipe should be laid flat with no slope. There should be a

minimum of 12 to 18 inches of acceptable soil below the bottom of the trench to any bedrock, water table, or restrictive horizon. The length of the trench should not exceed 100 feet for systems using a distribution box. Serpentine systems may be several hundred feet long and should be filled with crushed or fragmented clean rock or gravel in the bottom 6 inches of the trench. Perforated 4-inch-diameter pipe is laid on top of the gravel then covered with an additional 2 inches of rock and leveled for a total of 12 inches. A geotextile material or a biodegradable material such as straw should be placed over the gravel before backfilling the trench to prevent soil from clogging the spaces between the rocks.

One or more monitoring ports should be installed in the absorption area extending to the bottom of the gravel to allow measurement of the actual liquid depth in the gravel. This is essential for subsequent testing of the adequacy of the system.

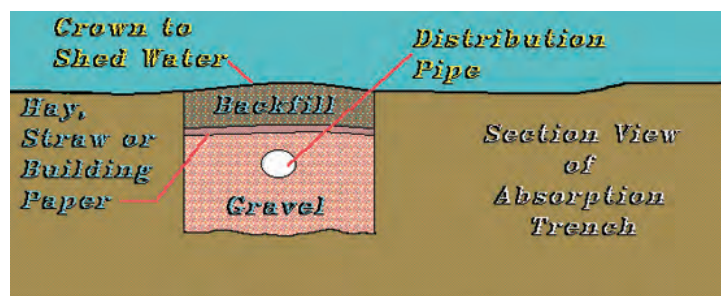


Figure 10.7. Cross-section of an Absorption Field [10]

As a general rule, using longer and narrower trenches to meet square footage requirements produces a better working and longer lasting ground absorption sewage disposal system. Studies have shown that as septic systems age, the majority of effluent absorption by the soil is provided by lateral movement through the trench sidewalls. Longer and narrower trenches (such as 400 feet long by 2 feet wide instead of 200 feet by 4 feet to obtain 800 square feet) greatly increase the sidewall area of the system for lateral movement of wastewater.

Alternative Septic Tank Systems

As the cost of land for home building increases and the availability of land decreases, land that was once considered unsuitable is being developed. This land often has poor soil and drainage properties. Such sites require a considerable amount of engineering skill to design an acceptable wastewater disposal system. In many cases, sites are not acceptable for seepage systems within a reasonable cost. These systems are primarily regulated by state and local government and, before use, approval must be obtained from the appropriate regulatory agencies. Even if a site is approved in one state or county jurisdiction, a similar site may not be approved in another.

The primary difficulty with septic tank systems is treating effluent in slowly permeable or marginal soils. Low-water-use devices, when installed, may make it possible to use a small percentage of septic tank systems in marginal soil. However, low-water-use devices are usually required as part of a larger effort to develop a usable alternative sewage disposal system. Alternative sewage disposal methods that can be used if regular subsurface disposal is not appropriate are numerous [11]. Some of the more common alternative systems are described below.

Mound Systems

A mound system (Table 10.1) is elevated above the natural soil surface to achieve the desired vertical separation from a water table or impervious material. The elevation is accomplished by placing sand fill material on top of the best native soil stratum. At least 1 foot of naturally occurring soil is necessary for a mound system to function properly. Minimizing water usage in the home also is critical to prevent effluent from weeping through the sides of the mound (Figure 10.8).

When a mound system is constructed, the septic tank usually receives wastewater from the house by gravity flow. A lift station is located in the second compartment or in a separate tank to pump the effluent up to the distribution piping in the mound. Floats in the lift station control the size of the pumped effluent dose. An alarm should be installed to alert the homeowner of pump failure so that repairs can be made before the pump tank overfills.

Low-Pressure Pipe Systems

Low-pressure pipe (LPP) systems may also be used where the soil profile is shallow. These systems are similar to mounds except that they use naturally occurring soil as it exists on-site instead of elevating the disposal field with soil fill material. LPP systems are installed with a trenching machine at depths of 12 to 18 inches. The LPP system consists of a septic tank, high-water alarm, pumping tank, supply line, manifold, lateral line, and submersible effluent pump (Figure 10.9).

When septic tank effluent rises to the level of the pump control in the pumping tank, the pump turns on, and effluent moves through the supply line and distribution

Advantages	Disadvantages
May be used in areas with high groundwater, bedrock, or restrictive clay soil near the surface	Must be installed on relatively level lots
Space efficient compared to conventional rock lateral systems	Periodic flushing of the distribution network is required
Allows home building in areas unsuitable for below grade systems	System may be expensive
Water softener wastes, common household chemicals, and detergents are not harmful to this system	System may be difficult to design
	Regular inspection of the pumps and controls necessary to maintain the system in proper working condition

Table 10.1. Mound System Advantages and Disadvantages

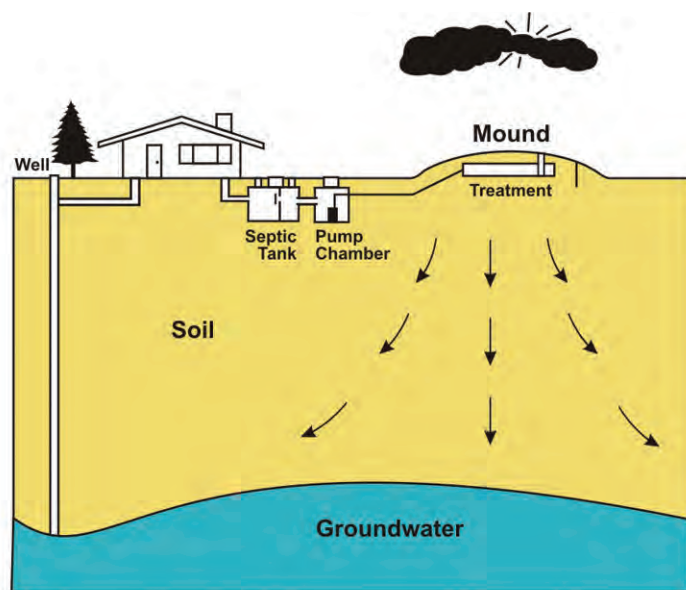


Figure 10.8. Mound System Cutaway [3]

laterals. The laterals contain small holes and are typically placed 3 to 8 feet apart. From the trenches, the effluent moves into the soil where it is treated. The pump turns off when the effluent falls to the lower control. Dosing takes place one to two times daily, depending on the amount of effluent generated. Pump malfunctions set off an alarm to alert the homeowner. The time between doses allows the effluent to be absorbed into the soil and also allows oxygen to reenter the soil to break down solids that may be left behind. If the pump malfunctions, an alarm notifies the homeowner to contact a qualified septic system contractor. The pump must be repaired or replaced quickly to prevent the pump tank from overflowing. Table 10.2 shows the advantages and disadvantages of LPP systems.

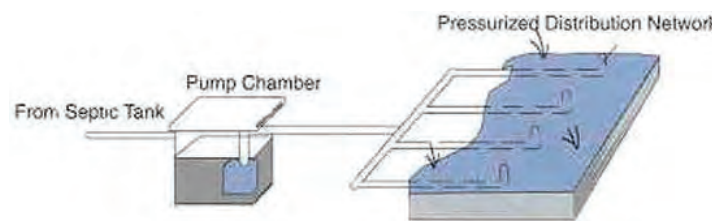


Figure 10.9. Low Pressure On-site System [12]

Plant-rock Filter Systems (Constructed Wetlands)

Considered experimental in some states, plant-rock filter systems are being used with great success in Kentucky, Louisiana, and Michigan. Plant-rock filters generally consist of a septic tank (two-compartment), a rock filter, and a small overflow lateral (absorption) field. Overflow from the septic tank is directed into the rock filter. The rock filter is a long narrow trench (3 to 5 feet wide and 60 to 100 feet long) lined with leak-proof polyvinyl chloride or butylplastic to which rock is added. A 2- to 4-inch-diameter rock is used below the effluent flow line and larger rock above (Figure 10.10).

Plant-rock filter systems are typically sized to allow 1.3 cubic feet of rock area per gallon of total daily waste flow. A typical size for a three-bedroom house would be 468 square feet of interior area. Various width-to-length ratios within the parameters listed above could be used to obtain the necessary square footage. The trenches can even be designed in an “L” shape to accommodate small building lots.

Treatment begins in the septic tank. The partially treated wastewater enters the lined plant-rock filter cell through solid piping, where it is distributed across the cell. The plants within the system introduce oxygen into the waste-

Advantages	Disadvantages
Space requirements are nearly half those of a conventional septic tank system	Some low-pressure pipe systems may gradually accumulate solids at the dead-ends of the lateral lines; therefore, maintenance is required
Can be installed on irregular lot shapes and sizes	Electric components are necessary
Can be installed at shallower depths and requires less top-soil cover	Design and installation may be difficult; installers with experience with such systems should be sought
Provides alternating dosing and resting cycles	
Installation sites are left in their natural condition	

Table 10.2. Low-pressure Pipe Systems Advantages and Disadvantages

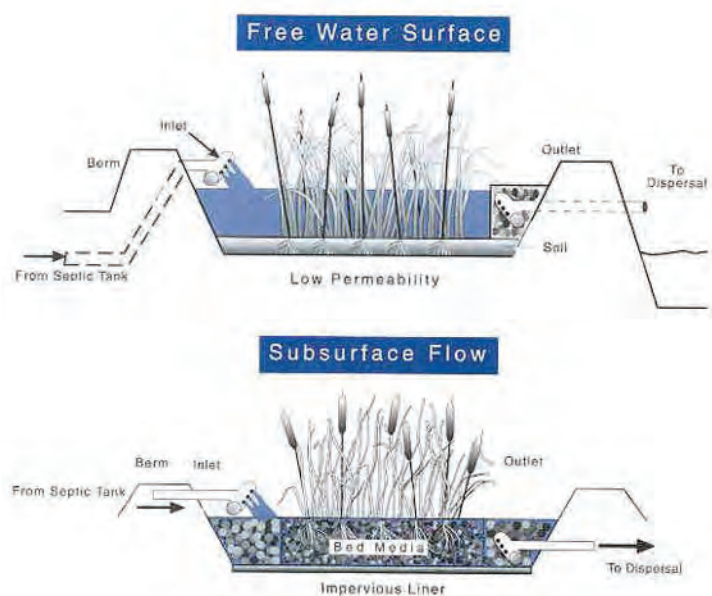


Figure 10.10. Plant-rock Filter system [12]

water through their roots. As the wastewater becomes oxygenated, beneficial microorganisms and fungi thrive on and around the roots, which leads to digestion of organic matter. In addition, large amounts of water are lost through evapotranspiration. The kinds of plants most widely used in these systems include cattails, bulrush, water lilies, many varieties of iris, and nutgrass. Winter temperatures have little effect because the roots are doing the work in these systems, and they stay alive during the winter months. Discharge from wetlands systems may require disinfection. The advantages and disadvantages of the plant-rock filter system are shown in Table 10.3.

Maintaining On-site Wastewater Treatment Systems

Do's and don'ts inside the house:

- Do conserve water. Putting too much water into the septic system can eventually lead to system failure.

(Typical water use is about 60 gallons per day for each person in the family.) The standard drain field is designed for a capacity of 120 gallons per bedroom. If near capacity, systems may not work. Water conservation will extend the life of the system and reduce the chances of system failure.

- Do fix dripping faucets and leaking toilets.
- Do avoid long showers.
- Do use washing machines and dishwashers only for full loads.
- Do not allow the water to run continually when brushing teeth or while shaving.
- Do avoid disposing of the following items down the sink drains or toilets: chemicals, sanitary napkins, tissues, cigarette butts, grease, cooking oil, pesticides, kitty litter, coffee grounds, disposable diapers, stockings, or nylons.
- Do not install garbage disposals.
- Do not use septic tank additives or cleaners. They are unnecessary and some of the chemicals can contaminate the groundwater.

Do's and don'ts for outside maintenance:

- Do maintain adequate vegetative cover over the absorption field.
- Do not allow surface waters to flow over the tank and drain field areas. (Diversion ditches or subsurface tiles may be used to direct water away from system.)
- Do not allow heavy equipment, trucks, or automobiles to drive across any part of the system.
- Do not dig into the absorption field or build additions near the septic system or the repair area.

Advantages	Disadvantages
Approximately one-third the size of conventional septic tank absorption field systems	May be slightly more costly to install Disinfection required for effluent discharge
Can be placed on irregular or segmented lots	May not find installers knowledgeable about the system
May be placed in areas with shallow water tables, high bedrock, or restrictive horizons	Life span of the system is unknown because of its relative newness
Relatively low maintenance	Perception of being unsightly to some

Table 10.3. Plant-rock Filter System Advantages and Disadvantages

- Do make sure a concrete riser (or manhole) is installed over the tank if not within 6 inches of the surface, providing easy access for measuring and pumping solids. (Note: All tanks should have two manholes, one positioned over the inlet device and one over the outlet device.)

There is no need to add any commercial substance to “start” or clean a tank to keep it operating properly. They may actually hinder the natural bacterial action that takes place inside a septic tank. The fecal material, cereal grain, salt, baking soda, vegetable oil, detergents, and vitamin supplements that routinely make their way from the house to the tank are far superior to any additive.

Symptoms of Septic System Problems

These symptoms can mean you have a serious septic system problem:

- Sewage backup in drains or toilets (often a black liquid with a disagreeable odor).
- Slow flushing of toilets. Many of the drains will drain much slower than usual, despite the use of plungers or drain-cleaning products. This also can be the result of a clogged plumbing vent or a nonvented fixture.
- Surface flow of wastewater. Sometimes liquid seeps along the surface of the ground near your septic system. It may or may not have much of an odor and will range from very clear to black in color.
- Lush green grass over the absorption field, even during dry weather. Often, this indicates that an excessive amount of liquid from the system is moving up through the soil, instead of down, as it should. Although some upward movement of liquid from the absorption field is good, too much could indicate major problems.
- The presence of nitrates or bacteria in the drinking water well indicates that liquid from the system may be flowing into the well through the ground or over the surface. Water tests available from the local health department will indicate whether this is a problem.
- Buildup of aquatic weeds or algae in lakes or ponds adjacent to your home. This may indicate that nutrient-rich septic system waste is leaching into the surface water, which may lead to both inconvenience and possible health problems.
- Unpleasant odors around the house. Often, an improperly vented plumbing system or a failing septic system causes a buildup of disagreeable odors.

Table 10.4 is a guide to troubleshooting septic tank problems.

Septic Tank Inspection

The first priority in the inspection process is the safety of the homeowner, neighbors, workers, and anyone else for which the process could create a hazard.

- Do not enter septic tanks or cesspools.
- Do not work alone on these tanks.
- Do not bend or lean over septic tanks or cesspools.
- Note and take appropriate action regarding unsafe tank covers.
- Note unsanitary conditions or maintenance needs (sewage backups, odor, seepage).
- Do not bring sewage-contaminated clothing into the home.
- Have current tetanus inoculations if working in septic tank inspection.

Methane and hydrogen sulfide gases are produced in a septic tank. They are both toxic and explosive. Hydrogen sulfide gas is quite deceptive. It can have a very strong odor one moment, but after exposure, the odor may not be noticed.

Inspection Process

As sewage enters a septic tank, the rate of flow is reduced and heavy solids settle, forming sludge. Grease and other light solids rise to the surface, forming a scum. The sludge and scum (Figure 10.11) are retained and break down while the clarified effluent (liquid) is discharged to the absorption field.

Sludge eventually accumulates in the bottom of all septic tanks. The buildup is slower in warm climates than in colder climates. The only way to determine the sludge depth is to measure the sludge with a probe inserted through an inspection port in the tank's lid. Do not put this job off until the tank fills and the toilet overflows. If this happens, damage to the absorption field could occur and be expensive to repair.

Scum Measurement

The floating scum thickness can be measured with a probe. The scum thickness and the vertical distance from the bottom of the scum to the bottom of the inlet can also be measured. If the bottom of the scum gets within 3 inches of the outlet, scum and grease can enter the absorption field. If grease gets into the absorption field, percolation is impaired and the field can fail. If the scum

Problem	Possible Cause(s)	Remedies
Wastewater backs up into the building or plumbing fixtures sluggish or do not drain well.	Excess water entering the septic tank system, plumbing installed improperly, roots clogging the system, plumbing lines blocked, pump failure, absorption field damaged or crushed by vehicular traffic.	Fix leaks, stop using garbage disposal, clean septic tank and inspect pumps, replace broken pipes, seal pipe connections, avoid planting willow trees close to system lines. Do not allow vehicles to drive over or park over lines. Contact local health department for guidance.
Wastewater surfaces in the yard.	Excess water entering the septic tank system, system blockage, improper system elevations, undersized soil treatment system, pump failure, absorption field damaged or crushed by vehicular traffic.	Fix leaks, clean septic tank and check pumps, make sure distribution box is free of debris and functioning properly, fence off area until problem is fixed, call in experts. Contact local health department for guidance.
Sewage odors indoors.	Sewage surfacing in yard, improper plumbing, sewage backing up in the building, trap under sink dried out, roof vent pipe frozen shut.	Repair plumbing, clean septic tank and check pumps, replace water in drain pipes, thaw vent pipe. Contact local health department for guidance.
Sewage odors outdoors.	Source other than owner's system, sewage surfacing in yard, manhole or inspection pipes damaged or partially removed, downdraft from vent pipes on roof.	Clean tank and check pumps, replace damaged inspection port covers, replace or repair absorption field. Contact local health department for guidance.
Contaminated drinking water or surface water.	System too close to a well, water table, or fractured bedrock; cesspool or dry well being used; improper well construction; broken water supply or wastewater lines. Improperly located wells must be sealed in strict accordance with state and local codes.	Abandon well and locate a new one far and upslope from the septic system, fix all broken lines, stop using cesspool or drywell. Contact local health department for guidance.
Distribution pipes and soil treatment system freeze in winter.	Improper construction, check valve in lift station not working, heavy equipment traffic compacting soil in area, low flow rate, lack of use.	Examine check valve, keep heavy equipment such as cars off area, increase water usage, have friend run water while away on vacation, operate septic tank as a holding tank, do not use antifreeze. Contact local health department for guidance.

Table 10.4. Septic Tank System Troubleshooting

is near the bottom of the tee, the septic tank needs to be cleaned out. The scum thickness can best be measured through the large inspection port. Scum should never be closer than 3 inches to the bottom of the baffle. The scum thickness is observed by breaking through it with a probe, usually a pole.

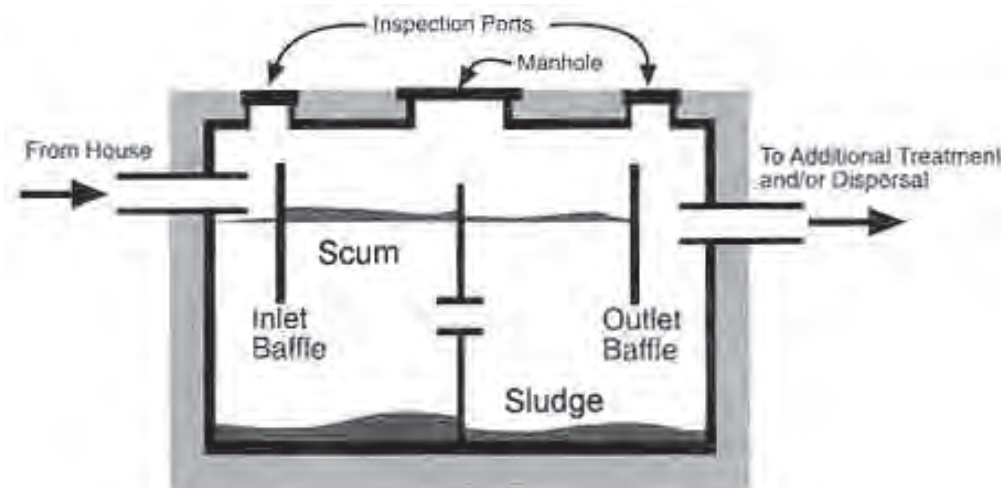


Figure 10.11. Sludge and Scum in Multicompartment Septic Tank [13]

Sludge Measurement

To measure sludge, make a sludge-measuring stick using a long pole with at least 3 feet of white cloth (e.g., an old towel) on the end. Lower the measuring stick into the tank, behind the outlet baffle to avoid scum particles, until it touches the tank bottom. It is best to pump each tank every 2 to 3 years. Annual checking of sludge level is recommended. The sludge level must never be allowed to rise within 6 inches of the bottom of the outlet baffle. In two-compartment tanks, be sure to check both compartments. When a septic tank is pumped, there is no need to deliberately leave any residual solids. Enough will remain after pumping to restart the biologic processes.

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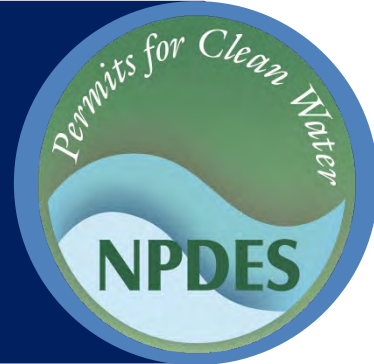
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EXHIBIT C



Stormwater Best Management Practice

Preventing Stormwater Contamination from Septic System Failure



Minimum Measure: Illicit Discharge Detection and Elimination
Subcategory: Decentralized Wastewater

Description

Septic systems, which are a type of decentralized or on-site wastewater system, treat household wastes in areas without access to public sewers or where a sanitary sewer system is not feasible. A typical septic system consists of an underground septic tank and a drainfield. The septic tank collects wastewater from the home and allows solids to settle out as sludge. The wastewater is then directed to the drainfield where it is filtered through the soil and eventually reaches groundwater. Bacteria in the tank help break down the sludge, however, EPA recommends that the sludge be periodically pumped out of the tank for off-site treatment or disposal. An estimated one in five homes relies on on-site septic systems to treat its wastewater—in all, around 4 billion gallons of wastewater per day for the United States (U.S. EPA, 2014). Without proper design and maintenance, a septic system can fail, possibly harming public health and the environment. It can be helpful for Municipal Separate Storm Sewer System (MS4) program managers to understand how septic systems work and how to detect and work with owners to correct failing septic systems, which can release pollutants into the MS4 and directly impact stormwater quality. Stormwater that is high in bacteria, nutrients or optical brighteners discharging from an MS4 may be the first indication of a failing septic or wastewater system in the area.

Even when functioning properly, septic systems can discharge wastewater with pollutant concentrations exceeding established water quality standards. This problem grows when the system lacks proper design or maintenance. More than half of the existing on-site systems are more than 30 years old, and at least 20 percent of systems are malfunctioning to some degree (U.S. EPA, 2003). Such systems contribute significant amounts of pollutants, especially nitrogen and microbiological pathogens, which can then enter the MS4 and discharge into waterways.

Several factors can cause on-site systems to fail, including unsuitable soil conditions, improper design and installation, and inadequate maintenance practices. In



A septic system failure can lead to contamination of surface waters.

most cases, the property owner is not aware of a system failure until sewage backs up into the home or breaks out above ground. Identifying and eliminating failing septic systems helps control untreated wastewater discharges that contaminate groundwater, stormwater and ultimately surface water supplies.

Applicability

Conventional septic systems are in use throughout the United States. They are the most common wastewater treatment method for areas without public sewer systems and wastewater treatment plants.

Siting and Design Considerations

Generally, state and local regulations dictate design and installation requirements. To prevent septic system failure, systems should have proper design, siting and size. Below are basic principles of septic system design to provide a base-level understanding of important considerations in designing and siting a septic system:

- **Lot size.** Conventional septic systems need large lots to allow for uniform effluent distribution across the drainfield. Design engineers should enlarge septic drainfields where soil permeability is low,

steep slopes are present or they expect increases in daily sewage flow.

- **Soil type.** Soil type influences the effluent's ability to percolate through the soil for treatment.
- **Separation distance from the water table.** The location of septic systems should ensure an adequate horizontal separation from surface waters and vertical separation from groundwater. Distances (setbacks) between septic system components and artificial or natural water supplies vary according to local site factors, such as soil percolation rate, grain size and depth to water table. States or local municipalities determine the vertical and horizontal setback requirements for soil absorption fields near building foundations, property boundaries, water supply wells and other surface waters. An individual site assessment before installation is the best way to determine siting distances necessary for efficient on-site wastewater disposal.
- **System size.** To avoid hydraulic overloading, it is necessary to properly size a system. Overloading can cause system backups or force waste through the septic tank before it receives adequate treatment (Perkins, 1989). Overloading can also create anaerobic conditions in the drainfield, reducing the system's ability to treat pathogens, and it might not give solids time to settle out before being pushed through the system.

Many alternatives to conventional septic systems offer improvements in efficiency, treatment capability and footprint. The use of mound or recirculating sand filters can benefit sites with limiting factors such as inadequate lot size, limited separation distances and the presence of problem pollutants like nitrogen. De-nitrification systems or aquaculture systems are useful to control pollutants like nitrogen and phosphorus. Alternating bed systems, mound systems, pressure distribution (low-pressure pipe) systems, sand filter systems or constructed wetlands are useful as retrofits for conventional systems with inadequate siting or size. These different types of systems can handle site-specific problems and decrease the likelihood of septic failure. EPA's [decentralized wastewater systems technology fact sheets](#) provide information about many of these alternative systems. In most cases, individual states approve alternative

treatment systems. An [EPA Web page](#) lists such approvals, organized by state.

Maintenance Considerations

Periodic maintenance of on-site systems ensures their proper functioning. A septic system management program consisting of scheduled pumpouts and regular maintenance is the best way to reduce the possibility of failure. EPA recommends inspecting septic systems every 3 to 5 years. A typical inspection will include (U.S. EPA, 2017):

- Reviewing pumpout and maintenance records.
- Reviewing the age of the system.
- Checking the levels of sludge and scum in the tank.
- Checking for signs of leakage, such as low water levels in the tank.
- Checking for signs of backup, such as staining in the tank above the outlet pipe.
- Checking the integrity of the tank, inlet and outlet pipes.
- Checking the drainfield for signs of system failure like standing water.
- Checking the distribution box to ensure that lines are receiving equal flows.
- Reviewing compliance with local regulations regarding function and location.

Since property owners may not employ routine maintenance practices, agencies may need to establish programs to track pumpout and maintenance requirements. EPA's [voluntary guidelines for decentralized on-site wastewater management](#) include five voluntary management models for programs managing on-site and decentralized wastewater systems. The guidance consists of steps of increasing oversight to help communities and programs that regulate septic systems build effective septic system management programs. The programs below are examples of municipalities that have taken on the responsibility of managing septic systems and have included maintenance-tracking in their plans (U.S. EPA, 2012).

Jamestown, Rhode Island

- In 2001, Jamestown adopted an ordinance to better monitor and manage individual wastewater systems. The program consists of routine inspections, maintenance reminders, an online database, siting and installation rules, and designation of a high groundwater table district.
- The ordinance requires routine inspections of all systems every 3 to 5 years.
- The ordinance gives the town the authority to pump septic systems at the owner's expense.
- Property owners pay an annual \$30 fee to fund the ordinance.

Monroe County, Florida

- In 1999, Florida adopted new wastewater treatment standards to protect the environmentally sensitive ecosystems of Monroe County (the Florida Keys).
- All wastewater systems in Monroe County must now use advanced treatment technologies with designs to achieve an effluent limit of 10 milligrams per liter or less for nitrogen.
- Septic system owners must renew an operating permit annually at a cost of \$100.

Pena Blanca, New Mexico

- Deciding whether to repair or replace 133 of the 185 existing treatment systems or spend \$3.1 million on a centralized sewer system, the community of Pena Blanca formed the Pena Blanca Water and Sanitation District in 1990 and developed a wastewater management program with an emphasis on system maintenance. The program features an operating permit and maintenance contract requirements, mandatory tank pumping every 2 years, and maintenance of system records.
- The Water and Sanitation District retains the authority to pump septic tanks every 2 years, with property owners retaining the option to hire an outside pump service.
- The Water and Sanitation District charges a monthly fee that ranges from \$9 to \$20.

Auburn Lake Trails, California

- In 1985 in response to local soils and topography that had poor suitability for conventional septic tank designs, the community of Auburn Lake Trails authorized the Georgetown Divide Public Utility District to design and manage conventional and advanced individual and clustered wastewater treatment systems. The program consists of operating permit requirements, routine inspection and maintenance requirements, and groundwater and surface water monitoring.
- The district has broad authority to investigate, design, monitor, operate, maintain and repair treatment systems.
- The district charges monthly user fees ranging from \$15 to \$23.

MS4 programs with septic systems should consider addressing failing septic systems by utilizing field screening to pinpoint areas warranting more detailed on-site inspection surveys by the appropriate regulating authority (see common field tests to the right).

EPA has created a Web site that describes [steps for a property owner to take after a system has failed](#). When a septic system has failed and requires replacement, consider connecting to the local sanitary sewer system. This may not be possible in all parts of the country—but where it is feasible, it may be cheaper than installing a

new septic system and provides the highest level of protection to the local environment and public health.

Limitations

Economics affect the ability for a person or a community to repair or replace a failing septic system. Septic owners may not have adequate funding to install new systems. In some cases, rebates or subsidies are available to property owners to replace aging septic systems, install advanced on-site wastewater treatment systems or connect to centralized systems. These

programs vary regionally; consult local or state wastewater authorities for more information.

Reliance on individual on-site inspections to detect failed systems is another major limitation. Individual on-site inspections are labor-intensive and require access to private property to pinpoint the locations of failing systems. Property owners might be reluctant to provide this access, and an ordinance mandating inspection authority may be necessary. Some communities have dealt with access issues through ordinances requiring inspection at time of property transfer to pinpoint systems requiring repairs. An example of this type of ordinance is available on the [Center for Watershed Protection](#) Web site in the illicit discharge category.

Perhaps the biggest limitation to correcting failing septic systems is the lack of techniques for detecting individual failed systems. While visual inspections and dye testing can locate a malfunctioning system, they require access to private property and demand staff time. Dealing with failing septic systems requires a stronger emphasis on developing screening techniques that local governments can use to detect and correct improperly operating systems. Water quality sampling at MS4 outfalls for wastewater indicators (e.g., bacteria, nutrients, optical brighteners) can be a good indicator of failing septic systems in a particular area.

Cost Considerations

The costs of detecting and correcting septic system failures are subject to several factors, including the type of screening, availability of trained personnel, cost of materials and the level of follow-up necessary to fix system problems. For routine inspections of single homes by a qualified professional, costs generally range from \$250 to \$500 per inspection (U.S. EPA, 2017). Community-wide screening or field sampling campaigns are more expensive and depend on the type of screening and scale of implementation. One technique to reduce costs is to conduct MS4 outfall screening for wastewater indicators, which can be relatively cheap, and allows for the targeting of sub-watersheds and more resource-intensive individual septic system inspections.

Once a community identifies a failing septic system, it should secure procedures and funding to replace it. The

Common Field Tests

Below are common field tests that county health departments or other authorized personnel can conduct:

- **Visual and olfactory screening.** Odors, surface pooling and isolated patches of green grass sprouting out of season are common indicators of a failing septic system.
- **Bacterial or chemical indicators.** High concentrations of bacterial or chemical indicators in nearby drainage systems or waterways can be effective, rapid means of identifying failing septic systems. Fecal indicator bacteria can identify severe septic failures (Ahmed et al., 2005), while compounds commonly in domestic wastewater, such as caffeine and sucralose, can pinpoint individual sources of contamination (Lange et al., 2012; Lim et al., 2017; Schaidt et al., 2017).
- **The brightener test.** This test uses ultraviolet light to screen for the fluorescence of the optical brighteners in detergents and toilet papers.
- **Color infrared aerial photography.** This test uses variations in vegetative growth or stress patterns over septic system field lines to identify potentially malfunctioning systems.

Following analysis of any of the above tests, a detailed on-site visual and physical inspection can confirm if the system has failed and determine the extent of the repairs necessary.

cost of replacing a septic system varies widely across the country, but it is typically at least several thousand dollars, depending on site conditions and geographic location. More advanced treatment systems are generally more expensive. Various methods have financed septic system replacement, including money from state revolving funds or from local utilities through user fees. EPA's Web page on [funding for septic systems](#) contains more information on funding sources.

When considering the cost of septic system remediation or replacement, one should compare the long-term costs and benefits of in-kind replacement to the costs and benefits of connecting to local sanitary sewer networks. Some states and municipalities provide incentives to remove septic tanks and connect to the local sanitary sewer system, even without demonstrated septic system failure.

Additional Information

Additional information on related practices and the Phase II MS4 program can be found at EPA's National Menu of Best Management Practices (BMPs) for Stormwater website

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Disclaimer

This fact sheet is intended to be used for informational purposes only. These examples and references are not intended to be comprehensive and do not preclude the use of other technically sound practices. State or local requirements may apply.

EXHIBIT D



SOUTH CAROLINA

NONPOINT SOURCE MANAGEMENT PLAN

2020 - 2024

South Carolina Department of Health and Environmental Control



Prepared by:

SC Department of Health and Environmental Control
Bureau of Water
Watersheds and 319 Section

Acknowledgements:

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SC Department of Health and Environmental Control
Bureau of Water
2600 Bull Street
Columbia, SC 29201

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I. INTRODUCTION

The 2020-2024 South Carolina Nonpoint Source Management Plan (Plan) describes the State's Nonpoint Source Management Program, which is focused on protecting high quality waters from nonpoint source (NPS) threats and restoring waters impaired by NPS pollution. The South Carolina Department of Health and Environmental Control (DHEC) expects this Plan to be both useful and informative. The Plan will serve as a tool for positive change in protecting and improving water quality, as it provides a framework for addressing the major causes and sources of nonpoint source pollution in the state. It outlines the state's goals and objectives for mitigating nonpoint source pollution and the strategies, management measures, partnerships, funding sources, and evaluation tools necessary to achieve those goals.

A. NONPOINT SOURCE POLLUTION

Nonpoint source pollution occurs when rainfall or irrigation runs over land or percolates through the ground, picking up pollutants and carrying them into rivers, lakes, coastal waters, and ground waters. Unlike point source pollution, which can be traced to a defined source, nonpoint source pollution is diffuse, making it difficult to identify and control its source.

Nonpoint sources of pollution are important to control because they are continuously recognized as the nation's largest cause of surface water quality impairments. NPS pollution may contain bacteria and nutrients from malfunctioning septic systems or animal waste, eroded soil from land disturbances, nutrients and pesticides from agricultural or urban areas, air pollutants from atmospheric deposition, and heavy metals and other toxins bound to soil particles. These pollutants can impact human and aquatic health, effect aquatic and marine habitat, and make drinking water more difficult to treat.

B. HISTORY OF SC'S NONPOINT SOURCE MANAGEMENT PROGRAM

Recognizing the growing problem of NPS pollution, in 1987, Congress added nonpoint source provisions to the Clean Water Act (CWA) under Section 319. Among other provisions, Section 319 requires each state to develop and maintain a Nonpoint Source Management Program to comprehensively address nonpoint sources of pollution. Contingent on EPA's approval of the State's NPS Management Plan, Section 319 also provides grants to states for implementing NPS best management practices (BMPs).

The Nonpoint Source Management Plan has been prepared in accordance with Federal and State regulations and was originally approved by EPA in 1990. DHEC has statutory authority to enforce the Nonpoint Source Management Program provisions of 33 U.S. Code § 1329 through the SC Pollution Control Act, S.C. Code Ann. § 48-1-10, and the regulations and permitting programs promulgated pursuant to the Pollution Control Act. Additionally, the South Carolina Coastal Zone Management Act of 1977, S.C. Code Ann. § 48-39-10, provides additional authority in the coastal counties of the State. South Carolina received full coastal program approval by EPA in 2008. Since the original South Carolina NPS Program was developed, the Nonpoint Source Management Plan has been updated twice. This Plan is an update to the 2015-2019 NPS Management Plan, reflecting improvements in many of South Carolina's NPS Management Program activities and a refocus of the Program's goals.

II. NONPOINT SOURCE PROGRAM MISSION AND GOALS

MISSION

The South Carolina Nonpoint Source Program will protect high quality waters from NPS threats and restore waters impaired by NPS pollution.

GOALS:

1. **Restoration of SC Waters** – to restore waterbodies that are impaired by nonpoint sources so that they meet water quality standards
2. **Protection of SC Waters** – to prevent nonpoint source-related impairments of unimpaired waterbodies

DHEC has established five guiding principles to help implement strategies to achieve NPS Management Program goals and objectives for this Plan period. In order to quantitatively measure progress towards DHEC's long-term goals, objectives with measurable milestones have been

developed that further define the direction and activities related to achieving the intent of each goal. Program objectives and milestones are found in Section IX, along with each corresponding year for implementation, as well as related goals, principles, and key partners.



III. PROGRAM MANAGEMENT

Section 319 of the Clean Water Act (CWA) outlines two major programs to address nonpoint sources of pollution, a management program and a grant program, both of which require significant administrative oversight by states to implement. Each year, states receive funding appropriated under Section 319(h) of the Clean Water Act to implement these programs. The funds are an important resource for restoring and protecting waterbodies, particularly in South Carolina where there are few other resources for this purpose. EPA guidelines require at least 50 percent of funds to be set aside for watershed implementation projects through the grant program. The remaining NPS Program funds are used to support the full array of program management activities outlined in this Management Plan including planning, technical assistance, enforcement, and monitoring.

South Carolina's Nonpoint Source Coordinator has the primary responsibility of implementing and tracking implementation of both the Management Program and the Grant Program. Activities are reported to EPA each December in the NPS Annual Report and regularly in EPA's Grants Reporting and Tracking System (GRTS). Program implementation via DHEC staff is also tracked through annual reporting, analysis of staff time, and regular communication with applicable staff.

Close coordination with a variety of DHEC programs such as coastal nonpoint source, agriculture permitting, stormwater, Total Maximum Daily Loads (TMDLs), State Revolving Funds (SRF), wetlands protection, and onsite wastewater is essential. NPS staff actively work with other program areas to align priorities and promote additional efficiencies where possible. Outside of DHEC, the NPS Program partners with EPA, SC Forestry Commission, USDA Natural Resources Conservation Service, SC Department of Natural Resources, Clemson University, local governments, nonprofits, and many other organizations with nonpoint source ties. While South Carolina currently enjoys a number of close partnerships, it is a continuous goal to develop and strengthen partnerships to increase collaborative efforts as a means of addressing state NPS pollution.

The NPS Management Plan must evolve over time as funding and water quality priorities change. To have an effective and efficient program, it is critical for program planning and updating to occur regularly. DHEC will review the objectives and milestones in this Plan as part of the annual application process and will update the entire Management Plan no less than every five years.

IV. ASSESSMENT AND PLANNING

DHEC is responsible for assigning designated uses to South Carolina waterbodies and establishing rules to protect those uses. The Department regularly assesses water quality to determine if waterbodies are meeting standards. Assessments result in an overview of the status of South Carolina's waterbodies for Clean Water Act reporting, provide data for determining whether waterbodies should be listed as impaired, and support the development of Total Maximum Daily Loads (TMDLs) and watershed-based plans to correct water quality problems.

A. WATER QUALITY STANDARDS

[Water quality standards](#) serve as the basis for protecting and regulating the quality of South Carolina's waters. They define the goals for a waterbody by designating its uses, setting criteria to protect those designated uses, and establishing an antidegradation policy to protect and maintain existing uses and high-quality waters.

B. STATEWIDE ASSESSMENT

Every two years, DHEC is required by the Clean Water Act to assess and report on the overall condition of the State's waters. The [SC 305\(b\) and 303\(d\) Integrated Report](#) presents a general statewide assessment of water quality conditions and water pollution control programs in South Carolina.

C. IMPAIRED WATERS

303(d)

For those surface waters that do not meet water quality standards, Section 303(d) of the CWA requires all states to place those waterbodies on a comprehensive [list of impaired waters](#), also known as the 303(d) list. The purpose of the list is to identify impaired waters so that the source of impairment can be described and corrective actions can be implemented to improve water quality.

Once a site is included on the 303(d) list of impaired waters, a Total Maximum Daily Load (TMDL) must be developed. The goal of a TMDL is to identify potential pollution sources and calculate and quantify the reduction of those sources in order to meet water quality standards. After the approval of the TMDL, an implementation plan can be developed and implemented to reduce sources of pollution within a watershed and restore the full use of the waterbody.

Results from the most recent assessment and [303\(d\) list provided to EPA in 2016](#), along with results on the [2018 Draft 303\(d\) list](#), are summarized in **Tables 1 and 2**. The results are shown for all fresh and salt waters combined.

Table 1. Impairments by Category on the SC 2016 303(d) List

Category	Total Impairments	Streams	Lakes	Estuaries	Shellfish Waters	Beaches
Bacteria	310	149	3	54	87	17
Nutrients, pH, and DO	184		184			
Fish tissue, Hg, and PCBs	177	177				
Macroinvertebrates	176	176				
Dissolved Oxygen	134	104		30		
Turbidity	83	15	12	56		
pH	43	38		5		
Metals	38	25	4	9		
Ammonia Toxicity	6	3	2	1		

Table 2. Impairments by Category on the SC Draft 2018 303(d) List

Category	Total Impairments	Streams	Lakes	Estuaries	Shellfish Waters	Beaches
Bacteria	362	167	5	60	116	14
Nutrients, pH, and DO	197		197			
Fish tissue, Hg, and PCBs	190	190				
Macroinvertebrates	173	173				
Dissolved Oxygen	142	108		34		
Turbidity	92	16	13	63		
pH	45	40		5		
Metals	36	23	4	9		
Ammonia Toxicity	5	3	1	1		

Both the 2016 and Draft 2018 303(d) lists reflect a similar trend in terms of relative category size of impaired sites, and the following description of the data accurately discusses both lists. In terms of number of sites impaired, bacteria continue to be the largest category of impaired sites in South Carolina. The next largest category is nutrients and nutrient-related parameters, which are all lake sites. Currently, SC has only established numeric nutrient criteria for lakes larger than 40 acres, so other waters are not assessed for nutrients. Nutrient enrichment in lakes may cause variations in pH, dissolved oxygen, and may lead to excessive and undesirable phytoplankton growth. For the purpose of comparing categories of impairments, lake pH and dissolved oxygen impairments are combined with total phosphorus, total nitrogen, and chlorophyll a to give a total number of lake impairments potentially linked to nutrients.

Fish tissue mercury and PCBs also rank high based on the number of impaired sites in South Carolina; however, 319 program approaches are not viewed as the solution to these problems, so they are not currently considered Nonpoint Source Program priorities.

Many sites in South Carolina are also listed as impaired due to a poor benthic macroinvertebrate community. In most cases the specific cause is not determined. More information is needed about the causes of impairment and appropriate solutions before broadly targeting 319 implementation projects in this direction. However, the 319-grant program will seek to address impaired benthic communities where sufficient information allows development of watershed-based plans and identification of appropriate BMPs. Many 319 grants target additional water quality impairments and, through the selected BMPs, also end up addressing impaired benthic communities.

305(b)

The statewide statistical survey component of the South Carolina ambient monitoring program is designed to make statewide estimates of water quality. The data derived from those monitoring activities is used to develop the stream, lake, and estuarine summary information presented in the [2016 SC Integrated Report](#) and can also be found in **Tables 3-5** of this Plan. Once the 2018 SC Integrated Report is finalized and approved by EPA, this Management Plan will be updated to include this more recent information.

Based on the modified USEPA National Hydrography Dataset and the results of survey site selection validation, South Carolina has an estimated 26,259 miles of freshwater rivers and streams representing the stream sampling design frame, and 393,430 acres of lake and reservoir representing the lake/reservoir sampling design frame. Based on a hydrographic GIS cover developed jointly by SCDHEC and the South Carolina Department of Natural Resources and the results of survey site selection validation, South Carolina has an estimated 289 combined square miles of tidal creek and open water habitat representing the estuarine sampling design frame.

Quality assured water quality data collected as part of the survey network from 2010 through 2014 provided the database for this assessment. The tables in the [2016 305\(b\) report](#) include the cause of use support nonattainment affecting the largest size in each waterbody type for aquatic life and primary contact recreation uses. These results are summarized in **Tables 3, 4, and 5** below for rivers and streams, lakes, and estuaries, respectively.

Table 3. Total Size of Rivers and Streams Impaired by Various Cause Categories in 2016 305(b) Report

Cause Category	Survey-Based Estimated Miles of Total Resource*	Lower 95 Percent Confidence Interval (Miles)	Upper 95 Percent Confidence Interval (Miles)
<i>E. coli</i>	17,550	14,878	20,223
Dissolved Oxygen	1,900	756	3,044
pH	426	0	1,102
Turbidity	95	0	251
Ammonia	95	0	263
Macroinvertebrate Community	32	0	87

*26,259 miles est.

Table 4. Total Size of Lakes Impaired by Various Cause Categories in 2016 305(b) Report

Cause Category	Survey-Based Estimated Acres of Total Resource*	Lower 95 Percent Confidence Interval (Acres)	Upper 95 Percent Confidence Interval (Acres)
Total Phosphorus	63,300	42,344	84,256
pH	25,147	12,052	38,243
Dissolved Oxygen	10,432	0	21,692
Chlorophyll a	9,998	0	20,337
Total Nitrogen	8,161	987	15,334
Ammonia	5,062	0	13,747
<i>E. coli</i>	3,762	0	7,711
Turbidity	2,794	0	7,563

*393,430 acres est.

Table 5. Total Size of Estuaries Impaired by Various Cause Categories in 2016 305(b) Report

Cause Category	Survey-Based Estimated Square Miles of Total Resource*	Lower 95 Percent Confidence Interval (Square Miles)	Upper 95 Percent Confidence Interval (Square Miles)
Turbidity	34.5	23.0	46.1
Dissolved Oxygen	14.1	3.9	24.4
Enterococci	12.7	4.9	20.5

*289 square miles est.

South Carolina's 2016 305(b) report to EPA identifies bacteria as the most prevalent cause of non-attainment in the state's streams and rivers when calculated based on affected river miles. The 2016 305(b) report classifies nutrients and nutrient-related parameters as the major cause of non-attainment in the state's lakes based on affected acres. Turbidity is the main causes of impairment in estuaries.

SC Integrated Report

Based on the causes of impairment in the South Carolina 303(d) list of impaired waters and the results of DHEC's statistical survey sampling documented in the 305(b) report, bacteria and nutrients (including related parameters) continue to be the most widespread problems facing South Carolina waters. Nonpoint sources are significant contributors of bacteria and nutrients, and these pollutants will continue to be the main parameters of concern for DHEC's Nonpoint Source Program.

D. WATERSHED PRIORITIZATION

The watersheds discussed below represent DHEC's priority watersheds (**Figure 1**). DHEC will continue to use bonus points in the watershed-based plan and 319-project selection process for proposals located in these watersheds.

DHEC Watersheds and 319 Priority Watersheds

DHEC and EPA Region 4 established nine priority watersheds across the state. These watersheds were identified by DHEC, EPA, and 319 project partners based on water quality, other state and federal priorities, and local interest. Bonus points are awarded to any project proposals including these watersheds to ensure priority in DHEC funding mechanisms directed to these watersheds. These include the following Hydrologic Unit Codes (HUCs):

- 03050109 (Saluda)
- 03060106 (Middle Savannah)
- 03050206 (Edisto)
- 030601100301 (May River)
- 030502080606 (Okatie River)
- 0304020106, 0304020107 (Black Creek)
- 030502090201, 030502090202 (Sewee-Santee)
- 03060103 (Upper Savannah)
- 03060109 (Lower Savannah)

USDA NRCS NWQI Priority Watersheds

The Nonpoint Source Management Program coordinates with USDA's Natural Resources Conservation Service (NRCS), to select 12-digit watersheds for the National Water Quality Initiative (NWQI). These watersheds are receiving additional attention by NRCS for installation of agricultural BMPs and have been

prioritized by DHEC for ongoing ambient water quality monitoring to document watershed response. These watersheds are selected on a yearly basis. Watersheds are first selected for the Readiness Phase, during which an assessment is done. Once readiness assessments are completed for the watershed, this will inform implementation in the next fiscal year and beyond.

FY20 brought about several updates to the requirements for NWQI and onward, including:

- Assessment to guide implementation of conservation practices at the HUC-12 level, including those within a Source Water Protection Area
- Identification and mapping of critical source areas for identified pollutants
- Water quality improvement goals and methods to track progress toward them
- Outreach strategies for implementation on vulnerable areas

Also beginning in FY20, all NWQI watersheds (new or existing) must have a watershed-based plan or assessment that informs implementation. This provides greater opportunity for collaboration between the 319 Program and NRCS.

The NWQI watersheds identified in FY19 (**Figure 1**) are:

- NWQI Readiness Watersheds for Assessment:
 - 030501091103 (Big Creek-Little Saluda River)
 - 030402011102 (Smith Swamp)
- NWQI Implementation Watersheds
 - 030501091104 (Upper Little Saluda)



Figure 1. South Carolina's Priority Watersheds for 2020

V. PLAN IMPLEMENTATION

South Carolina uses a combination of statewide programs and on-the-ground projects to address significant nonpoint sources of water quality pollution, such as agriculture, development, urban, forestry, coastal activities, and mining. Programmatically, the state supports a variety of voluntary and regulatory programs and partnerships to improve water quality. Not all of the following programs receive 319 funding or count toward non-federal match requirements, but they all directly impact potential sources of NPS pollution and are thus considered to be key elements in South Carolina's overall NPS pollution reduction effort. At the project level, DHEC works to address NPS priorities through specific watershed improvement efforts, which are the primary focus of 319-funded projects and activities.

A. WATERSHED MANAGEMENT

As seen in **Figure 2**, DHEC divides South Carolina into eight major river basins: Broad, Catawba, Edisto, Pee Dee, Salkehatchie, Saluda, Santee, and Savannah. Together, these river basins contain over 26,000 miles of stream, 393,000 acres of lake, and 280 acres of estuary. These eight basins are broken into 12-digit Hydrologic Unit Codes (HUCs). EPA requires the use of watershed-based plans (WBPs) for 319 implementation projects and has issued specific guidelines regarding nine required elements that must be included in those plans. In order to focus efforts and most effectively target stakeholders during the project, SC's Nonpoint Management Program looks at watersheds based on 12-digit HUCs. Specifically, both WBP development and 319 project solicitations specify that proposals should have a limited watershed size to provide a workable focus area during the limited project time. Most accepted proposals cover a reasonable geographic scope of one to four 12-digit HUCs.

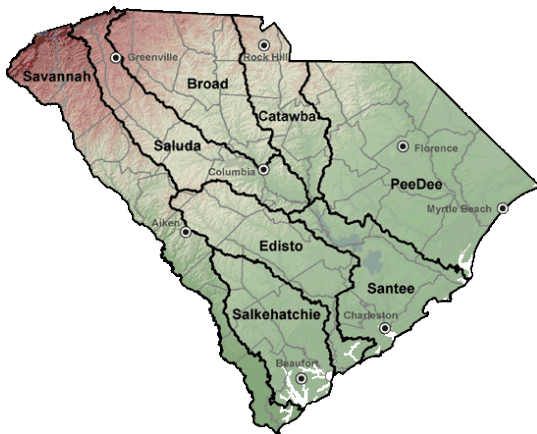


Figure 2. South Carolina's Eight Major Watersheds

DHEC has developed a suite of tools to assist stakeholders in the creation and implementation of watershed-based plans.

South Carolina's watershed approach takes a holistic view of nonpoint source pollution, addressing all sources within a watershed using complementary practices. The NPS Program continues to look for ways to coordinate and target resources from multiple program areas in watersheds with NPS problems, helping to ensure that maximum water quality benefits are achieved.

Each major basin in South Carolina has a Watershed Manager that supports watershed-based planning and water quality improvement projects to protect and restore waterbodies. Watershed Managers work closely with community stakeholders to develop and implement plans to address nonpoint sources of pollution. Successful development and implementation of WBPs depend upon the involvement and support of local stakeholders. Watershed Managers work with DHEC staff, local governments, other state agencies, academia, conservation organizations, landowners, and citizens in addressing chronic NPS

problems throughout the state through appropriate use of BMPs. Watershed Managers also provide technical assistance in the identification, assessment, and long-term management of NPS pollution problems affecting waters of the state, primarily through the 319-grant process.

B. 319 NONPOINT SOURCE GRANT PROGRAM

South Carolina receives an annual grant allocation from EPA to implement the NPS reduction strategies described in this Plan. A portion of these funds, the Watershed Project funds, are passed on through a competitive grant process to eligible organizations to conduct projects identified in approved watershed-based plans to reduce or prevent NPS pollution. Grant proposals for NPS projects are solicited annually. Projects are selected using a competitive proposal process. A Request for Proposals (RFP) is released at least once per year along with an initial proposal application. Applicants must follow specific guidelines to develop a proposal, which are published on the DHEC website and included in the RFP and initial proposal application. The proposed project must implement all or a portion of a watershed-based plan and include at least a 40 percent match, as Section 319 requires federal funds to be matched by 40 percent non-federal funds. Match includes cash and in-kind services used for NPS activities if they are not sustained by another federal source.

As of FY19, Letters of Assurance are required for projects proposed in MS4s to ensure that all activities and load reductions brought about by 319 funds are not counted toward NPDES requirements. Proposed projects are also reviewed by MS4 staff to ensure that all proposed BMPs go “above and beyond” NPDES permit requirements.

Initial proposals deemed eligible are then requested to submit a final application, which is reviewed by an intra-agency committee of professionals from various DHEC Bureau of Water programs, including a coastal NPS representative. The committee meets to discuss the applications and selects which projects will be funded, stipulating any needed changes or conditions. Following committee selection, applicants must make requested changes. DHEC reviews these changes and forwards the finalized workplans to EPA Region 4 for review and final approval. Once this has been completed, DHEC will then issue a grant agreement and purchase order for each project.

It is worth noting that project selection in South Carolina occurs after the annual award from EPA has been received. This allows stakeholders to apply for and receive funding relatively quickly, which helps keep momentum in a watershed. Other states engage in a selection process prior to their initial grant application to EPA. As there is a delay between initial application to EPA and receipt of final award, this would mean that applicants may wait well over one year between applying for funding and award of a contract. This is not practical in South Carolina and, as such, DHEC will continue to utilize a placeholder project in the annual workplan for issuance of these projects. EPA approves each project workplan prior to funding. Further information about 319 grants and the application process can be found on the [Watersheds and 319 webpage](#). Details on 319 grant-funded projects can be found in South Carolina’s NPS Annual Reports.

Project implementation typically takes three years. Throughout this period, DHEC staff closely monitor both the project work and expenditures, working with grantees to ensure funds are spent in a timely manner. Should grantees be unable to spend all awarded funding, NPS staff will reassign that funding to another project with EPA’s guidance. This strategy also assists in limiting unliquidated obligations (ULOs)

and large balances at the end of a grant period. Beyond limiting ULOs, DHEC staff closely track expenditures of all grant funds. Grantees submit invoices no less than quarterly and provide full backup documentation of their expenditures. Grantees are also subject to quarterly reporting and at least one site visit a year. Reports include documentation of BMPs installed and progress towards defined milestones. All grant recipients are provided custom electronic reporting workbooks to streamline reporting and ensure consistency. Watershed Managers and NPS staff regularly communicate with all grant recipients and assist as needed. Further, as DHEC provides water quality monitoring for all watershed projects, NPS staff must also routinely examine the collected data to evaluate success and/or assist in directing grantees to where further work is needed.

Information on all 319-funded projects is uploaded to the Grants Reporting and Tracking System (GRTS). As of FY19, information is uploaded quarterly with grantee quarterly reporting, rather than annually, as was done previously. This includes details on project objectives and funding levels, as well as BMPs installed and estimated pollutant load reductions, as applicable. Project progress is also included in an Annual Report each December to document progress towards meeting the goals of the NPS Management Plan.

As the overall goal of the entire NPS Program is water quality improvement, perhaps the most valuable reporting tool is the documentation of project Success Stories. DHEC analyzes water quality data collected for watershed projects to determine if any water quality improvements have occurred. This information is then compiled with project details to generate an article to be posted on the [EPA Success Story website](#). South Carolina generates stories for both full restoration where water quality standards have been attained and for partial restoration, where standards are not attained, but significant improvement has been made.

C. COASTAL NONPOINT SOURCE PROGRAM

The Coastal Nonpoint Program (CNP) is an extension of the statewide Nonpoint Source Management Program (319 Program) that fosters coordinated research, outreach, and management activities to enhance state and local efforts to manage NPS pollution affecting South Carolina's eight coastal zone counties. DHEC received full approval of the CNP in 2008.

DHEC's Office of Ocean and Coastal Resource Management (DHEC OCRM) works to mitigate the impact of NPS pollution from development in coastal areas through planning, permitting, and enforcement activities. DHEC OCRM staff also work with the NPS Program by serving on the Section 319 grant proposal review committee to rank and award funding for proposals and, when available, attending project kick-off meetings and site visits for coastal projects.

The Adopt-A-Beach program is part of the DHEC OCRM Marine Debris Initiative. Adopt-A-Beach volunteer groups participate in beach cleanups, remove debris from SC beaches and coastal waterways, and provide marine debris collection data to DHEC OCRM. Currently, 236 [MyCoast](#) members have used or are using the Beach Cleanup reporting tool, and DHEC OCRM has logged over 800 cleanups since the app was launched in April 2016.

In partnership with SCDNR, SC SeaGrant, and the SC Marine Association, DHEC OCRM staff participate in the SC Clean Marina Program, part of an effort to use best management practices to protect and improve

water quality at marinas. The program provides a unique opportunity for marina owners and operators to protect water quality and to be recognized for their efforts by meeting prescribed environmental performance criteria.

D. REGIONAL NONPOINT SOURCE RESPONSE

Due to increased population growth and drastic changes in land usage, acute nonpoint source incidents are increasing in both frequency and potential water quality impacts. DHEC's regional staff investigate nonpoint source-related complaints, including problems from silviculture, agriculture, stormwater, and runoff from construction sites.

Personnel attempt to prevent any further impact and work toward mitigation of offsite impacts with the responsible party and other interested entities. Uncooperative or recalcitrant parties are referred to DHEC's Bureau of Water Enforcement Section for violations of the Pollution Control Act and the State's Antidegradation Regulations.

E. CHAMPIONS OF THE ENVIRONMENT

Champions of the Environment is an annual grant award program that provides funding to South Carolina K-12 students and teachers to implement environmental action and awareness projects in their school and community. The program reaches hundreds of school-aged children, educators, and members of the general public while promoting the grant program and NPS issues. Champions of the Environment is supported by a public-private partnership including local businesses and the Environmental Education Association of South Carolina.

F. ADOPT A STREAM

South Carolina Adopt-a-Stream is a volunteer citizen water quality monitoring program that provides the opportunity to be directly involved in the protection and improved management of our watersheds. Volunteer monitors provide vital baseline data that helps determine the health of South Carolina waterways. In sharing this information on the local level, partnerships are formed that can lead to greater protection and restoration of the State's waters. SC Adopt-a-Stream-trained volunteers increase awareness within their communities and encourage others to join in watershed stewardship.

G. SC WATERSHED ATLAS

Historically, SCDHEC's Watersheds and 319 Program shared extensive water quality information through published Watershed Water Quality Assessments. The assessments have been replaced by the [SC Watershed Atlas](#).

The SC Watershed Atlas brings the Agency's most current and comprehensive watershed and water quality information into a user-friendly, statewide application. This searchable atlas includes watershed boundaries and descriptions; 319 projects, WBPs, and Success Stories; Bureau of Water permits and

advisories; public water supply; water quality monitoring stations and assessments; water classifications; floodplains; National Wetland Inventory; National Land Cover Data; Municipal Separate Storm Sewers (MS4s); TMDLs; and more. A selection of basemaps, measuring and drawing tools, map-making and printing capabilities, and an instructive help section are also available.

General maintenance of the SC Watershed Atlas is designed to be as self-sustaining as possible. Typically, Bureau of Water program layers on the Atlas are updated by program area staff in GIS, working with IT's GIS staff as needed. However, the Atlas is primarily sustained by the GIS staff of SCDHEC's IT section. FY19 brought about a complete overhaul of the SC Watershed Atlas, making it more comprehensive and user-friendly. This update also provided a separate section for nonpoint-source-related information, making it much easier for users to access.

H. ADVISORY PROGRAMS

Freshwater Swimming Advisories

The Watershed Program educates citizens about current nonpoint source health risk advisories, how they can reduce their NPS contributions, and encourages adherence to advisory guidelines. A website, outreach materials, and 1-800 information line increase awareness of health risks associated with swimming in impaired waters. They are also used as a springboard for increasing awareness of NPS issues and steps citizens can take to reduce their contributions to runoff pollution. Staff work with Central and Regional DHEC offices to address concerns from the public about these advisories.

Saltwater Swimming Advisories

In addition to freshwater swimming advisories, DHEC staff issue advisories for coastal waters from May through October to inform recreational users about potential bacteria risks from NPS pollution. DHEC routinely collects water samples at over 120 locations on SC beaches in accordance with federal standards. Advisories may be issued due to high bacteria counts or rainfall. DHEC uses multiple outlets to advertise advisory information including newspapers and television at affected beaches.

Fish Consumption Advisories

DHEC collaborates with the South Carolina Department of Natural Resources (DNR) to educate citizens about the potential risks of eating fish due to mercury and PCB contamination. DHEC collects and tests a variety of fish from South Carolina lakes, rivers, streams, estuaries, and offshore waters and issues recommendations about which types of fish are safe and how much fish is safe to eat from each waterbody. Advisory information is communicated to the public and at-risk groups via a comprehensive website and, when funding is available, booklets and brochures.

Fish Advisories are one component of DHEC's broader Mercury Assessment and Reduction Initiative, which identifies ways that the public, industry, interested groups, and the government can collectively monitor, assess, and address mercury in the environment and reduce mercury exposure.

I. STATE REVOLVING FUND

The State Revolving Fund (SRF) program provides low-interest rate loans for building or repair to wastewater and drinking water systems and stormwater quality improvement projects. Through the

Clean Water State Revolving Fund (CWSRF), a wide array of water quality improvement projects may be funded, including green infrastructure projects, stormwater management controls, and nonpoint source reduction projects. Nonpoint source projects receive a lower interest rate to incentivize the use of this substantial funding resource.

The CWA requires that states develop a comprehensive list of potential projects eligible for funding from the CWSRF and rank them in priority order. Multiple DHEC programs provide input into the CWSRF ranking system, including the Nonpoint Source Program. To combine resources to improve water quality, proposed CWSRF projects complementing a water quality improvement effort that has received 319 funding are awarded additional points in the ranking system, making such projects a higher priority for SRF funding.

In 2019, the Nonpoint Source Program and the SRF Program collaborated to create a 319 Nonpoint Source and Clean Water State Revolving Fund Joint Funding Opportunities fact sheet. This will be utilized as a guide and appendix for 319 RFPs going forward to increase projects addressing NPS pollution by public entities and create a more concerted effort among SCDHEC's own programs. It is linked and mentioned on the [Watersheds and 319 webpage](#).

DHEC also sets aside a small percentage of the Drinking Water State Revolving Fund (DWSRF) capitalization grant, usually around \$100,000 for the development of watershed-based plans (WBPs) for watersheds that have Source Water Protection Areas (SWPAs). A request for proposals is issued in September for the development of watershed-based plans as mandated by the EPA's watershed-based plans development guidance document. The plans address ambient surface water pollutants and their impacts on surface water bodies that are also drinking water sources. Proposals are accepted from SRF-eligible borrowers, watershed organizations, soil and water conservation districts, regional planning commissions, and public universities. All DHEC-funded WBPs contain EPA's nine required elements.

J. STORMWATER

Stormwater runoff from construction activities, industrial operations, and storm sewer systems in urbanized areas has the potential to accumulate pollutants as it crosses the landscape. Most of these are considered point sources and must comply with both federal and state regulations to ensure that polluted stormwater does not have an adverse effect on the State's waters.

DHEC implements and enforces numerous laws, regulations, and policies to limit and control adverse impacts of stormwater. The federal National Pollutant Discharge Elimination System (NPDES) program is the primary driver for most state and federal stormwater regulations. Under the NPDES Permit Program, stormwater discharges are labeled as point pollution sources, and operators of these sources may be required to obtain an NPDES permit before they can discharge. More information on specific permitting activities for construction, industrial activities, and municipal separate storm sewer systems (MS4s) can be found on [DHEC's Stormwater webpages](#).

Most stormwater regulations can be met by implementing site-specific structural and non-structural best management practices (BMPs) and/or through municipal pollution prevention programs. The South Carolina Department of Transportation also maintains standard technical specifications for sediment and erosion control practices for roads and highways.

K. ONSITE WASTEWATER

[According to the EPA](#), about 40 percent of homes in South Carolina rely on septic systems to treat their wastewater. In an average year, 10 to 30 percent of septic systems fail to work properly, usually because of poor maintenance.

Improperly functioning septic systems can be a significant source of NPS pollution, particularly in rural areas. Because incorrectly installed septic tanks can harm water quality and cause human illness, SC law requires site approvals and permits for all septic systems for new construction. South Carolina also requires septic tank professionals to obtain a license before installing or pumping out septic tanks.

DHEC staff provide technical assistance to landowners regarding proper installation and maintenance of septic systems to help alleviate or correct water quality problems. Staff also work closely with 319 projects where failing septic systems are contributing to NPS pollution problems. The 319 program refers low-income, rural homeowners outside of 319 project areas to USDA Rural Development's Section 504 Home Repair program for assistance with septic system repairs or replacement. These funds enable homeowners to afford the service, increasing the number of systems that can be repaired in each watershed. Every repaired system improves not only the quality of life for the homeowner, but also the quality of water for everyone in the watershed. South Carolina's 319 grantees include fixing and replacing malfunctioning septic tanks in their watershed-based plans, and many 319 projects focus on this.

L. AGRICULTURE

Agricultural Permitting

State Law and Regulations require owners and operators of most animal feeding operations (AFOs) to obtain permits for the handling, storage, treatment (if necessary), and disposal of manure, litter, and dead animals generated at their facilities. In addition to the state permit, AFOs are required to have a National Pollutant Discharge Elimination System (NPDES) permit if they have a discharge to surface water. Other agricultural activities such as peach packing, stock yards, slaughter houses, and meat markets may also be required to have agricultural permits depending upon their specific situation.

Owners of agricultural facilities are assisted by DHEC in achieving and maintaining compliance with their permits. Enforcement actions are taken, when necessary, to attain compliance with permits, water quality standards, and state laws and regulations.

Under the Clean Water Act, stormwater discharge from irrigated agriculture is considered NPS pollution. Thus, many of South Carolina's 319 grantees include agricultural BMPs in their watershed-based plans, and many 319 projects incorporate this in their chosen water quality improvement activities.

USDA Natural Resources Conservation Service

USDA's Natural Resources Conservation Service (NRCS) provides financial and voluntary technical assistance to eligible landowners and agricultural producers to help sustainably manage natural resources. In particular, the Environmental Quality Incentives Program (EQIP) provides technical and financial assistance, at a 75 percent cost-share rate, to farmers to install or implement structural and management conservation practices that can improve water quality. While EQIP is administered by the USDA-NRCS, State priorities are established with input from a State Technical Committee (STC) which is

comprised of representatives from federal and state conservation agencies, including DHEC Nonpoint Source Program staff, agricultural producers, nonprofit organizations, and agribusiness.

In addition to statewide collaboration, county NRCS staff provide technical assistance for 319 projects. 319-funded projects also leverage EQIP funds to provide additional financial assistance and incentive to farmers and landowners installing management practices that reduce nonpoint source pollution.

M. PESTICIDES

DHEC Pesticide Permitting

Application of pesticides to surface waters of the State requires a permit under the federal Clean Water Act. DHEC issued a general permit to allow owners and operators to have a means to carry out important activities to control unwanted pests and vegetation and comply with the Clean Water Act and State rules. While some of the State's surface waters can be dry during dry times of the year, a discharge to those areas still requires a permit to legally allow the activity.

Clemson University Pesticide Regulation

Clemson University's Department of Pesticide Regulation promotes the safe and proper use of pesticides. The Department of Pesticide Regulation is the enforcement and investigative authority in South Carolina for pesticide use and alleged misuse in accordance with state and federal laws and regulations. Clemson's programs include applicator licensing and education, pesticide container recycling, integrated pest management in schools, endangered species protection, and the worker protection program.

N. WETLANDS

CWA Section 404

Under CWA Section 404, a permit is required for the discharge of dredged or fill material into waters of the United States. The US Army Corps of Engineers (USACE) evaluates permit applications for construction activities that occur in the nation's waters, including wetlands.

CWA Section 401

CWA Section 401 requires that the State issue certification for any activity which requires a federal permit or license and may result in a discharge to waters of the State such as permits issued by the USACE. US Coast Guard Permits and Federal Energy Regulatory Commission licenses also require states to take water quality certification action. During review of applications for water quality certification, DHEC assesses a project's water quality impacts and ensures that the appropriate mitigation sequence of avoidance, minimization, and compensation has been followed. Certification is denied if the activity permanently alters the aquatic ecosystem in the vicinity of the project such that its functions and values are eliminated or impaired. The federal permit cannot be issued if certification is denied. Certification is often conditioned upon the successful completion of compensatory mitigation, the last step in the mitigation sequence. All 401 permits are issued with at least the following standard construction site BMP condition: The applicant must implement appropriate best management practices that will minimize erosion and migration of sediments on and off the project site during and after construction. These practices should include the use of appropriate grading and sloping techniques, mulches, silt fences, or other devices

capable of preventing erosion, migration of sediments, and bank failure. All disturbed land surfaces and sloped areas affected by the project must be stabilized.

O. FORESTRY

The South Carolina Forestry Commission implements a coordinated, statewide Best Management Practices (BMP) Program for forestry-related activities, which is supported in part by an annual 319 grant. The BMP Program focuses on a proactive approach to preventing NPS pollution through aerial detection of harvesting sites and courtesy exams by trained Forestry BMP Specialists. The courtesy exams provide forest landowners with site-specific BMP information that can be included in timber sale contracts.

The program includes a water quality BMP training program for timber harvesters. The program also incorporates an enforceable mechanism to ensure compliance with the BMPs. Close cooperation with DHEC is essential on sites referred for enforcement action and in correcting problems to ensure compliance with water quality requirements. NPS Staff meet with the Forestry Commission at least annually and conduct an annual visit to a harvesting site to see BMPs that have been implemented.

P. GROUNDWATER

Groundwater is the source of drinking water for 40 percent of South Carolina's population and is used by agricultural, industrial, and commercial entities. Recognizing that restoration of contaminated groundwater is expensive and technologically complex, DHEC focuses on protecting the quality and quantity of the state's groundwater resources through permitting and reporting, underground injection control, and private well inspection programs.

Source Water and Wellhead Protection

DHEC provides Source Water Assessments to public water supply systems that contain information about how susceptible a drinking water source may be to contamination, which can be used to mitigate potential NPS pollution. DHEC and the SC Rural Water Association provide technical assistance to communities developing and implementing source water protection plans based on assessment results.

Q. MINING

In 1974, the SC Mining Act was passed to ensure all mined lands would be returned to some useful purpose and to protect people and the environment. The Act defines mining as the removal of ores from the ground for sale (i.e. granite quarries) or for use in a business (i.e. brick manufacturing). There are several types of surface mining done in South Carolina: open pit (i.e. granite, vermiculite), strip mines (i.e. sand, clay, gravel), and sand dredging from river bottoms.

South Carolina issues two types of mine permits, individual and general, and one mineral exploration certificate. Mine permits and certificates are issued through the Mining and Reclamation section in DHEC's Bureau of Land and Waste Management. Nonmetal mineral mining is permitted through the Bureau of Water's Stormwater Division. Inspections of mining operations are conducted until reclamation of the mine is complete.

VI. PROTECTING HEALTHY WATERS

Traditionally, most of South Carolina's NPS Management work has focused on restoring impaired waters and reducing nonpoint source impacts on surface water quality. However, South Carolina's 319 Program understands the importance of protecting high-quality waters to assist in guiding State priorities and actions.

Such efforts to avoid impairments will be more cost-effective—especially to tax payers—, and in the long run, have fewer technical challenges than would restoration efforts for impaired waterbodies. High-quality waters are known to provide an array of ecological, economic, and health [benefits](#), such as buffering water quality degradation in the surrounding area, increasing resilience to the impacts of climate change, reducing drinking water treatment and infrastructure costs, and reducing flood mitigation costs—all aspects critical to South Carolina. Thus, South Carolina's NPS Program will focus more on protection in the next five years than has previously been the case.

To assist in achieving enhanced water quality protection for the state, South Carolina's NPS Program anticipates coordinating with watershed groups, land management agencies, and land trusts to protect healthy waters. Several such groups have already been identified, such as the SC Land Trust Network and The Longleaf Alliance. The NPS Management Program will work with these and other watershed partners to develop watershed-based plans (WBPs) for watersheds with current high-quality waters.

One FY18 319 implementation project has focused entirely on conservation easements, and several watershed-based plans have voluntarily identified and incorporated protection aspects, such as conservation easements and prioritization of land for protection within the watershed. However, going forward, protection best management practices will be required in DHEC-accepted WBPs and will thus allow for more protection elements to be eligible for 319 grant funding, ensuring increased protection of state high-quality waters.

VII. CLIMATE CHANGE

Climate change in South Carolina could result in both higher stream temperatures and more intense watershed disturbances. Examples of more intense watershed disturbances include: rain events, more frequent and intense flooding, tropical storm events, higher stream flows, rising sea levels, increased erosion rate, displacement of coastal wetlands, more frequent and larger wildfires, and tidal mixing. Such changes would likely cause increased levels of pathogens, nutrients, and dissolved oxygen in waterbodies. These changes could then also cause harm not only to humans, but to native aquatic life populations, such as macroinvertebrates and fish.

Thus, the South Carolina NPS Program will also consider future threats when managing watersheds and 319 grants. While protection and restoration efforts are specifically taken to improve water quality, they can also have a significant positive impact on the social and economic wellbeing of South Carolina and its residents now and into the future. Integration of flood resiliency and adaptation planning approaches as a response to the potential impacts of climate change, as noted above, will therefore be included in watershed planning through the NPS Program, following the EPA's nine element watershed-based plan format.

Many of the actions described in this Plan will assist in mitigating the impacts of more intense watershed disturbances and the related impacts on water quality. Examples of some of these actions include:

- Assessing, prescribing, and implementing best management practices (BMPs) that project forward what local needs may be and incorporate adaptation planning aspects to ensure proposed BMPs take more intense watershed disturbances and their impacts into consideration
- Designing, selecting, and placing BMPs that consider seasonal and event flow changes (e.g. set agricultural exclusion fencing back further)
- Including BMPs that protect and/or restore watershed resiliency
- Retaining forests through conservation easements
- Using native vegetation to protect and restore wetland areas and riparian areas
- Disconnecting direct discharge from impervious surfaces from streams
- Using Green Infrastructure and Low-Impact Development
- Reconnecting floodplains with rivers
- Supporting local efforts that address climate change-related water quality impacts

VIII. PARTNER ORGANIZATIONS AND OUTSIDE FUNDING

A key element to the success of the NPS Program is close partnering and coordination with outside organizations. This occurs at both a programmatic level and at a watershed stakeholder level for specific project implementation. Programmatic partners work with DHEC to implement strategies that are common to organization missions. At a watershed level, most NPS projects are led by a local entity in partnership with various governmental agencies, in addition to DHEC, that have programs targeting the reduction of NPS pollution as part of their overall mission and program goals. These entities have provided technical support, helped establish relationships with stakeholders, and provided additional funding for some projects.

In addition to federal funding provided by the Clean Water Act, South Carolina provides state funds to carry out NPS activities. Section 319 requires federal funds to be matched 40 percent with non-federal funds for both program management and watershed project activities. Match includes cash and in-kind services used for NPS activities if they are not sustained by another federal source. Federal sources of funding may be used in combination with 319 implementation project funds. However, other federal sources of funding may not be used as part of the required 40 percent match for 319 projects.

To expand on its history of successful partnerships, DHEC continuously seeks to broaden its base of partners. These efforts will ensure a broader base of stakeholder support for watershed-based plan implementation, identify new entities that have a history of working with partners to potentially participate in the 319 Program, and increase opportunities for collaborative funding.

DHEC has successfully collaborated with organizations on NPS-related projects including:

- USDA NRCS
- US Forest Service
- Clemson University
- National Park Service
- SC Forestry Commission
- US Department of Agriculture
- US Geological Survey
- Local governmental agencies
- SC Department of Natural Resources
- Regional Councils of Government
- SC Soil and Water Conservation Districts
- Drinking water utilities
- Clemson University Extension
- Nonprofit organizations

Several examples of federal sources of funding that can complement 319 grant projects are listed on 319 project solicitations, and include:

- USDA Natural Resources Conservation Service – Environmental Quality Incentives Program (EQIP)
- USDA Natural Resources Conservation Service – USDA Conservation Innovation Grant
- USFEMA – Hazard Mitigation Assistance
- USHUD – Community Development Block Grant (CDBG)

IX. PLAN OBJECTIVES AND MILESTONES

South Carolina has established a detailed set of five-year objectives and milestones to track progress towards meeting the goals of this Plan. DHEC believes that these strategies direct the NPS Program to activities most likely to result in water quality improvements as well as efficient spending of 319 grant funds. Related partners are included with each milestone as well as a schedule of when each milestone will occur based on the year. These milestones will be included in Annual Workplans for the State's 319 grant and will be reported in NPS Annual Reports.

KEY

The following key should be referenced to determine which NPS Program goals, guiding principles, and other considerations are related to each milestone.

2 GOALS:

- (P) Protection
- (R) Restoration

5 GUIDING PRINCIPLES:

- (1) Provide technical assistance, education, and outreach to effectively address NPS pollution
- (2) Strengthen partnerships and collaborative efforts to address NPS pollution
- (3) Ensure compliance with regulatory requirements
- (4) Administer the NPS program efficiently and effectively
- (5) Utilize innovative and progressive strategies, ideas, and methods

1 OTHER CONSIDERATION:

- (C) Climate change

SOUTH CAROLINA NPS PROGRAM 5-YEAR WORKPLAN

				Schedule				
Five-Year Objective	Milestone	Partners	Key	2020	2021	2022	2023	2024
Monitoring and WQ Assessment								
Assess statewide water quality through consistent monitoring to identify waterbodies not fully meeting standards due to nonpoint sources of pollution	a) Collect and analyze monthly samples at 90 sites for the probabilistic monitoring program	DHEC Aquatic Science Programs	P, R, C, 4	X	X	X	X	X
	b) Collect and analyze monthly samples at 235 base sites for routine monitoring	DHEC Aquatic Science Programs	P, R, C, 4	X	X	X	X	X
	c) Perform macroinvertebrate assessments statewide, typically 70	DHEC Aquatic Science Programs	P, R, C, 4	X	X	X	X	X

	sites per year depending on hydrology							
	d) Measure chlorophyll a levels at 100 sites monthly May through October	DHEC Aquatic Science Programs	P, R, C, 4	X	X	X	X	X
	e) Collect and analyze monthly water quality samples at established DHEC monitoring sites in all current NWQI watersheds	DHEC Aquatic Science Programs	P, R, C, 1, 2, 4	X	X	X	X	X
	f) Collect fish tissue samples at approximately 60 sites statewide and obtain other samples through partnering agencies and events. Analyze 900 tissue samples per year for mercury	DHEC Aquatic Science Programs	P, R, 2, 4	X	X	X	X	X
Implement and update sanitary surveys based on coastal water quality monitoring data	a) Collect monthly water quality samples at 450 sites to be used to establish shellfish classifications	DHEC Shellfish Sanitation Program	P, R, C, 4	X	X	X	X	X
	b) Perform sanitary surveys, identify needed corrective actions, and develop shellfish harvesting classifications in 25 shellfish growing areas	DHEC Shellfish Sanitation Program	P, R, C, 4	X	X	X	X	X
	c) Generate a trend report for annual shellfish harvesting classifications	DHEC Shellfish Sanitation Program	P, R, C, 1, 4	X	X	X	X	X
Develop and implement monitoring studies in watersheds where 319 projects have been or will be implemented	a) Update NPS monitoring QAPP to include new projects and other revisions and deliver plan to Department Quality Assurance Project Officer for final approval	DHEC Aquatic Science Programs; DHEC Watersheds & Nonpoint Source	P, R, C, 2, 3, 4	X	X	X	X	X
	b) Conduct monthly sampling at identified sites within 319 project watersheds, including all impaired locations, once projects are awarded and continuing at least 2 years after each project is completed	DHEC Aquatic Science Programs; DHEC Watersheds & Nonpoint Source	P, R, C, 2, 4	X	X	X	X	X
	c) Work closely with DHEC Aquatic Science Programs staff involved with 319 monitoring to ensure all 319 project sites are adequately monitored	DHEC Aquatic Science Programs; DHEC Watersheds & Nonpoint Source	P, R, C, 2, 4	X	X	X	X	X
Review 319 Monitoring Strategy and methods and revise as needed to	a) Meet with DHEC Aquatic Science Programs staff to optimize 319 monitoring strategy and methods;	DHEC Aquatic Science Programs; DHEC	P, R, C, 2, 4	X	X	X	X	X

most effectively assess 319 project water quality using available resources	incorporate results into State Monitoring Strategy	Watersheds & Nonpoint Source						
Effectively assess and document the impacts of 319-funded implementation projects on water quality through collection and analysis of samples	a) Analyze all samples according to appropriate analytical protocol	DHEC Aquatic Science Programs	P, R, 4	X	X	X	X	X
	b) Assess all 319 project sites within 1 year after completion of post-project monitoring and document any water quality improvements for inclusion in the Annual Report and Success Stories	DHEC Aquatic Science Programs; DHEC Watersheds & Nonpoint Source	P, R, 2, 4	X	X	X	X	X
	c) Compile, review, and document all available monitoring data for historical and recently completed 319 projects	DHEC Aquatic Science Programs; DHEC Watersheds & Nonpoint Source	P, R, 2, 4	X	X	X	X	X
Identify and develop success stories for fully or partially restored waterbodies primarily impaired by NPS pollution	a) Monitor promising 319 Success Story sites regularly	DHEC Aquatic Science Programs; DHEC Watersheds & Nonpoint Source	P, R, 2, 4, 5	X	X	X	X	X
	b) Identify and develop Success Stories each year for watersheds showing full restoration or showing improvement	DHEC Watersheds & Nonpoint Source	R, 1, 4	X	X	X	X	X
SC Integrated Report and TMDLs								
Develop, maintain, and distribute South Carolina's Integrated Report including Part 1: 303(d) List of Impaired Waters and Part 2: Section 305(b) Assessment and Reporting	a) Solicit external data for inclusion in 303(d) assessment	DHEC Aquatic Science Programs; DHEC 303(d), Modeling, & TMDL	P, R, C, 1, 2		X		X	
	b) Assess all DHEC data plus appropriate external data to determine impairment status for 303(d), typically 2,000 sites per 2-year cycle and assess all statistical survey sites for the 305(b) report, typically 450 sites per 2-year cycle	DHEC Aquatic Science Programs; DHEC 303(d), Modeling, & TMDL	P, R, C, 2, 3		X		X	
	c) Prepare and put draft 303(d) lists on public notice and address subsequent public comments.	DHEC 303(d), Modeling, & TMDL	P, R, C, 2, 3	X		X		X

	Prepare ADB-compatible spreadsheet and GIS data files associate with 303(d) list. Deliver the Integrated Report comprised of both the 303(d) and 305(b) reports to EPA for approval							
Work collaboratively with the 303(d), Modeling, & TMDL section to support prioritization of restoration efforts	a) Provide assistance to TMDL staff for prioritizing locations for future TMDL development. An important criterion for TMDL prioritization is determining where there is a higher potential for implementation	DHEC 303(d), Modeling, & TMDL; DHEC Watersheds & Nonpoint Source	R, 2, 4, 5	X	X	X	X	X
319 & WBP Grants								
Aid stakeholders and selected WBP development projects in the development of WBPs	a) Serve as a facilitator for WBP development, as needed	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 4	X	X	X	X	X
	b) Work with Long Leaf Alliance, Savannah River Clean Water Fund, and SC Land Trust Network on WBPs and related feasible projects that highlight watersheds for protection	DHEC Watersheds & Nonpoint Source; land trusts	P, R, C, 1, 2, 4, 5	X	X	X	X	X
	c) Reach out to and work with drinking water intakes for WBP development and subsequent 319 projects	DHEC Watersheds & Nonpoint Source; drinking water intakes	P, R, C, 1, 2, 4, 5	X	X	X	X	X
	d) Incorporate protection strategies into all WBPs, such as conservation easements	DHEC Watersheds & Nonpoint Source	P, C, 1, 2, 4, 5	X	X	X	X	X
	e) Incorporate protection of unimpaired/high quality waters into WBPs, when possible	DHEC Watersheds & Nonpoint Source	P, C, 1, 2, 4, 5	X	X	X	X	X
	f) Incorporate adaptation planning and ways to address climate change impacts, especially for coastal entities, in WBPs	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 4, 5	X	X	X	X	X
	g) Review and provide draft comments on WBPs, ensuring compliance with EPA's nine required elements for 319 grant eligibility	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 3, 4, 5	X	X	X	X	X
Administer 319 grants including issuing and ensuring compliance with	a) Award grant agreements following annual project selection	DHEC Watersheds & Nonpoint Source	P, R, C, 3, 4	X	X	X	X	X

grant agreements, processing payments, and monitoring non-federal match	b) Review quarterly requests for reimbursement and progress reports from grantees to ensure compliance and track expenditures	DHEC Watersheds & Nonpoint Source	P, R, C, 3, 4	X	X	X	X	X
	c) Conduct a site visit with each active project at least once annually to ensure adherence to project goals and timeline	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 3, 4	X	X	X	X	X
Manage the 319 and WBP program, including solicitations and selection of projects	a) Update RFPs for WBP development and 319 implementation proposals at least annually based on changes, priorities, lessons learned, etc.	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 4, 5	X	X	X	X	X
	b) Issue statewide solicitations for WBP development and 319 implementation proposals at least annually	DHEC Watersheds & Nonpoint Source	P, R, C, 2, 3, 4	X	X	X	X	X
	c) Convene review committee to select projects based on NPS Program priorities after each grant solicitation period	DHEC Watersheds & Nonpoint Source; DHEC Ocean and Coastal Resource Management; DHEC Aquatic Science Programs	P, R, C, 2, 3, 4	X	X	X	X	X
	d) Annually award funding to committee-selected 319 implementation projects and WBP development projects	DHEC Watersheds & Nonpoint Source	P, R, 2, 3, 4	X	X	X	X	X
	e) Award 319 implementation projects with protection components, climate change considerations, and innovative BMPs, as able	DHEC Watersheds & Nonpoint Source	P, R, C, 4, 5	X	X	X	X	X
	f) Alert regional DHEC offices to new 319 implementation projects in their areas, including OCRM	DHEC Watersheds & Nonpoint Source; Regional DHEC Offices; DHEC Ocean and Coastal Resource Management	P, R, 2, 4, 5	X	X	X	X	X
	g) Create tools and share resources to assist in stakeholder-led development of watershed-based	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 4, 5	X	X	X	X	X

	plans and 319 implementation projects							
Work closely with the SCDHEC Water Pollution Compliance staff for 319 project proposals	a) Consult on project proposals to ensure BMPs go “above and beyond” MS4 requirements	DHEC Watersheds & Nonpoint Source; DHEC Water Pollution Compliance	P, R, 1, 2, 3, 4	X	X	X	X	X
	b) Obtain and have MS4 staff put Letters of Assurance on file to ensure 319-funded BMP load reductions will not be counted as meeting NPDES permit requirements	DHEC Watersheds & Nonpoint Source; DHEC Water Pollution Compliance	P, R, 2, 3, 4, 5	X	X	X	X	X
Ensure consistency with national and regional goals and requirements through participation in trainings, conferences, meetings, and webinars	a) Participate in at least 1 national or regional conference and 1 national or regional training such as the National NPS Conference, GRTS Training, or Region IV NPS Coordinators Meeting	DHEC Watersheds & Nonpoint Source	P, R, 2, 4, 5	X	X	X	X	X
	b) Participate in ACWA 319/NPS Workgroup Webinars	DHEC Watersheds & Nonpoint Source	P, R, 2, 4, 5	X	X	X	X	X
	c) As necessary, update the formal list of priority watersheds, according to NWQI and EPA priorities	DHEC Watersheds & Nonpoint Source; EPA; USDA NWQI	R, 2, 4, 5	X	X	X	X	X
Estimate load reductions for active and recently completed 319 projects	a) Increase cumulative annual load reductions resulting from 319-funded BMPs	DHEC Watersheds & Nonpoint Source; 319 Projects	P, R, 2, 4	X	X	X	X	X
	b) Upload BMP and load reduction information for all applicable projects to GRTS by February 28 in accordance with FY2019 revisions and mandated data elements	DHEC Watersheds & Nonpoint Source	P, R, 3, 4	X	X	X	X	X
Use the Grants Reporting and Tracking System (GRTS) to report on progress of active 319 projects	a) Regularly update and comprehensively review all project information in GRTS to ensure completeness by EPA’s February 28 annual deadline in accordance with FY2019 revisions and mandated data elements	DHEC Watersheds & Nonpoint Source	P, R, 3, 4	X	X	X	X	X
Prepare Annual Report to Congress on progress in meeting NPS Program goals	a) Submit Annual Report to EPA by December 1st each year. Include information on all open 319 implementation projects and	DHEC Watersheds & Nonpoint Source	P, R, 3, 4	X	X	X	X	X

	report on status of Plan milestones for the year							
Submit annual 319 grant application to EPA	a) Prepare annual workplan, budget, and grant application. Submit to EPA by September 30 th each year	DHEC Watersheds & Nonpoint Source	P, R, 3, 4	X	X	X	X	X
Complete grant close-out packages	a) Assemble and submit grant closeout packages within 90 days of a grant close. Grants from fiscal years 2015 through 2019 will be closed out in this 5-year Plan period	DHEC Watersheds & Nonpoint Source	P, R, 3, 4	X for FY 15	X for FY 16	X for FY 17	X for FY 18	X for FY 19
Work with the SC Forestry Commission to implement a Statewide Forestry BMP Compliance Program	a) Request annual workplan in April/May to have in hand by July, obtain EPA approval, and then issue or amend grant agreement with SC Forestry Commission in August	DHEC Watersheds & Nonpoint Source; SC Forestry Commission; EPA	P, R, 2, 3, 4	X	X	X	X	X
	b) Renew contract every five years as appropriate	DHEC Watersheds & Nonpoint Source	P, R, 2, 4	X				
	c) Follow up on any forestry referrals for water quality impacts	DHEC Water Pollution Compliance	P, 1, 2, 3	X	X	X	X	X
Regularly review NPS Management Plan for effectiveness and applicability to programmatic needs	a) Perform cursory plan review and update objectives and milestones as needed as part of annual application process and Annual Report preparation	DHEC Watersheds & Nonpoint Source	P, R, C, 3, 4, 5	X	X	X	X	X
	b) Perform full plan review and update plan as needed	DHEC Watersheds & Nonpoint Source	P, R, C, 3, 4, 5	X		X		X
Stakeholder Outreach								
Collaborate with and provide technical assistance and water quality information to stakeholders to support the effective management of NPS pollution	a) Participate in stakeholder meetings and committees	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 4, 5	X	X	X	X	X
	b) Respond to requests for information including assistance with obtaining and analyzing water quality data	DHEC Watersheds & Nonpoint Source	P, R, 1, 2, 4	X	X	X	X	X
	c) Attend NRCS State Technical Committee meetings	DHEC Watersheds & Nonpoint Source; NRCS	P, R, 2, 4	X	X	X	X	X
	d) Distribute booklets about reining in runoff, as available	DHEC Watersheds & Nonpoint	P, R, 1, 4	X	X	X	X	X

		Source						
Increase statewide knowledge of the 319 program, projects, and grant opportunities	a) Present on the 319 Program, grant opportunities, and projects at various events and conferences	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 4, 5	X	X	X	X	X
	b) Encourage stakeholder organizations to apply for funding for WBP development and 319 implementation grants through various means, including emails, flyers, handouts, conferences, presentations, events, etc.	DHEC Watersheds & Nonpoint Source	P, R, C, 1, 2, 4, 5	X	X	X	X	X
Coastal NPS Program								
Decrease marine debris through voluntary partnerships and programs such as Adopt-a-Beach and the Clean Marina Program	a) My Coast – Adopt-a-Beach: Promote increased participation; produce annual summary including number of groups and number of debris items by type	DHEC Ocean and Coastal Resource Management	P, R, 1, 2, 4	X	X	X	X	X
	b) Participate in SC Clean Marina program as administered by the SC Marine Association	DHEC Ocean and Coastal Resource Management	P, R, 1, 2, 4	X	X	X	X	X
Collaborate with external partners to improve coastal awareness of non-point source pollution	a) Collaborate with the Ace Basin and North Inlet National Estuarine Research Reserves as well as the SC Coastal Information Network on preparation of communication materials that build awareness of BMPs among coastal stakeholders	DHEC Watersheds & Nonpoint Source; DHEC Ocean and Coastal Resource Management	P, R, 1, 2, 4, 5	X	X	X	X	X
Enhance and track marine debris removal efforts through collaboration with state and regional partners	a) Convene the Abandoned Vessel Working Group to improve coordination between federal, state, and local partners on abandoned/derelict vessels	DHEC Ocean and Coastal Resource Management	R, 2, 3, 4	X	X	X	X	X
	b) Identify and apply for marine debris removal funding opportunities with local, state, and/or federal partners	DHEC Ocean and Coastal Resource Management	R, 2, 3, 4	X	X	X	X	X
	c) Identify and assess Abandoned and Derelict Vessels (ADV) and other large marine debris items and process through compliance/enforcement procedures, if appropriate	DHEC Ocean and Coastal Resource Management	R, 3, 4	X	X	X	X	X
Continue interagency coordination and planning to study and mitigate climate change and related	a) Coordinate with SC DNR and other Living Shorelines Working Group partners on outreach and education for living shorelines	DHEC Ocean and Coastal Resource Management	P, R, C, 1, 2, 4, 5	X	X	X	X	X
	b) Continue to work with local governments on local	DHEC Ocean and Coastal	P, R, C, 1,	X	X	X	X	X

impacts such as shoreline changes and coastal erosion	comprehensive beach management plans and waterbody management planning efforts	Resource Management	2, 4, 5					
Coordinate management activities between the Coastal Management Program and 319 programs	a) Coastal Program and 319 staff will meet at least annually to coordinate efforts	DHEC Watersheds & Nonpoint Source; DHEC Ocean and Coastal Resource Management	P, R, C, 2, 4	X	X	X	X	X
	b) Coastal Program staff will serve on the 319 Review Committee for each 319-implementation funding round	DHEC Watersheds & Nonpoint Source; DHEC Ocean and Coastal Resource Management	P, R, C, 2, 4, 5	X	X	X	X	X
Ensure marina compliance with operation and maintenance manuals	a) OCRM Compliance and Enforcement staff will evaluate marina operation and maintenance manuals to ensure compliance with Critical Area permitting requirements	DHEC Ocean and Coastal Resource Management	P, R, C, 2, 3, 4	X	X	X	X	X
Champions of the Environment								
Promote NPS awareness through the Champions of the Environment grant awards program	a) Promote the Champions program through teacher workshops, environmental educators' conferences, social media, mail outs, targeted emails, and organizational webpages and newsletters	DHEC Watersheds & Nonpoint Source	P, R, 1, 2, 5	X	X	X	X	X
	b) Award 8 grants to environmental education projects. Develop and air TV commercials broadcasting each project. Promote winning projects through social media and local news coverage.	DHEC Watersheds & Nonpoint Source	P, R, 1, 2, 5	X	X	X	X	X
Adopt-A-Stream								
Increase awareness of local water quality and the Adopt-A-Stream (AAS) program	a) Encourage MS4s and other municipalities to use SC AAS as an education and outreach method for water quality awareness	DHEC Watersheds & Nonpoint Source	P, R, 1, 2, 5	X	X	X	X	X
	b) Present Adopt-A-Stream annually at the SC Association of Stormwater Managers (SCASM) meeting	DHEC Watersheds & Nonpoint Source	P, R, 1, 2, 5	X	X	X	X	X

	c) Include AAS equipment purchases as part of 319 grants planning to incorporate the SC AAS program	DHEC Watersheds & Nonpoint Source	P, R, 1, 2, 4, 5	X	X	X	X	X
	d) Make 319 grantees aware of the program and the possibility of adding local screening data	DHEC Watersheds & Nonpoint Source	P, R, 1, 2, 4, 5	X	X	X	X	X
	e) Add AAS as an example of an education/outreach component in the revised MS4 permit.	DHEC Watersheds & Nonpoint Source; DHEC Stormwater Permitting; DHEC Water Pollution Compliance	P, R, 1, 2, 5	X	X	X	X	X
SC Watershed Atlas								
Maintain SC Watershed Atlas	a) Respond to queries generated from Atlas users	DHEC Watersheds & Nonpoint Source; DHEC GIS	1, 2	X	X	X	X	X
	b) Communicate feedback and queries to Agency GIS program	DHEC Watersheds & Nonpoint Source	2	X	X	X	X	X
	c) Communicate with Bureau of Water programs to ensure assessed data are converted into Atlas specific tables and information, as the data becomes available	DHEC Watersheds & Nonpoint Source; DHEC BOW; DHEC GIS	2	X	X	X	X	X
	d) Coordinate with GIS program to ensure timely updates to the Atlas	DHEC Watersheds & Nonpoint Source; DHEC GIS	2	X	X	X	X	X
Document 319 implementation practices using GIS	a) Track all 319 implementation projects and locations of completed WBPs to the Atlas	DHEC Watersheds & Nonpoint Source; DHEC GIS	P, R, 1, 4	X	X	X	X	X
	b) Update Atlas as new projects are awarded	DHEC Watersheds & Nonpoint Source; DHEC GIS	P, R, 1, 4	X	X	X	X	X
	c) Provide links to more information on 319 projects,	DHEC Watersheds & Nonpoint	P, R, 1, 2, 4, 5	X	X	X	X	X

	completed WBPs, and project Success Stories	Source						
Advisories								
Increase awareness of health risks associated with swimming in impaired waters and educate citizens about how to reduce those risks and their NPS contributions to local waters	a) Annually review and provide NPS educational information as needed on Agency swimming advisory website	DHEC Aquatic Science Programs; DHEC Watersheds & Nonpoint Source	1	X	X	X	X	X
	b) Maintain a swim advisory line for the public	DHEC Watersheds & Nonpoint Source	1	X	X	X	X	X
Increase awareness of atmospheric deposition of mercury and the associated health risks through annual Fish Consumption Advisory information	a) Produce and distribute the SC Fish Consumption Advisory booklet as funds allow, and revise website	DHEC Aquatic Science Programs	1	X	X	X	X	X
State Revolving Fund (SRF)								
Prioritize SRF projects according to their potential to improve water quality and complement existing NPS reduction efforts	a) Assist SRF staff with goal setting in the CWSRF Intended Use Plan and, when it occurs, participate in revision of SRF Priority Ranking System to thoroughly include criteria that target NPS projects and watershed-based plan implementation	DHEC Watersheds & Nonpoint Source; DHEC State Revolving Fund	P, R, 1, 2, 5	X	X	X	X	X
	b) Using the SRF Priority Ranking System, review and score each project requesting SRF funding. Review includes assessment of priority watersheds, impairments, TMDLs, and 319 projects in the project area	DHEC Watersheds & Nonpoint Source; DHEC State Revolving Fund	P, R, 1, 2, 4, 5	X	X	X	X	X
Alternative Funding								
Identify and advertise alternate funding opportunities for WBP and 319 projects	a) Identify alternate avenues for WBP development beyond DWSRF funds and 319 implementation projects (both federal and non-federal match) beyond 319 grant funding	DHEC Watersheds & Nonpoint Source	R, P, C, 2, 4, 5	X	X	X	X	X
	b) Where available, work with outside entities to combine funding opportunities to support WBP and 319 grants	DHEC Watersheds & Nonpoint Source	R, P, C, 1, 2, 4, 5	X	X	X	X	X

	c) Advertise alternate avenues for grant funding in annual RFPs, the SCDHEC website, partner websites, and other avenues	DHEC Watersheds & Nonpoint Source	R, P, C, 1, 2, 4, 5	X	X	X	X	X
Coordinate with SRF staff to encourage implementation of NPS Plan goals and leverage State Revolving Fund money to address waterbodies affected by NPS pollution	a) Work in conjunction with CWSRF to advertise the use of SRF funds for NPS reduction projects and the potential for combining CWSRF and 319 funds for NPS reduction projects	DHEC Watersheds & Nonpoint Source; DHEC State Revolving Fund	R, P, 1, 2, 4, 5	X	X	X	X	X
	b) Utilize the joint funding opportunities fact sheet with RFPs to encourage the combined use of 319 and CWSRF funds for projects addressing NPS pollution	DHEC Watersheds & Nonpoint Source; DHEC State Revolving Fund	R, P, 1, 2, 4, 5	X	X	X	X	X
	c) When identified, point out joint funding opportunities to public entities with potential projects	DHEC Watersheds & Nonpoint Source; DHEC State Revolving Fund	R, P, 1, 2, 4, 5	X	X	X	X	X
Encourage the use of USDA resources to complement existing 319 efforts	a) Encourage grantees to utilize EQIP and other USDA funding options in watersheds with ongoing implementation projects, in annual solicitations and by word of mouth	DHEC Watersheds & Nonpoint Source; USDA NRCS	R, P, C, 1, 2, 4, 5	X	X	X	X	X
	b) Refer septic calls outside of active septic repair/replacement 319 implementation projects to USDA's Rural Development Single-Family Housing Repair/Section 504 Home Repair program	DHEC Watersheds & Nonpoint Source; USDA Rural Development	R, P, 1, 2, 4, 5	X	X	X	X	X
Permitting								
Issue permits, perform inspections, respond to complaints, make recommendations for improvement of stormwater-related programs, and coordinate compliance and enforcement action as needed	a) Issue construction, industrial, and MS4 stormwater permits statewide including permits that require additional monitoring and/or installation of BMPs in impaired and TMDL watersheds	DHEC NPDES Stormwater Permitting	P, R, 3	X	X	X	X	X
	b) Conduct stormwater site inspections and perform MS4 program audits	DHEC Water Pollution Compliance	P, R, 3	X	X	X	X	X
	c) Investigate acute NPS complaints from the public and MS4s statewide	DHEC Water Pollution Compliance	P, R, 2, 3	X	X	X	X	X
	d) Refer incidents to enforcement when voluntary remediation to remediate acute NPS incidents is unsuccessful	DHEC Water Pollution Compliance; DHEC Water	P, R, 2, 3	X	X	X	X	X

		Pollution Enforcement						
Ensure proper installation of onsite wastewater systems and provide technical assistance as needed	a) Issue permits for new septic systems	DHEC Onsite Wastewater Division	P, R, 3	X	X	X	X	X
	b) Issue licenses for septic installers and servicers	DHEC Onsite Wastewater Division	P, R, 2, 3	X	X	X	X	X
	c) Provide compliance assistance by investigating referrals and failing onsite wastewater systems	DHEC Onsite Wastewater Division	P, R, 2, 3	X	X	X	X	X
Permit, inspect, and provide technical assistance for agricultural facilities	a) Prepare and/or review agricultural waste permits statewide for animal facilities	DHEC Agricultural Permitting	P, R, 3	X	X	X	X	X
	b) Perform inspections including follow-up, complaints, site assessment, etc.	DHEC Agricultural Permitting	P, R, 2, 3	X	X	X	X	X
	c) Document noncompliant facilities and refer them to enforcement	DHEC Agricultural Permitting	P, R, 2, 3	X	X	X	X	X
Through 401 water quality certifications, require at least standard construction site BMP conditions to be implemented	a) Issue 401 water quality certifications requiring implementation of BMPs that will minimize erosion and migration of sediments on and off project sites during and after construction	DHEC Water Quality Certification and Wetlands; US Army Corp of Engineers	P, 3	X	X	X	X	X
Follow up on referrals for non-compliance and violations of the SC Pollution Control Act related to nonpoint source activities	a) Assign and follow up on all referrals	DHEC Water Pollution Control Division	R, 2, 3	X	X	X	X	X
	b) As needed, follow enforcement procedures for NPS stormwater and onsite wastewater violations	DHEC Water Pollution Control Division	R, 2, 3	X	X	X	X	X
Maintain a database to track permits, inspections, and compliance and enforcement actions	a) Enter all facility- and permit-related information into the Environmental Facility Information System (EFIS) or its replacement database	DHEC BOW; DHEC Ocean and Coastal Resource Management	P, R, 3	X	X	X	X	X

X. NONPOINT SOURCE PLAN EVALUATION — EVALUATING SUCCESS

South Carolina’s NPS Management Program’s success is based on meeting the Program’s two long-term goals of protecting and restoring the State’s water quality from the negative impacts of nonpoint source pollution. Specifically, the NPS Program strives to achieve water quality standards in waterbodies affected by NPS pollution, as documented through water quality monitoring efforts.

The Nonpoint Source Program uses a variety of environmental and administrative measures to determine the Plan’s success, both in preventing and reducing the impacts of NPS pollution. Although water quality standard attainment maintains that the goals of the NPS Program are being met, meeting a water quality standard may take years to achieve and can be difficult to demonstrate in the short term given the variability of natural systems, the limited resources available to address the problems, and the extent and nature of the problem. Therefore, interim measures of success beyond water quality monitoring results are also important measures of progress in achieving improvements at the watershed scale.

This Section thus identifies the steps to evaluate the success of the Plan’s five-year objectives and milestones, as well as DHEC’s progress toward its two overarching Program goals.

A. PROGRAMMATIC EVALUATION

As mentioned, maintaining and attaining water quality standards can be a long-term achievement toward the State NPS Program’s goals. Interim measures of success can thus serve as evidence that the NPS Management Program is making progress toward meeting water quality standards.

South Carolina’s NPS Management Program tracks NPS Plan implementation progress and improvements through each five-year objective and annual milestone’s success (see Section IX). DHEC also:

- uses its Integrated Report, submitted to EPA biennially, to track the number of waterbodies that are partially or fully supporting beneficial uses.
- uses EPA’s Grant Reporting and Tracking System (GRTS) to document information addressing progress achieved through Section 319 funding provided by EPA to DHEC.
- tracks project-specific measures of success as outlined in EPA’s strategic plan including the amount of pollutant load reductions resulting from 319-funded projects and NPS-impaired waterbodies that are fully or partially restored.
- documents progress in achieving NPS Program goals through Annual Reports to EPA and 319 grant Closeout Reports.
- reports 319-funded implementation project Success Stories highlighting waterbodies that are no longer impaired, waterbodies that have improving water quality trends, and healthy waterbodies that are being protected.

DHEC will use all measures of success to refine and adapt the NPS Program to changing programmatic, financial, and water quality conditions. DHEC will review the NPS Management Program each year, with a complete review every five years, and revise program components as necessary. As the Program seeks to

better document results of NPS implementation activities, it will work to refine its methods to more accurately and efficiently track and evaluate progress toward improving water quality.

B. EDUCATION AND OUTREACH EVALUATION

Education and outreach are required components to all 319 implementation projects as well as watershed-based plan development work, as it is necessary to ensure that the public has appropriate resources and knowledge to address nonpoint source issues and to maintain best management practices implemented on their land. Because addressing nonpoint source pollution is voluntary, ensuring that the public is informed about NPS pollution issues is critical to meeting DHEC's two goals. The NPS Program provides detailed information on its website and on handouts to the public. Grant-funded projects have evaluation tools in place to help maintain successful education and outreach efforts and to adjust the strategy as needed. The intent of these tools is to improve environmental conditions and bring about positive behavioral changes. Grant-funded projects use a variety of evaluation tools to measure and report on initial knowledge and changes in knowledge, behavior, or attitudes toward NPS pollution and best management practices, such as focus groups or surveys.

C. WATER QUALITY IMPROVEMENT EVALUATION

Water quality monitoring is critical for assessing the State NPS Management Program's long-term success. Thus, water quality monitoring data provides information necessary to assess the quality of the State's waterbodies and evaluate the effectiveness of protection and improvement efforts. Data allows decisionmakers to determine water program priorities and keeps the public up to date on important water quality trends and accomplishments.

319 Implementation Project Monitoring

Water quality monitoring is an important part of evaluating 319 implementation projects. The goal is protection and restoration—maintenance or attainment of water quality standards and removal of the waterbody from the 303(d) list of impaired waters. Full restoration and subsequent delisting are often difficult to achieve due to the variety of sources that may be contributing to the impairment and because upstream improvements may be attenuated at downstream monitoring sites. Thus, it is also important to document improvement as well as attainment.

Project effectiveness monitoring looks at how well a project reduces pollution on a small scale. This data ensures that best management practices are effective and advises maintenance activities that are necessary for long-term success. Monitoring is often used to populate a model demonstrating the effectiveness of a project, such as with pollutant load reductions. Effectiveness monitoring is required for implementation projects funded with Section 319 grant contracts. Thus, DHEC monitors all 319-funded watershed projects at existing, historic, or new DHEC water quality monitoring site(s) for the parameter(s) of concern during the life of the project and for at least two years after the project is completed. Monitoring frequency is once per month. Project monitoring data is assessed to identify 319 Success Stories and for DHEC's 303(d) list of impaired waters and is provided to EPA for tracking on a national level. It is important to mention that individual project success is not necessarily transferable to broad-scale water quality impacts.

Surface Water Monitoring

DHEC also collects data from a statewide network of ambient monitoring sites, which determines long-term water quality trends, assesses attainment of water quality standards, identifies locations in need of additional attention, and provides background information for planning and evaluation. Data is collected from ongoing fixed locations and statewide probability-based sites. Each is designed to provide data at different spatial and temporal scales. For a detailed discussion of each of these components, please see the most recent version of the State of South Carolina Monitoring Strategy, which can be accessed by visiting the [Surface Water Monitoring webpage](#). Data collected is used for various purposes, including identifying waters not fully meeting designated uses due to nonpoint source pollution, assessing the effectiveness of NPS controls, and assisting in enforcement activities.

Fish Tissue Monitoring

DHEC collects fish from South Carolina lakes, streams, rivers, and estuaries to monitor the levels of contaminants in fish tissue. The data is used each year to calculate consumption rates for the [South Carolina Fish Consumption Advisory](#).

Macroinvertebrate Monitoring

Aquatic macroinvertebrate communities can be useful indicators of water quality because they respond to integrated stresses over time. Macroinvertebrate monitoring provides information about the general biological condition of State waters that may be subject to point and nonpoint source impacts. DHEC's Aquatic Science Programs use this data to support a variety of programs, including the NPS Program.

Algal Monitoring

The Phycology Program studies algae to help examine water quality. Algae need sunlight, water, and nutrients to survive and grow; however, too much of these nutrients, such as phosphorous and nitrogen, can cause excess algal growth, which can cause problems for fish and other aquatic organisms living in the water. Some algae can also produce toxins that can be harmful to both human health and the environment. To estimate how much algae is in the water, chlorophyll a is measured and assessed in lakes throughout the state to determine if the lakes are meeting water quality standards or if they may be impaired due to nutrient enrichment. Chlorophyll a measures with a high reading indicate the waterbody could be in poor health.

Shellfish Monitoring

DHEC's [Shellfish Sanitation Program](#) collects data to ensure that shellfish (oysters, clams, and mussels) and the areas from which they are harvested meet the health and environmental quality standards provided by federal guidelines and state regulations. DHEC monitors stations in management areas along South Carolina's coast for fecal coliform bacteria. To protect public health, each area is assigned a classification to indicate whether and under what conditions shellfish harvesting is allowed based on current water quality data. Temporary shellfish bed closures often occur due to excess bacteria from nonpoint sources of pollution. The Shellfish Program tracks potential sources of NPS pollution in coastal areas and promotes water quality restoration of state waters designated for shellfish harvesting.

Partner Monitoring

DHEC works with and accepts data from other state and local organizations to make decisions and focus resources. DHEC has developed a guidance document to explain the different types, sources, and uses of external data to ensure data consistency.

XI. SOUTH CAROLINA NONPOINT SOURCE PROGRAM CONTACTS

NPS PROGRAM CONTACTS

Carmony Corley

SC Nonpoint Source Coordinator

(803) 898-4401

corleyc1@dhec.sc.gov

Karin Skipper

Watersheds and 319 Section Manager

(803) 898-4187

skippekb@dhec.sc.gov

Jana Baxley

319 Grants Administrator

(803) 898-4213

baxleyjs@dhec.sc.gov

WATERSHED MANAGERS

Amanda Ley

Broad and Edisto Watershed Manager

(803) 898-4183

leyah@dhec.sc.gov

Andy Miller

Santee, Pee Dee, and Salkehatchie Watershed Manager

(803) 898-4031

millerca@dhec.sc.gov

Jordan Elmore

Catawba and Saluda Watershed Manager

(803) 898-4355

elmoreja@dhec.sc.gov

Eliza Nixon

Savannah Watershed Manager

(803) 898-4168

nixoneh@dhec.sc.gov

For more information, visit the nonpoint source website: www.scdhec.gov/watersheds



Bureau of Water
2600 Bull Street
Columbia, SC 29201

Submitted to EPA in fulfillment of the requirements of Section 319 of the Clean Water Act.

EXHIBIT E



Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems



Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems

Office of Water
Office of Research and Development
U.S. Environmental Protection Agency



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EXECUTIVE SUMMARY

The performance of onsite and clustered (decentralized) wastewater treatment systems is a national issue of great concern to the Environmental Protection Agency (EPA). Decentralized systems are used in 25 percent of the homes in the United States and 33 percent of new development, and they are permanent components of our nation's wastewater infrastructure. Decentralized wastewater treatment systems are defined here as managed individual onsite or clustered wastewater systems (commonly referred to as septic systems, private sewage systems, individual sewage treatment systems, onsite sewage disposal systems, or "package" plants) used to collect, treat, and disperse or reclaim wastewater from individual dwellings, businesses, or small communities or service areas. Unfortunately, many of the systems in use are improperly managed and do not provide the level of treatment necessary to adequately protect public health and surface and ground water quality. Proper management of decentralized systems involves implementation of a comprehensive, life-cycle series of elements and activities that address



public education and participation, planning, performance, site evaluation, design, construction, operation and maintenance, residuals management, training and certification/licensing, inspections and monitoring, corrective actions, recordkeeping/inventorying/reporting, and financial assistance and funding.

Therefore, EPA is issuing *Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems* (referred to

as the Management Guidelines) to enhance the performance and reliability of decentralized wastewater treatment systems through improved management programs. The Management Guidelines will help improve system performance by encouraging institutionalizing the concept of management; raising the quality of state, tribal, and local management programs; and suggesting minimum levels of activity.

Adequately managed decentralized systems that protect the environment and public health can provide an alternative to centralized wastewater treatment systems. EPA continues to support the most sustainable approach to implementing protective water pollution control solutions whether it be centralized or decentralized. The Management Guidelines are intended to be used when a decision to implement a decentralized approach is or has been made. They complement any other applicable federal, state, tribal, or local government requirements, including the National Pollutant Discharge Elimination System (NPDES) program under the Clean Water Act (CWA) and the Underground Injection Control (UIC) program under the Safe Drinking Water Act (SDWA).

EPA intends that state, tribal, and local authorities use the Management Guidelines, along with other applicable federal requirements, to help communities in meeting water quality and public health goals. The Management Guidelines can be integrated into a comprehensive watershed approach at the state, tribal, or local government level. The benefits of an adequate

Decentralized systems are used in 25% of U.S. homes and are permanent components of our nation's wastewater infrastructure.

management program include protection of water quality and public health, protection of consumers' investment in home and business ownership, increased

Not in My Septic System!

X Cloggers

diapers, cat litter, cigarette filters, coffee grounds, grease, feminine hygiene products, etc.

X Killers

household chemicals, gasoline, oil, pesticides, antifreeze, paint, etc.

onsite system service life and replacement cost savings, avoidance of transfers of water away from the source by conserving ground water, and elimination of the need to use a community's tax base to finance sewers. As noted above, and in more detail later in this document, proper management is a comprehensive term for achieving the long-term sustainability of a system, including adequate

operation and maintenance of the system. Although implementation of the Management Guidelines is voluntary, EPA strongly encourages considering them as a template in strengthening existing management programs and implementing new ones.

Unfortunately, although some management programs are effective, many existing state, tribal, and local rules that regulate onsite systems are not adequate to ensure proper performance. "Failure" of onsite systems is a term subject to much debate; however, 1995 U.S. Census data report that over 10 percent of all systems back up into homes or have wastewater emerging on the ground surface, and that more than half the systems in the United States were installed more than 30 years ago when onsite rules were nonexistent or poorly enforced. Few systems receive proper maintenance because homeowners are either unaware of the need for maintenance or find it a distasteful task. In addition, most regulatory programs

do not require homeowner accountability for system performance after installation. Although it is difficult to measure and document specific cause-and-effect relationships between onsite wastewater treatment systems and the quality of our water resources, it is widely accepted that improperly managed systems contribute to major water quality problems. The *National Water Quality Inventory 1996 Report to Congress* states that "improperly constructed and poorly maintained septic systems are believed to cause substantial and widespread nutrient and microbial contamination to ground water." Ultimately it is the absence of a comprehensive management program addressing each of these issues that prevents onsite and clustered (decentralized) systems from being considered as an effective and reliable wastewater treatment strategy. Consequently, the potential for health and water quality problems from poorly managed systems is increasing.

If effectively implemented by state, tribal, and local governments, the Management Guidelines might provide for a viable, long-term option for meeting public health and water quality goals, particularly for small and rural communities. In addition, appropriate

management programs will support the activities and approaches being used in other EPA programs and contribute toward achievement of mutual water quality and public health goals. These programs include Watershed Management, National Pollutant Discharge Elimination System, Biosolids and Residuals Management, Storm Water Management, Water Quality Management (including Total Maximum Daily Loads, or TMDLs), Water Quality Standards, Source Water Assessment and Protection, Underground Injection Control, Coastal Zone Management, Nonpoint Source Control Program, and Technology Transfer.

In deciding whether to use onsite systems, it is important to consider the risks they might pose to the

Few systems receive proper maintenance... most regulatory programs do not require homeowner accountability for system performance.

environment and public health. There may be cases where onsite systems are not appropriate because of the environmental sensitivity or public health concerns of an area. In the cases where onsite systems are appropriate, it is critical that they be managed to prevent environmental and public health impacts.

Five management models are provided as conceptual approaches with progressively increasing management controls as sensitivity of the environment and/or treatment system complexity increases (see box below). Each model consists of 13 critical elements that describe activities to be performed to achieve the management goal. The purpose of the models is to provide a guide to match the needed management controls to the potential

public health and water quality risks presented by decentralized systems in a particular area. The models are flexible so that programs can be customized by substituting elements of one program into another to accommodate local needs, practices, and conditions. The models are built around ensuring the accountability and competency of regulators and service providers through certification and continuing education, owners through education and/or inspection requirements, and third-party managers through contract and permit stipulations to achieve their goals. The “best” model program for a community is not necessarily in the higher levels, but rather is the model that provides the most appropriate management controls for the potential risks.

The Five Management Models

- **Management Model 1 - “Homeowner Awareness”** specifies appropriate program elements and activities where treatment systems are owned and operated by individual property owners in areas of low environmental sensitivity. This program is adequate where treatment technologies are limited to conventional systems that require little owner attention. To help ensure that timely maintenance is performed, the regulatory authority mails maintenance reminders to owners at appropriate intervals.
- **Management Model 2 - “Maintenance Contracts”** specifies program elements and activities where more complex designs are employed to enhance the capacity of conventional systems to accept and treat wastewater. Because of treatment complexity, contracts with qualified technicians are needed to ensure proper and timely maintenance.
- **Management Model 3 - “Operating Permits”** specifies program elements and activities where sustained performance of treatment systems is critical to protect public health and water quality. Limited-term operating permits are issued to the owner and are renewable for another term if the owner demonstrates that the system is in compliance with the terms and conditions of the permit. Performance-based designs may be incorporated into programs with management controls at this level.
- **Management Model 4 - “Responsible Management Entity (RME) Operation and Maintenance”** specifies program elements and activities where frequent and highly reliable operation and maintenance of decentralized systems is required to ensure water resource protection in sensitive environments. Under this model, the operating permit is issued to an RME instead of the property owner to provide the needed assurance that the appropriate maintenance is performed.
- **Management Model 5 - “RME Ownership”** specifies that program elements and activities for treatment systems are owned, operated, and maintained by the RME, which removes the property owner from responsibility for the system. This program is analogous to central sewerage and provides the greatest assurance of system performance in the most sensitive of environments.



The legal authority for regulating onsite and clustered (decentralized) wastewater treatment systems generally rests with state, tribal, and local governments. EPA recognizes that these units of government need

It is important to note that the management program models are not intended to supersede existing federal, state, tribal, or local laws and regulations.

a flexible framework and guidance to tailor their programs to the specific needs of communities and watersheds. Although each management program model stands alone, the models are intended only to

be guides in developing an appropriate management program. Activities in program elements of higher-level models may be incorporated into lower-level programs to assist the local program in achieving its desired objectives. Also, it is possible to implement more than one management program model within a jurisdiction as appropriate for the circumstances encountered, such as housing density, receiving environment characteristics, new development, high-volume or high-strength wastewaters, and so forth. Management models may also be implemented in conjunction with centralized wastewater treatment and collection. It is important to note that the management program models are not intended to supersede existing federal, state, tribal, or

local laws and regulations, but rather to complement them in protecting public health and water quality.

To assist state, tribal, and local units of government in evaluating and upgrading their onsite and clustered (decentralized) wastewater management programs, a draft *Handbook for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems* (referred to as the Management Handbook) complements the Management Guidelines. The draft Management Handbook includes case studies and examples of materials used by communities that have implemented management programs effectively.

Substantial resources are available as well, including EPA's *Onsite Wastewater Treatment Systems Manual*, to assist regulatory agencies and communities in assessing the technical foundation of the elements and activities in their existing or considered management programs.

EXHIBIT F

Total Maximum Daily Load
James Island Creek Enterococcus Daily Loads for
Stations RT-052098, JIC1 and JIC2 in
Hydrologic Unit Codes
030502020202 and 030502010605



Prepared for
SCDHEC Bureau of Water



by
Banu Varlik
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Abstract

James Island Creek is located within City of Charleston and Town of James Island in Charleston County, South Carolina (SC). Total land area draining to James Island Creek is approximately 6.8 mi². Historically, there was one SC Department of Health and Environmental Control (DHEC) water quality monitoring station, RT-052098, which was monitored in 2005 for fecal coliform. Currently, there are two water quality monitoring stations, JIC1 and JIC2, monitored for enterococcus bacteria by the Charleston Waterkeeper.

For recreational use, if greater than 10% of the monthly geometric mean of available data collected during an assessment period exceeds the criterion, the station is included on South Carolina's 303(d) list. If there are not an adequate number of monthly samples to calculate a geometric mean, then the available sample results are only compared against the single sample maximum (SSM) criterion. If greater than 10% of these samples exceed this criterion then the station is included on South Carolina's 303(d) list due to recreational use. All three stations have been included in the EPA approved 2016 303(d) List and draft 2018 303(d) List of Impaired Waters for exceeding the water quality standard for enterococcus bacteria.

Existing conditions and percent reductions for James Island Creek were calculated using cumulative probability distributions. For stations JIC1 and JIC2, the percent reductions required to meet the SSM enterococcus water quality standard are 74% and 95%, the percent reductions to meet the geometric mean is 82% and 96%, respectively. For SCDOT, existing and future NPDES MS4 permittees, compliance with terms and conditions of their NPDES permit is effective implementation of Wasteload Allocation (WLA) to the Maximum Extent Practicable (MEP) and demonstrates consistency with the assumptions and requirements of the Total Maximum Daily Load (TMDL). For existing and future NPDES construction and industrial stormwater permittees, compliance with terms and conditions of its permit is effective implementation of the WLA. Required load reductions in the Load Allocation (LA) portion of this TMDL can be implemented through voluntary measures and are eligible for Clean Water Act (CWA) §319 grants.

The Department recognizes that adaptive management/implementation of these TMDLs might be needed to achieve the water quality standard and we are committed towards targeting the load reductions to improve water quality in James Island Creek watershed. As additional data and/or information become available, it may become necessary to revise and/or modify these TMDL targets accordingly.

Table Ab-1. TMDLs for James Island Creek watershed. Loads are expressed as most probable number (MPN) per 100 ml.

Station	90th %tile of Existing Load (MPN/100 ml)	TMDL ^{1,2} (MPN/100 ml)	WQ Target (MPN/100 ml)	Margin of Safety (MPN/100 ml)	WLA			LA % Reduction to Meet LA ⁶
					Continuous Sources ³ (MPN/100ml)	Non-Continuous Sources ^{4,6} (% Reduction)	Non-Continuous SCDOT ^{5,6} (% Reduction)	
JIC1	385	104	98.8	4.2	See Note Below	74%	74%	74%
JIC1	178	35	33.25	1.52	See Note Below	81%	81%	81%
JIC2	2090	104	98.8	4.2	See Note Below	95%	95%	95%
JIC2	769	35	33.25	1.52	See Note Below	96%	96%	96%

Table Notes:

1. TMDL is expressed as a concentration. If daily average tidal exchange estimates were available, this number could be converted to load in MPN/day by multiplying flow by concentration and a conversion factor.
2. SA water WQS = Not to exceed a geometric mean of 35/100 ml over a 30-day period; nor shall a single sample maximum exceed 104 MPN/100 ml
3. WLA is expressed as a daily maximum of 104 MPN/100 ml and a 30-day geometric mean of 35 MPN/100 ml. There are no continuous dischargers at this time. Future continuous discharges are required to meet the prescribed loading for the pollutant of concern. Loadings are developed based upon permitted flow and an allowable permitted maximum concentration of 104 MPN/100ml or 30-day geometric mean of 35 MPN/100 ml.
4. Percent reduction applies to all NPDES-permitted stormwater discharges, including current and future MS4, construction and industrial discharges covered under permits numbered SCS & SCR. Stormwater discharges are expressed as a percentage reduction due to the uncertain nature of stormwater discharge volumes and recurrence intervals. Stormwater discharges are required to meet percentage reduction or the existing instream standard for pollutant of concern in accordance with their NPDES Permit.

5. By implementing the best management practices that are prescribed in either the SCDOT annual SWMP or the SCDOT MS4 Permit to address Enterococcus, the SCDOT will comply with these TMDLs and its applicable WLA to the maximum extent practicable (MEP) as required by its MS4 permit.
6. Percent reduction applies to existing concentration.

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1.0 Introduction

The Federal Clean Water Act (CWA) directs each state to review the quality of its waters every two years to determine if water quality standards are being met. If it is determined that the water quality is not being met, the states are to list the impaired water bodies under §303(d) of the CWA. The area of interest defined in this document includes James Island Creek in Charleston County, South Carolina (Figure 1). South Carolina Department of Health and Environmental Control (SCDHEC) station RT-052098 and two stations monitored by Charleston Waterkeeper (CWK), JIC1 and JIC2, are considered impaired for recreational uses due to elevated *Enterococci* bacteria levels.

A Total Maximum Daily Load (TMDL) is a written plan and analysis to determine the maximum pollutant load a waterbody can receive and still meet applicable water quality standards. The TMDL process includes estimating pollutant contributions from all sources, linking pollutant sources to their impacts on water quality, allocation of pollutant concentrations to each source and establishment of control mechanisms to achieve water quality standards. All TMDLs include a wasteload allocation (WLA) for all National Pollutant Discharge Elimination System (NPDES) permitted discharges, a load allocation (LA) for all unregulated nonpoint sources, and an explicit and/or implicit margin of safety (MOS). TMDLs are required to be developed for each waterbody and pollutant combination on the States' §303(d) lists by 40 CFR 130.7. 2001.

1.1 Background

James Island Creek is in the Sea Islands/Coastal Marsh ecoregion of South Carolina within Charleston County. Generally, Sea Islands/Coastal Marsh ecoregions have the lowest elevations in South Carolina. Environment is highly dynamic and is affected by wind, ocean wave, and river flows. In these types of ecoregions slash pine, cabbage palmetto, red cedar, and live oaks forests are common. In the marshes saltgrass, rushes, and various cordgrasses are the dominant flora. Marshes are nursery grounds for shrimp, fish, crabs, and other species (Griffith, et al. 2002).

Between 2000 and 2010, some of the coastal counties in South Carolina, including Charleston County, has experienced rapid growth and population increases. From 2000 US Population Census to 2010 Census, Charleston County's population increased by 13% to 350,209 and total population for South Carolina increased by 15.3% to 4,625,384 (U.S. Census Bureau 2012). This population growth trend in coastal regions is expected to increase, not just in South Carolina, but also in Georgia and North Carolina as well. The population increase along with development is already impacting coastal resources and

watersheds. Impacts of rapid and often loosely managed growth can drastically alter the quality of life of people living in the Southeast (DeVoe and Kleppel 2006).

Genus *Enterococci* are Gram-positive cocci common in the feces of warm-blooded animals which includes humans. Starting in 1986, US Environmental Protection Agency (EPA) has recommended using *Enterococci* as the indicator organism for fecal contamination and health risk in marine waters (US EPA 1986).

Sources of bacteria are commonly diffuse or nonpoint in nature and may originate from stormwater runoff, failing septic systems, agricultural runoff, leaking sewers, wildlife, pets, birds, etc. Occasionally, the source of the pollutant is a point source, such as wastewater treatment plants, MS4s, etc.

Section §303(d) of the Federal Clean Water Act (CWA) and *Water Quality Planning and Management* Regulations (40 CFR 130.7. 2001) require states to develop TMDLs for water bodies that are not meeting designated uses under technology-based pollution controls. The TMDL process establishes the allowable contribution of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and in stream water quality conditions so that states can establish water quality-based controls to reduce pollution and restore and maintain the quality of water resources (US EPA 1991).

Table 1. SCDHEC and Charleston Waterkeeper monitoring stations and their location descriptions.

Water Quality Monitoring Stations	Station Descriptions
RT-052098	James Island Creek North of White Hall Plantation
JIC1	James Island Creek 1 – South Side, Center of Harbor View Rd. Bridge
JIC2	James Island Creek 2 – End of Oak Point Drive Dock (Private Access)

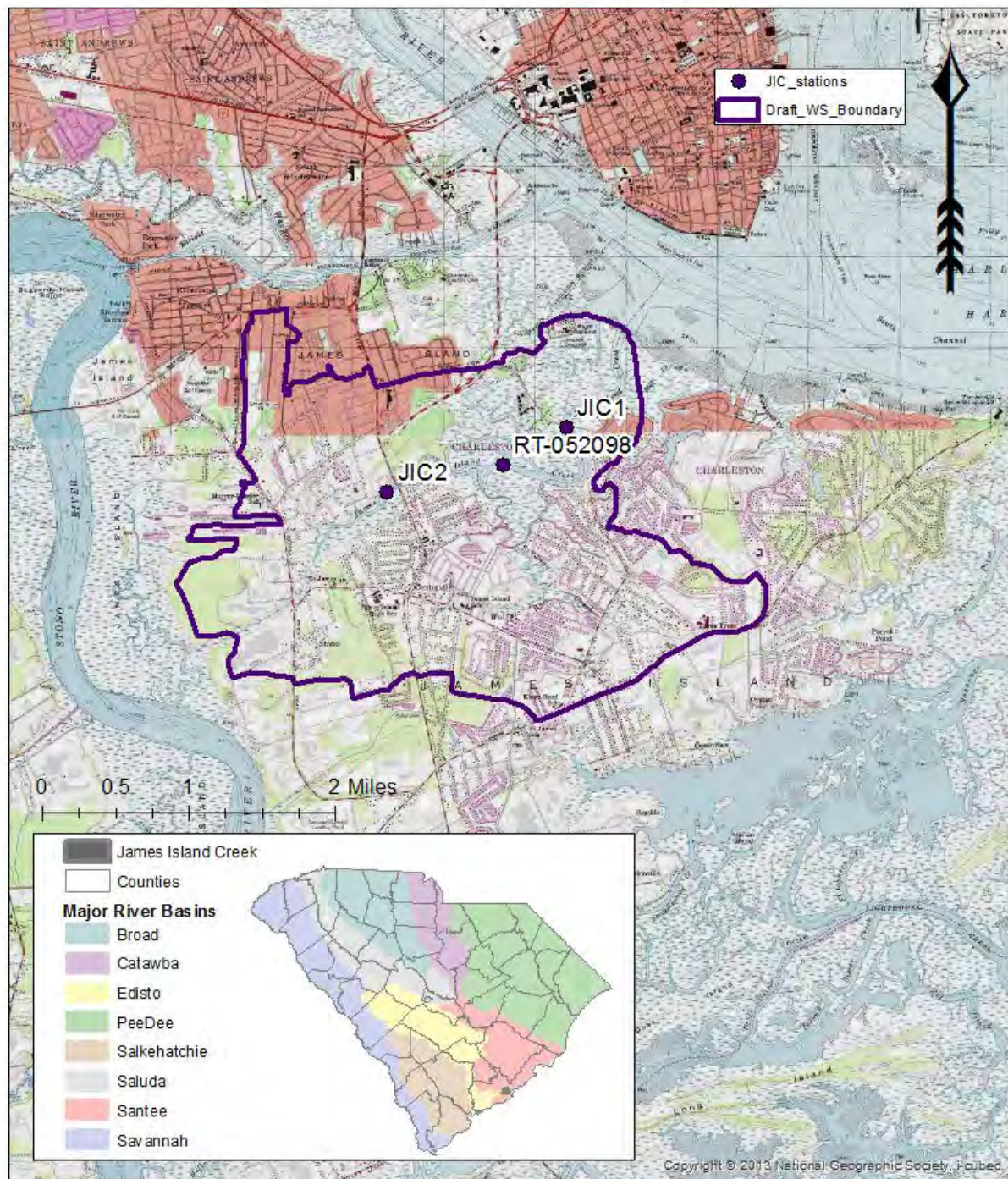


Figure 1. James Island Creek water quality monitoring stations and watershed boundary.

The State of South Carolina has included three monitoring stations in James Island Creek on South Carolina's EPA approved 2016 §303(d) List and draft 2018 303(d) List of Impaired Waters (SC DHEC, 2016) for recreational uses due to exceedances of *Enterococci* bacteria. Because the sites are impaired, a TMDL must be developed for the pollutant of concern.

The goal of this project will be to determine what and where the sources for *Enterococci* potentially are and calculate reductions that will meet the applicable water quality standard.

All three stations covered in this TMDL document are identified and shown on Figure 1 and Table 1.

1.2 Watershed Description

James Island Creek TMDL watershed is in Town of James Island and City of Charleston in Charleston County, South Carolina. The TMDL watershed is encompassed within two 12-digit hydrologic unit codes (HUC) 030502010605 which is the Lower Ashley River portion of the larger Santee River basin, and 030502020202 which is the Stono River-Atlantic Intracoastal Waterway.

James Island Creek watershed was delineated in collaboration with City of Charleston, Town of James Island, Charleston County, and with input from Charleston Waterkeeper. A draft watershed boundary was identified by the department based on topography, digital elevation models (DEM), satellite imagery, various GIS layers provided by the MS4s, such as outfall locations, in the watershed. Areas with questionable flow patterns were ground truthed during site visits, and the City of Charleston stormwater manager and the City's GIS group helped refine the final watershed boundary based on local data. Concurrence on the final watershed boundary was sought and received from all MS4s and the waterkeeper. Finalized watershed boundary has a drainage area of 6.8 mi² and is shown on Figure 1.

James Island Creek is an urban tidal stream situated to the southwest of Charleston Harbor, SC. Creek is approximately 600 feet wide at its entrance from Charleston Harbor and tapers to less than 1 foot near James Island County Park, with an average tidal range of approximately 5 feet.

Currently, there are two active stations in James Island Creek that are being monitored by Charleston Waterkeeper. Station JIC1 is sampled from south side of Harbor View Road, where the creek is approximately 400 feet wide and approximately 0.9 miles upstream from the confluence with Charleston Harbor (Figure 2). From June 2013 to October 2018, there were 143 samples collected and analyzed from this station, where 57% of the samples exceeded SSM WQS of 104 MPN/100 ml, while 96% of the samples exceeded the calculated geometric mean WQS of 35 MPN/100 ml. Sample range is 10 – 2489 MPN/100 ml.



Figure 2. North side of Harbor View Road, vicinity of station JIC1, where is creek is named as James Island Creek.

Station JIC2 is sampled from a private dock upstream from Folly Road. At this location, depending on tidal stage, the creek is approximately 80 feet wide and is 2.9 miles upstream from confluence with Charleston Harbor (Figure 3). During the same sampling period, 2013-2018, 142 samples were collected and analyzed from this station. Of the 142 samples collected and analyzed from JIC2, 88% of the samples exceed the WQS of 104 MPN/100 ml, while calculated geometric mean was exceeded 100% of the time. Samples range was 10 – 24196 MPN/100 ml.



Figure 3. Downstream of Folly Road, vicinity of station JIC2, where the creek is named as Ellis Creek.

United States Geological Survey topographic maps labels the creek as “James Island Creek” in its entirety but the creek is also known as Ellis and Newtown Cut creeks by the residents. Over Harbor View Road it is “James Island Creek” (Figure 2) and over Folly Road “Ellis Creek” (Figure 3). Portion of the creek to the southwest of Riverland Drive towards Stono River is named as Newtown Cut Creek (Bostick 2018). This TMDL document will refer to this waterbody as “James Island Creek”.

Based on historical accounts by Douglas Bostick (Personal communication, 2018), during colonial times James Island Creek was a connector creek between Stono River and Charleston Harbor. Per Mr. Bostick, the creek was navigable and used for ferrying farm goods from Johns Island to Charleston.

To determine current connectivity status of the creek between the Stono River and Charleston Harbor, two drone missions were flown on January 25, 2018. Both flights were flown off of James Island Parkway before entrance to James Island County Park. In this

vicinity, the creek is known as Newtown Cut. First flight was flown in the morning during slack low tide conditions. The purpose of the low tide flight was to determine if there is a clear, visible channel indicating James Island Creek is connecting Charleston Harbor and the Stono River.

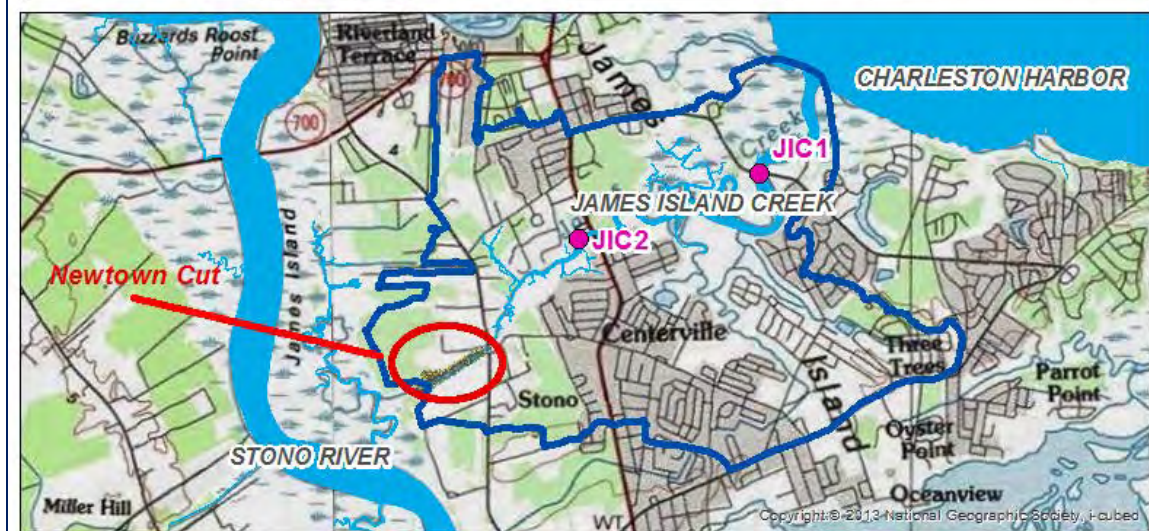


Figure 4. Map on the bottom shows the James Island Creek and its watershed boundary. Orthomosaic image at the top shows Newtown Cut portion of James Island Creek, to the southeast of the James Island County Park.

Based on orthomosaiced imagery, Figure 4, Newtown Cut and James Island/Ellis Creek channels are visible during low tide. However, there is not a clear, incised channel connecting Newtown Cut and James Island/Ellis Creek (Please see the area within the red rectangle on Figure 4. Therefore, it can be concluded that, under current conditions, Stono River and Charleston Harbor are not connected. The second mission was flown in the afternoon, during slack high tide conditions to determine whether water was flowing through the creek and connecting the Harbor and the Stono River. However, due to gusting winds, reduced flight altitude of the drone, and due to flight activity at the nearby Charleston Executive Airport, the mission was aborted, and results were inconclusive.

1.2 Landuse

Landuse within James Island Creek TMDL area was calculated using National Land Cover Database (NLCD) 2011 (Homer, et al. 2015). The results based on landuse characteristics are summarized on Table 2. Figure 6 shows the NLCD 2011 landuse within James Island Creek watershed. Based on NLCD 2011, primary landuse within the TMDL area is urban (3.3 mi²) followed by forested and non-forested wetlands (1.8 mi²). Based on NLCD 2011, the James Island Creek watershed is 47.7% developed and 12.2% impervious.

Table 2. James Island Creek landuse based on NLCD 2011

Landuse	Area (mi ²)	Percent of Area (%)
Open Water	0.1	2.1
Urban	3.3	47.7
Barren	0.01	0.1
Forest	1.6	22.9
Pasture/Hay	0.1	1.5
Forested and non-forested Wetlands	1.8	25.7
Total	6.8 mi ²	100%

1.4 Water Quality Standard

James Island Creek is classified as Class SA waters in SC Regulation 61-69 (SC DHEC 2014). Class SA waters are defined in SC Regulation 61-68 (SC DHEC 2014) as:

“Class SA are tidal saltwaters suitable for primary and secondary contact recreation, crabbing, and fishing, except harvesting of clams, mussels, or oysters for market purposes

or human consumption and uses listed in Class SB. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.”

Enterococci standard for Class SA waters (SC DHEC 2014):

“Not to exceed a geometric mean of 35/100 ml based on at least four samples collected from a given sampling site over a 30-day period; nor shall a single sample maximum exceed 104/100 ml. Additionally, for beach monitoring and notification activities for CWA Section 406 only, samples shall not exceed a single sample maximum of 104/100 ml.”

2.0 Water Quality Assessment

In 1986, the USEPA documented that *E. coli* and *Enterococci* bacteria are better indicators than FC bacteria group in predicting the presence of human gastroenteritis (upset stomach, nausea, diarrhea, vomiting) causing pathogenic bacteria in fresh and marine recreational waters. The USEPA study was based on data collected when swimmers were directly exposed in freshwater lakes with established public swimming areas. In almost all cases of water-borne illnesses, pathogens come from inadequately treated waste of humans or other warm-blooded animals. Also, *Enterococci* and *E. coli* are more specific to sewage and fecal sources than the FC bacteria group. In light of this information, USEPA has recommended the use of *E. coli* for fresh waters and *Enterococci* for marine water as the pathogen indicators.

In order to determine which pathogen indicator bacteria is better suited in South Carolina as the recreational use water quality standard in fresh and salt waters, the SCDHEC designed, and conducted a Pathogen Indicator Study (PIS) during 2009. Weekly water samples were collected from 73 stations statewide and analyzed for *E. coli*, *Enterococci* and for FC bacteria group. PIS results showed *Enterococci* is a better indicator for predicting the presence of pathogens and assessing recreational uses in South Carolina salt waters.

During 2012 and following the public participation, public comment period and legislative processes, the SDHEC submitted a proposed amendment to EPA to change the pathogen indicator from FC bacteria to *Enterococci* in R. 61-68. The proposed amendment was approved by the USEPA on February 28, 2013 and *Enterococci* has been promulgated in R. 61-68. *Enterococci* is the applicable water quality standard indicator for recreational use in salt waters.

Charleston Waterkeeper (CWK), based in Charleston, South Carolina is an organization whose mission is “to protect, promote, and restore the quality of Charleston’s waterways...” (<http://charlestonwaterkeeper.org/>). The organization has a DHEC approved Quality

Assurance Project Plan (QAPP) and has been collecting water samples since 2013. Weekly water samples are collected May through October, from approximately 15 stations from recreational marine waters around Charleston. Samples are collected from each station in pre-sterilized 120 ml bottles (Figure 5). Samples are analyzed for Enterococci according to Enterolert assay (Figure 7).

Locations sampled by the CWK include waters with heavy recreational uses such as swimming, kayaking, stand-up paddling, canoeing, etc. James Island Creek is one of the tidal streams monitored by the Waterkeeper. The Waterkeeper collects samples from two stations within James Island Creek which are identified in Table 1. Data collected by the Waterkeeper is available through their website, available at: <http://charlestonwaterkeeper.org/what-we-do/programs/water-quality-monitoring/>



Image, courtesy of Cheryl Carmack, Charleston Waterkeeper.

Figure 5. August 30, 2017 sample collected by Cheryl Carmack from station JIC2.

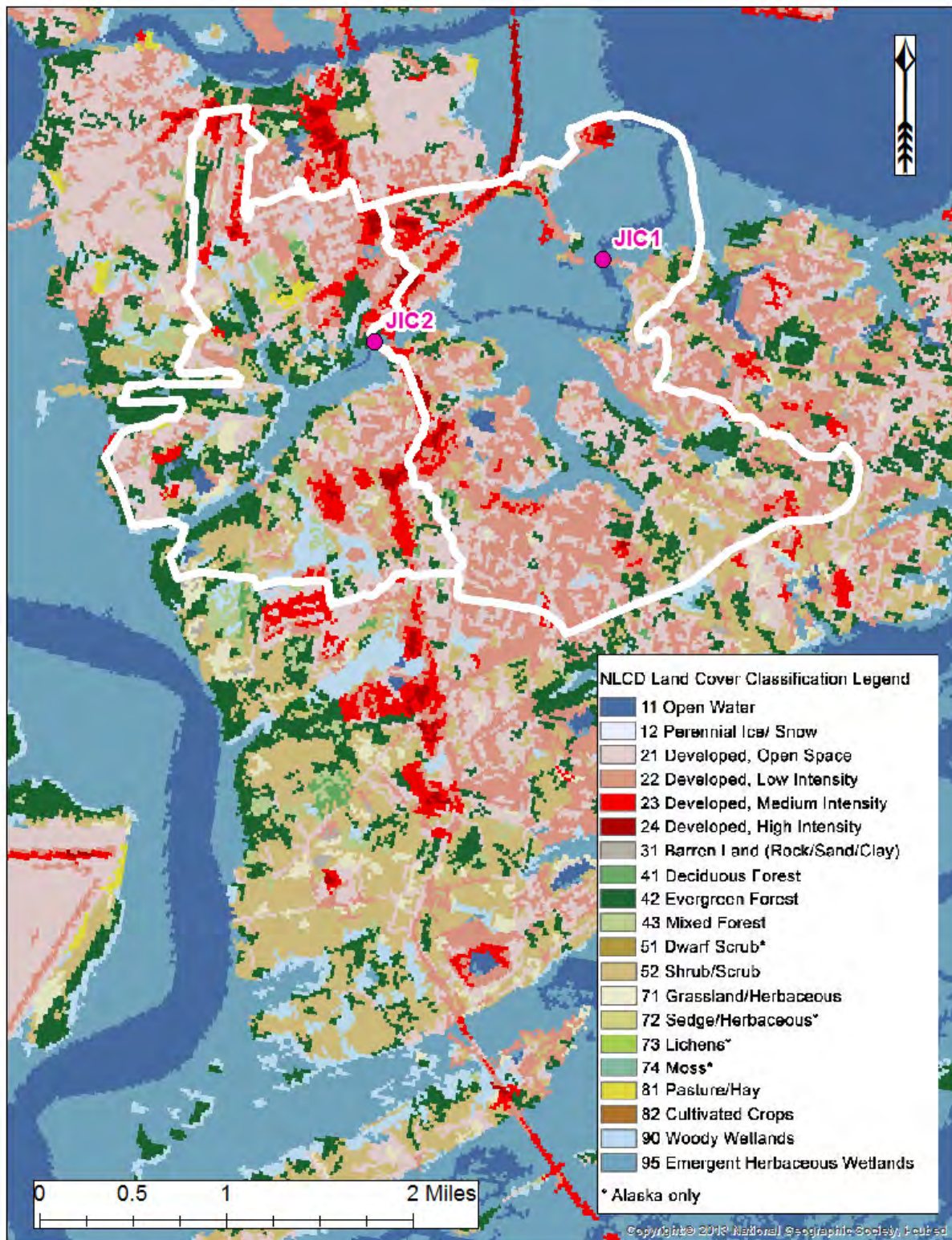
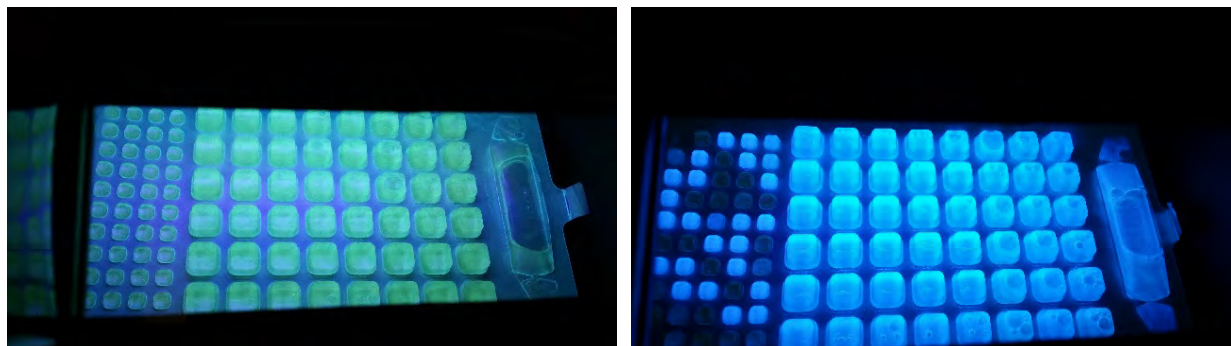


Figure 6. Landuse characteristics of James Island Creek watershed and the surrounding area.

3.0 Source Assessment

Pathogens, which are usually difficult to detect, cause disease and make full body contact recreation in lakes, streams a risk to public health. Indicators such as FC bacteria, *Enterococci*, or *E. coli* are easier to measure, have similar sources as pathogens, and persist in surface waters for a similar or longer length of time. These bacteria are not in themselves disease causing but indicate the potential presence of organisms that may result in sickness.



Image, courtesy of Cheryl Carmack, Charleston Waterkeeper.

Figure 7. Results of sample collected from JIC2 on August 30, 2017 (Figure 5) is shown on the right. The analysis results indicated there were 7270 MPN/100 ml *Enterococcus* in the sample. On the left is the "blank control" tray with 0 MPN/100 ml.

There are many sources of pathogen pollution in surface waters. These sources may be classified as point and nonpoint sources. Point sources are generally defined as pollutant loads discharged at a specific location from pipes, outfalls, ditches and conveyance channels from either municipal wastewater treatment plants, industrial waste treatment facilities or MS4s. Nonpoint source pollution originates from multiple sources that are unregulated over a relatively large area. Nonpoint sources can be divided in source activities related either to land or water use and include failing septic tanks, improper animal keeping practices, forestry practices, as well as urban and rural runoff. With the implementation of technology-based controls, pollution from continuous point sources, such as factories and wastewater treatment facilities, has been greatly reduced. These point sources are required by the CWA to obtain a NPDES permit. In South Carolina NPDES permits require that dischargers of sanitary wastewater must meet the state standard for *Enterococcus* at the point of discharge.

Non-continuous point sources required to obtain NPDES permits include stormwater discharges from municipal separate storm sewer systems (MS4s), industrial activities and construction sites. Each may be a source of pathogens. These sources are expected to meet the percentage reductions as prescribed in this TMDL or the existing instream

standard for the pollutant(s) of concern through compliance with the terms and conditions of their permit.

3.1 Point Sources

3.1.1 Continuous Point Sources

Municipal and private sanitary wastewater treatment facilities may be sources of pathogens or *Enterococci* bacteria when not meeting limits for *Enterococci* bacteria. However, if these facilities are discharging wastewater that meets their permit limits, they are not causing or contributing to impairment provided that a daily maximum limit is being met as specified in the TMDL. If any of these facilities are not meeting their permit limits, enforcement actions/mechanisms are in place.

Currently, there are no continuous NPDES-permitted discharges to James Island Creek with an *Enterococci* effluent limit on their NPDES permit. Future NPDES dischargers of enterococcus in James Island Creek watershed are required to comply with the load reductions prescribed in the WLA and demonstrate consistency with the assumptions and requirements of the TMDL.

3.1.2 Non-Continuous Point Sources

Non-continuous point sources include all NPDES-permitted stormwater discharges, including current and future MS4s, construction and industrial discharges covered under permits numbered SCS and SCR and/or regulated under *South Carolina Water Pollution Control Permits: R.61-9, §122.26(b)(4),(7),(14) - (21)* (SC DHEC 2011). All regulated MS4 entities have the potential to contribute to *Enterococci* pollutant loading in the delineated drainage area used in the development of this TMDL.

The South Carolina Department of Transportation (SCDOT) is a designated MS4 within James Island Creek watershed. The SCDOT operates under NPDES MS4 Permit SCS040001 and owns and operates roads within the watershed. However, the Department recognizes that SCDOT is not a traditional MS4 in that it does not possess statutory taxing or enforcement powers. SCDOT does not regulate landuse or zoning, issue building or development permits.

Individual landuses for the two CWK stations included in this TMDL document were calculated utilizing NLCD 2011 and a Geographic Information System (GIS) tool and are summarized in by each landuse category. Total developed landuse for JIC1 and JIC2 is 46.3% and 49.9% of their total drainage area, respectively. Based on current GIS information

available at the time of TMDL development, there are no SCDOT facilities located within these referenced watersheds.

Other than SCDOT, there are three additional permitted stormwater systems in this watershed: Charleston County (SCR0319020), City of Charleston (SCR031901) and Town of James Island (SCR031910). Future permitted sanitary sewer or stormwater systems in the referenced watershed are required to comply with the load reductions prescribed in the WLA and demonstrate consistency with the assumptions and requirements of the TMDL.

Table 3, below, shows the total contributing areas (acres) of each MS4 within the James Island Creek watershed, which is 3795.2 acres, or 5.9 mi². Within James Island Creek TMDL watershed, there are areas without a designated MS4. Total area of James Island Creek TMDL watershed is 6.8 mi², compared to 5.9 mi² of designated MS4 areas (Figure 12).

Table 3. MS4s within James Island Creek TMDL watershed and their total contributing areas (ac) by station.

	Charleston County acres	City of Charleston acres	Town of James Island acres	SC DOT acre
JIC1	54.9	1335.2	921.2	101.5
JIC2	240.5	754.9	285.8	101.2
Total	3795.2 ac (5.9 mi ²)			

Industrial facilities that have the potential to cause or contribute to a violation of a water quality standard are covered by the NPDES Storm Water Industrial General Permit (SCR000000). Construction activities are usually covered by the NPDES Storm Water Construction General Permit from SCDHEC (SCR100000). Where the construction has the potential to affect water quality of a water body with a TMDL, the Storm Water Pollution Prevention Plan (SWPPP) for the site must address any pollutants of concern and adhere to any waste load allocations in the TMDL. Note that there may be other stormwater discharges not covered under permits numbered SCS and SCR that occur in the referenced watershed. These activities are not subject to the WLA portion of the TMDL.

Similar to regulated MS4s, potentially designated MS4 entities or other unregulated MS4 communities located in these watersheds may have the potential to contribute *Enterococci* bacteria in stormwater runoff. These unregulated entities are subject to the LA for the purposes of these TMDLs.

Sanitary sewer overflows to surface waters have the potential to impact water quality. These untreated sanitary discharges may result in violations of the WQS. It is the responsibility of the NPDES wastewater discharger, or collection system operator for non-permitted 'collection only' systems, to ensure that releases do not occur. Unfortunately releases to surface waters from SSOs are not always preventable or reported. Based on the Department's record, there have not been any reported SSOs in James Island Creek watershed since December 29, 2011. SSOs in James Island Creek may be underreported.

On James Island, water and sewer utilities are not included under the same organization and customers are billed separately. In some cases, this situation can lead to disconnection of sewer service for nonpayment while water service continues as long as the water bill is current. When this happens, untreated sewage may be discharged directly to the land surface. This is a human health concern as well as an environmental issue and is a potential source of pollution to nearby waters.

The Department acknowledges that progress with the assumptions and requirements of the TMDL by MS4s is expected to take one or more permit iteration. Progress towards achieving the WLA reduction for the TMDL may constitute MS4 compliance with its SWMP, provided the Maximum Extent Practicable (MEP) definition is met, even where the numeric percent reduction may not be achieved in the interim.

3.2 Nonpoint Sources

Nonpoint source pollution is defined as pollution that is not released through pipes but rather originates from multiple sources over a relatively large area. Nonpoint sources can be divided into source activities related either to land or water use including failing septic tanks, improper animal-keeping practices, agriculture, forestry practices, wildlife and urban and rural runoff.

Nonpoint source pollution is a likely contributing factor to negatively impact water quality in these watersheds. The Department recognizes that there may be wildlife, agricultural activities, grazing animals, septic tanks, and/or other nonpoint source contributors located within unregulated areas (outside the permitted area) of James Island Creek watershed. Nonpoint sources located in unregulated areas are subject to the LA and not the WLA of the TMDL document.

3.2.1 Agricultural Activities

Agricultural activities that involve livestock or animal wastes are potential sources of bacterial contamination of surface waters. Fecal matter can enter the waterway via runoff from the land or by direct deposition into the stream. Owners/operators of most

commercial animal growing operations are required by R. 61-43, Standards for the Permitting of Agricultural Animal Facilities, to obtain permits for the handling, storage, treatment (if necessary) and disposal of the manure, litter and dead animals generated at their facilities (SC DHEC 2002). The requirements of R. 61-43 are designed to protect water quality and there is a reasonable assurance that facilities operating in compliance with this regulation should not contribute to downstream water quality impairments. In addition to the state permit, animal operations that are considered Concentrated Animal Feeding Operations (CAFOs) are also required to have an NPDES Permit if they have a discharge to surface waters. There are no permitted CAFOs in South Carolina. Currently, there are no regulated agricultural operations within the TMDL watershed.

3.2.2 Land Application of Industrial, Domestic Sludge or Treated Wastewater

NPDES-permitted industrial and domestic wastewater treatment processes may generate solid waste bi-products, also known as sludge. In some cases, facilities may be permitted to land apply sludge at designated locations and under specific conditions. There are also some NPDES-permitted facilities authorized to land apply treated effluent at designated locations and under specific conditions. Land application permits for industrial and domestic wastewater facilities may be covered under SC Regulation 61-9 (SC DHEC 2011), Sections 503, 504, or 505.

It is recognized that there may be operating, regulated land application sites located in James Island Creek watershed. If properly managed, waste is applied at a rate that ensures pollutants will be incorporated into the soil or plants and pollutants will not enter streams. Land application sites can be a source of *Enterococcus* bacteria and stream impairment if not properly managed. Similar to AFO land application sites, the permitted land application sites described in this section are not allowed to directly discharge to James Island Creek. Direct discharges from land application sites to surface waters of the State are illegal and are subject to enforcement actions by the SCDHEC. Currently there are no NPDES permitted facilities with a land application permit of treated wastewater within James Island Creek watershed.

3.2.3 Urban and Suburban Stormwater Runoff

There are 'urban' wildlife such as resident waterfowl, squirrels, rodents, raccoons, geese and other birds, all of which can contribute to the bacteria load. Urban runoff is considered to be significant within James Island Creek TMDL watershed.

Other contributors to the *Enterococci* loading to streams, estuaries, and lakes are the household cats and dogs as well as other domesticated animals such as horses, chickens,

pigs and others. One study found cat feces can contain between 3.3×10^4 to 4.1×10^7 MPN/g (wet), and dog feces between 8.4×10^6 to 1.2×10^8 MPN/g (wet) of fecal indicator bacteria (Cox, et al., 2005). U.S. Pet Ownership Statistics show 28% of households' own dogs and 23% own cats (American Veterinary Medical Association, 2014). Based on the 2010 US Population Census, there are approximately 7961 households with a population of 15962 within James Island Creek watershed. Based on these statistics, there are approximately 3585 dogs and 3917 cats within James Island Creek TMDL watersheds. American Veterinary Medical Association Pet Ownership Calculator is available at: <https://www.avma.org/KB/Resources/Statistics/Pages/US-pet-ownership-calculator.aspx>

Similar to regulated MS4s, potentially designated MS4 entities as listed in FR 4, Appendix 7 (Federal Register 1999) or other unregulated MS4 communities located in James Island Creek watershed may have the potential to contribute bacteria in stormwater runoff.

3.2.4 Failing Septic Systems

Improperly maintained and failing septic tanks can contribute to bacterial contamination of downstream waterbodies. Untreated sewage from failing septic systems may have a potential to enter surface waters in this watershed. Although loading to streams from failing septic systems is likely to be a continual source, wet weather events can increase the rate of transport of effluent from failing septic systems.

A preliminary analysis was done, using older GIS data, to calculate the potential number of septic tanks within the James Island Creek watershed. Analysis results showed that close to 40% of the households were using septic tanks. Because this number seemed to be high, the MS4s and CWK has have requested from DHEC to calculate and determine the numbers as well as locations of septic tanks within the watershed.

An internal DHEC database of permitted septic tanks and addresses were obtained. The database consists of two separate date intervals:

- o Legacy data between 1969 and to the beginning of April 2006
- o Newer data starting with second week of April 2006 to February 1st, 2018

Three GIS layers were created using the DHEC database as well as the Charleston County parcel layers. Utilizing the septic database and county database, three shapefiles were created:

1. New Septics: 2013 to 2017. New permits have been issued from 2006 to 2012, however these new permitted septics are not within the JIC watershed.
2. Legacy Septics: 1969 to 2006

3. Pre- 1969

The pre-1969 layer was created using aerial imagery and street views from Google Earth and Bing Maps, main sewer lines, parcel data, and real estate websites such as Realtor.com and Zillow.com. Aerial imagery (Google Maps, Bing Maps) and their street views were used to look for visible signs of septic failure, such as visible drain lines, out of season lush green ground cover, etc. The real estate websites were also used to determine the approximate age of homes in older neighborhoods and whether there is information on septic or sewer service. In the case of lots for sale, same information was used to determine the availability of sewer service.

Results of this analysis is summarized on

Table 4, and locations are shown in Figure 10, below. Note that overall number of septic tanks within James Island Creek is approximately 860. However, when these approximate number of septic tanks are categorized by the responsible MS4s, the total number is greater than 860. This is due to some parcels straddling more than one MS4, therefore are being counted more than once. Based on the 2010 US Census results, there are approximately 7961 housing units with a population of 15,962. Of these housing units, approximately 10.8% are using septic tanks. Results of this analysis has been shared with the MS4s during the drafting phase of this document.

Table 4. Approximate number of septic tank currently in use, and their distribution by designated MS4, and overall James Island Creek watershed.

MS4	Area of MS4 mi ² (%)	Pre- 1969 # of Septic Tanks	1969-2007 # of Septic Tanks	2013-2017 # of Septic Tanks	Total # of Septic Tanks
Charleston County	0.5 (8.5)	186	7	2	195
City of Charleston	3.4 (57.6)	436	25	5	466
Town of James Island	2.0 (33.9)	377	47	8	432
James Island Creek Watershed		792	60	8	860

SCDOT is not a conventional MS4, therefor is not included in the table above.

3.2.5 Wildlife

Resident, migrant and seasonal wildlife' wastes that are carried into nearby streams by runoff following rainfall or deposited directly in or adjacent to streams may be a significant source of Enterococcus in James Island Creek watershed. SCDNR's 2013 deer density study indicate there are approximately 15 to 30 deer per square mile in the vicinity of James Island Creek TMDL area (SC DNR 2013). The study estimated deer density based on suitable habitat such as forests, croplands, and pastures. Data compiled by Yagow show the fecal indicator bacteria production can be 347×10^6 MPN/deer/day, 113×10^6 MPN/raccoon/day, and $4,853 \times 10^6$ MPN/duck/day (Yagow 2001).

3.2.6 Marinas, Boating Activities and Structures

Currently there are no marinas within James Island Creek watershed however there are numerous private docks along the Creek.

There are 3 main types of marine sanitation devices (MSD) that are suitable for different kinds of marine vessels and have varying effluent treatment levels. Every vessel with an MSD installed as of January 30, 1980 must be equipped with one of the three types of MSDs (United States Code 2012). Properly-maintained MSDs should not be causing or contributing to bacteria exceedances in James Island Creek. It is prohibited under Federal law to discharge untreated sewer from vessels within navigable waters as stated in Clean Vessel Act.

3.2.7 Summary of Potential Sources of Bacteria in James Island Creek Watershed

There are many sources of bacteria and numerous paths of entry into the waterways. Some of these sources and pathways are:

1. Malfunctioning septic tanks
2. Homeless camp located near the intersection of Folly and Oak Point roads
3. Pet Waste
4. Sanitary sewer overflows
5. Utility disconnecting sewer lines
6. Stormwater runoff
7. Illicit discharges

Enterococci SSM (104/100 ml) results from stations JIC1 and JIC2 were compared to cumulative 24, 48, 72, 96-hour precipitation to determine under which conditions WQS was meeting or exceeding. CWK collects samples on Wednesdays, May through October.

Interpolated precipitation data for each station was obtained from PRISM Climate Group (<http://prism.oregonstate.edu/>), and cumulative totals were calculated for both stations.

Cumulative 24-hour precipitation represents total amount of rain that fell over the area draining to a station from 8 am Tuesday morning to 8 am Wednesday morning which is the sampling day. Similarly, 48-hour total precipitation would be from 8 am Monday morning to 8 am Wednesday morning.

Majority of the samples collected from JIC1 are meeting the WQS when there has not been any precipitation for 24, 48, and 72-hours (dry conditions), while exceeding the WQS after 96-hours of cumulative precipitation. As mentioned above, in the vicinity of station JIC1, width of the creek is approximately 400 ft, 0.9 miles upstream from Charleston Harbor, and has large expanse of marsh area to the south, west, and north of the station (Figure 8). These conditions are suitable to provide tidal exchange due to the width of creek and proximity to Charleston Harbor, as well as pollutant filtering by the surrounding marshes.

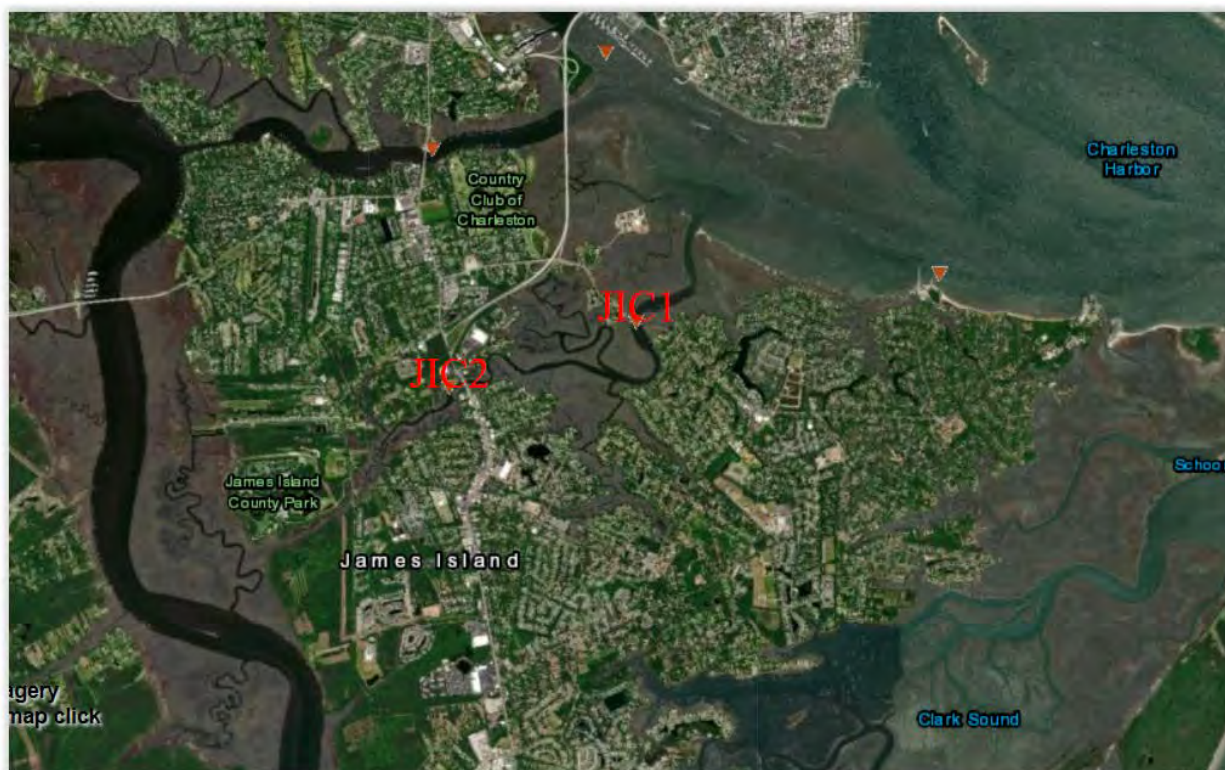


Figure 8. Locations of stations JIC1 and JIC2.

Enterococcus sample results collected from JIC2 were analyzed using the same cumulative precipitation intervals, 24, 48, 72, and 96-hours. Analysis results show station JIC2 is not meeting the WQS when there has been no precipitation for up to 72-hours, dry conditions. As previously mentioned, creek is narrower and approximately 2.9 miles upstream from

Charleston Harbor. This may be an indication of constant sources of bacteria entering this portion of James Island Creek during dry conditions, limited tidal exchange, and developed landuse. Analysis results for both stations are summarized on

Table 5.

Table 5. Comparison of total precipitation with bacteria sampling results from stations JIC1 and JIC2 (2013-2018).

JIC1 n=142	Zero precipitation: # of samples (%) meeting WQ	Zero precipitation: # of samples (%) not meeting WQ	0.11 to 10.8 inches of precipitation: # of samples (%) meeting WQ	0.11 to 10.8 inches of precipitation: # of samples (%) not meeting WQ
24 hours	71 (50%)	41 (28.9%)	10 (7%)	20 (14.1%)
48 hours	60 (42.3%)	28 (19.7%)	21 (14.8%)	33 (23.2%)
72 hours	52 (36.6%)	25 (17.6%)	29 (20.4%)	36 (25.4%)
96 hours	39 (27.5%)	15 (10.6%)	42 (29.6%)	46 (32.4%)

JIC2 n=142	Zero precipitation: # of samples (%) meeting WQ	Zero precipitation: # of samples (%) not meeting WQ	0.11 to 10.8 inches of precipitation: # of samples (%) meeting WQ	0.11 to 10.8 inches of precipitation: # of samples (%) not meeting WQ
24 hours	17 (12%)	95 (66.9%)	0 (0%)	30 (21.1%)
48 hours	16 (11.3%)	72 (50.7%)	1 (0.7%)	53 (37.3%)
72 hours	14 (9.8%)	63 (44.4%)	3 (2.1%)	62 (43.7%)
96 hours	12 (8.5%)	43 (30.3%)	5 (3.5%)	82 (57.7%)

4.0 Cumulative Probability Method

Cumulative probability distributions were used to calculate existing conditions and percent reductions necessary to meet recreational saltwater water quality standards for enterococcus in James Island Creek TMDL watershed. For the calculations of the cumulative probability distributions, data collected by Charleston Waterkeeper from 2013 through 2017 were used. DHEC station RS-052098, a statistical survey or random sampling site, was sampled for fecal coliform for one year during 2005. Because enterococcus is the applicable recreational use water quality indicator and more recent data have been collected at JIC1 and JIC2 in the watershed, the Department believes that the historical fecal coliform data collected at RT-052098 are less representative of current condition in the watershed. The calculated reductions for JIC1 and JIC2 are expected to address the current recreational use water quality standard at RT-052098.

For the calculations of the cumulative probability distributions, data collected by Charleston Waterkeeper from 2013 through 2018 were used. Enterococcus results for stations JIC1 and JIC2 were separated into Excel spreadsheets, and were sorted by date, older to newer, from 2013 to 2018. Geometric mean of first 30-days of Enterococcus data from 2013 was calculated. Then, geometric mean of the next 30-days of data were calculated, and continued calculations for 2013. Same procedure was repeated for each station and year. An example calculation is shown on Figure 9.

After the calculations, cumulative probabilities for each station was plotted using Cumulative Probability Plot 3.0 (Tuttle, Oliver and McGinnis 2003). Log transformed geometric means are copied into the program. The program sorts the log transformed data in ascending order to determine rank and then assigns a probability plotting position using the following function:

$$p(\%) = \frac{100M}{N+1}$$

where, M = rank and N = number of samples (Novotny, 2004).

In this case, the log base 10 of Enterococci is used. If the data follows a log-normal distribution, the data points on the plot will approximate a straight line (the normal distribution). This straight line is then compared to the water quality standard at the appropriate percentile.

For Class SA waters in South Carolina, the TMDL target equates to a geometric mean of 35 MPN/100 ml minus a 5% margin of safety (33.25 MPN/100ml), and SSM of 104 MPN/100ml minus a 5% margin of safety (98.8 MPN/100ml) at the 90th percentile. If the fit line crosses the 90th percentile reference line above the standard, the site is considered to not meet the standard for geometric means and SSMs. If the line crosses below the standard reference the site does meet the water quality standard. If the data does not meet the geometric mean or the single sample standard, a line is drawn parallel to the original normal distribution line that intersects the standard at the 90th percentile point. Drawing the line parallel to the original distribution assumes that the coefficient of variation remains the same for the original data and the desired water quality data (Novotny, 2004). The necessary percent reduction is calculated as the difference between the distributions at the 90th percentile point:

$$\frac{\text{Existing Load} - (\text{Standard} - \text{MOS})}{\text{Existing Load}} * 100$$

Station	2013 Date	Result	Geomean
JIC2	7/10	1014	Data on the left column was used to calculate geometric mean shown below
JIC2	7/17	538	
JIC2	7/24	171	
JIC2	7/31	616	
JIC2	8/7	94	
	1 st 30-day period (above)		351.97
JIC2	8/14	370	Data on the left column was used to calculate geometric mean shown below
JIC2	8/21	168	
JIC2	8/28	440	
JIC2	9/4	500	
JIC2	9/11	540	
	2 nd 30-day period (above)		374.68
JIC2	9/18	160	Data on the left column was used to calculate geometric mean shown below
JIC2	9/25	909	
JIC2	10/2	299	
JIC2	10/9	633	
JIC2	10/16	317	
	3 rd 30-day period (above)		387.40
JIC2	10/23	573	Data not used
JIC2	10/30	990	Data not used

Figure 9. Example of data used for calculating the Enterococcus geometric means for 2013. **Bold** indicates geometric mean is exceeding the water quality standard.

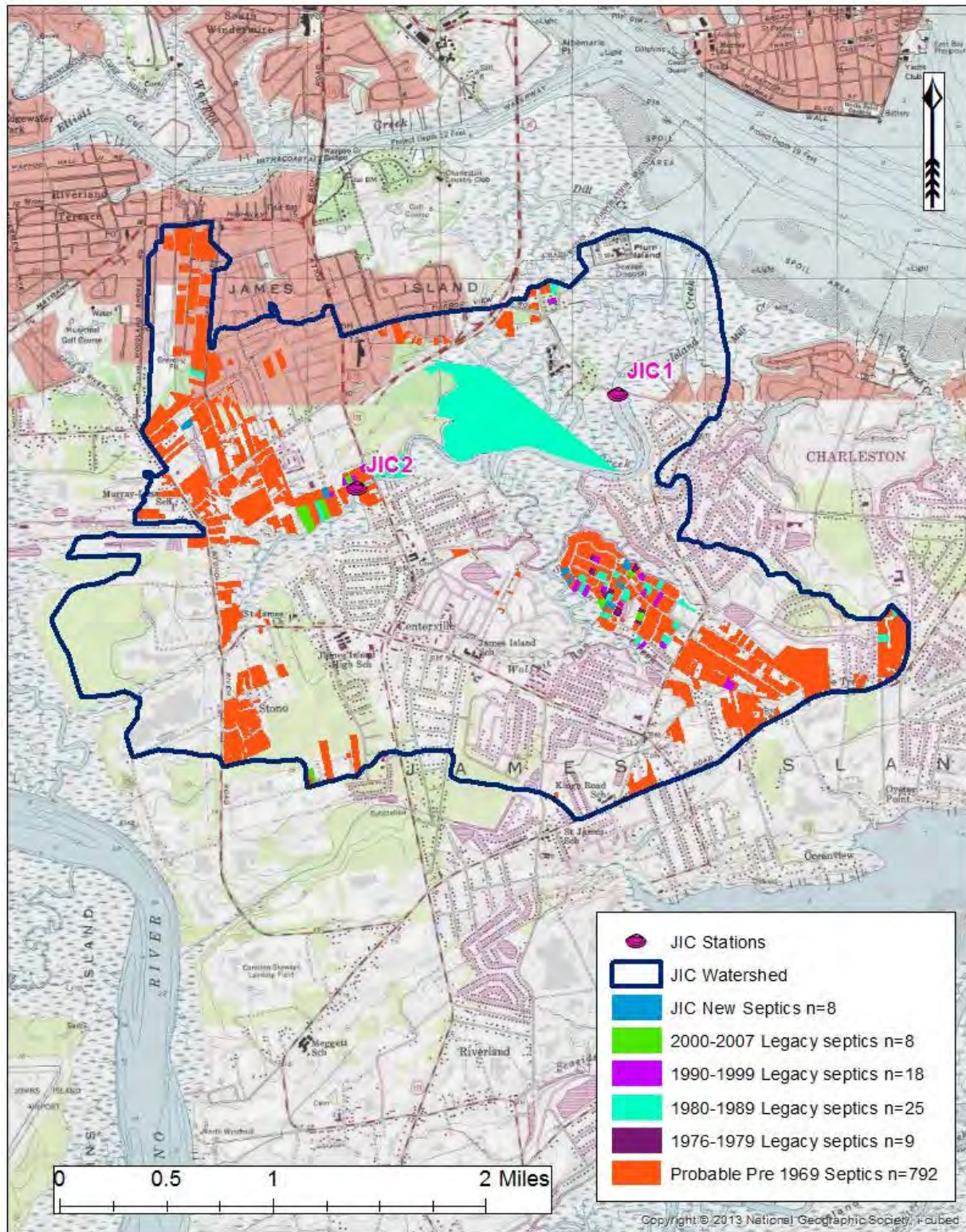
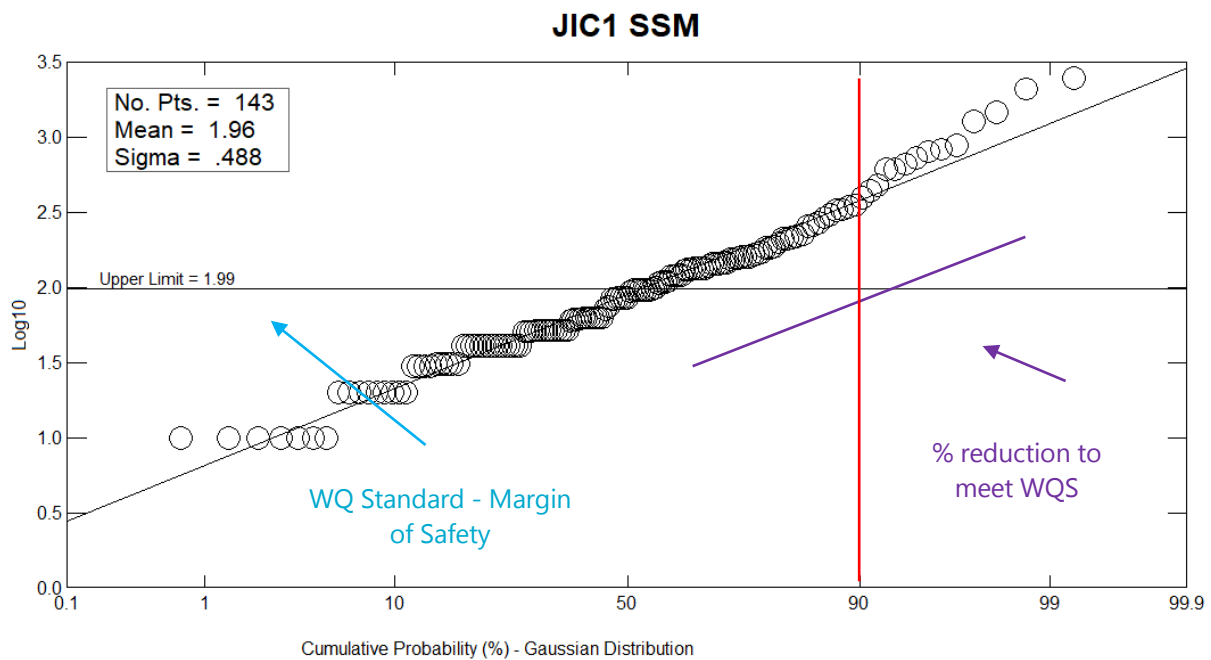
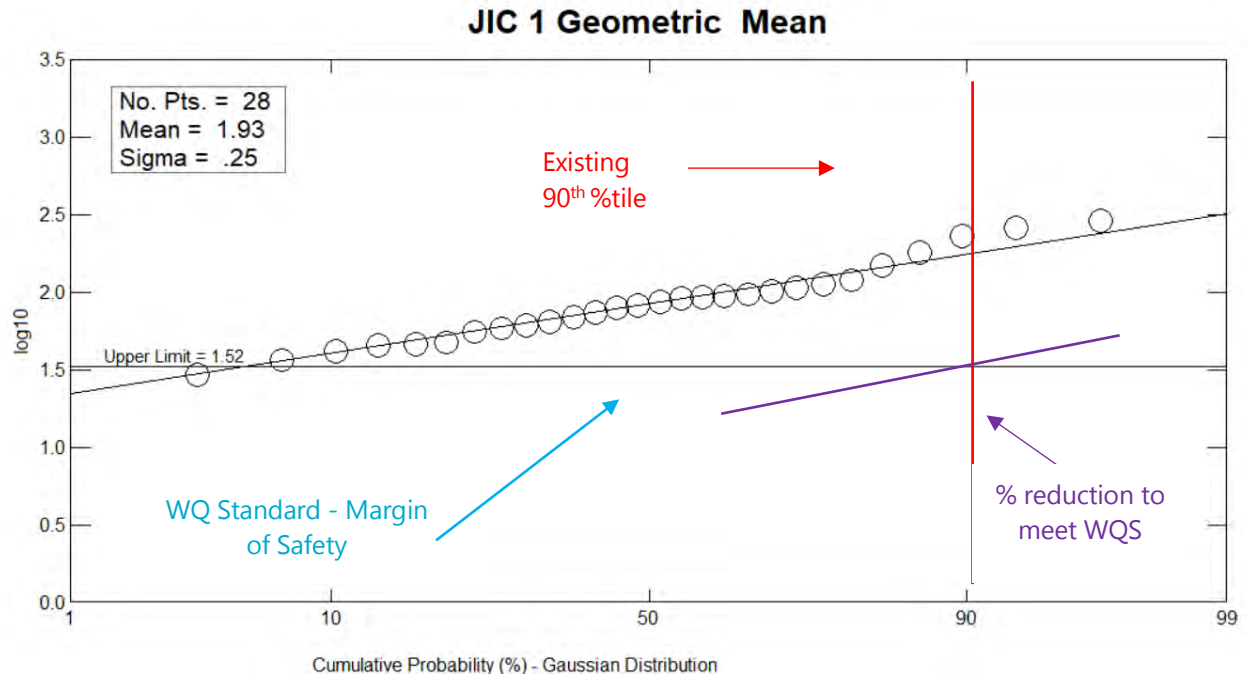


Figure 10. Locations of potential septic tanks within James Island Creek watershed, sub divided by installation date.

There are no stations that currently exceed the geometric mean criteria that do not also exceed the single standard sample. Figure 11. Geometric mean and SSM cumulative probability graphs for stations JIC1 and JIC2.

shows the geometric mean and SSM cumulative probability graph for stations JIC1 and JIC2.

If sufficient approximations of tidal exchange and flow patterns were available, this method could be extended to calculate the total maximum daily *Enterococci* loading in MPN/day for locations within the watershed. Average daily tidal exchange would be multiplied by the water quality standard of 104 MPN/100ml and a conversion factor. This number would represent the maximum daily load for all waters within the delineated watershed, whether impaired or not. There is not sufficient data to calculate the loadings for each station which is a limitation of this method.



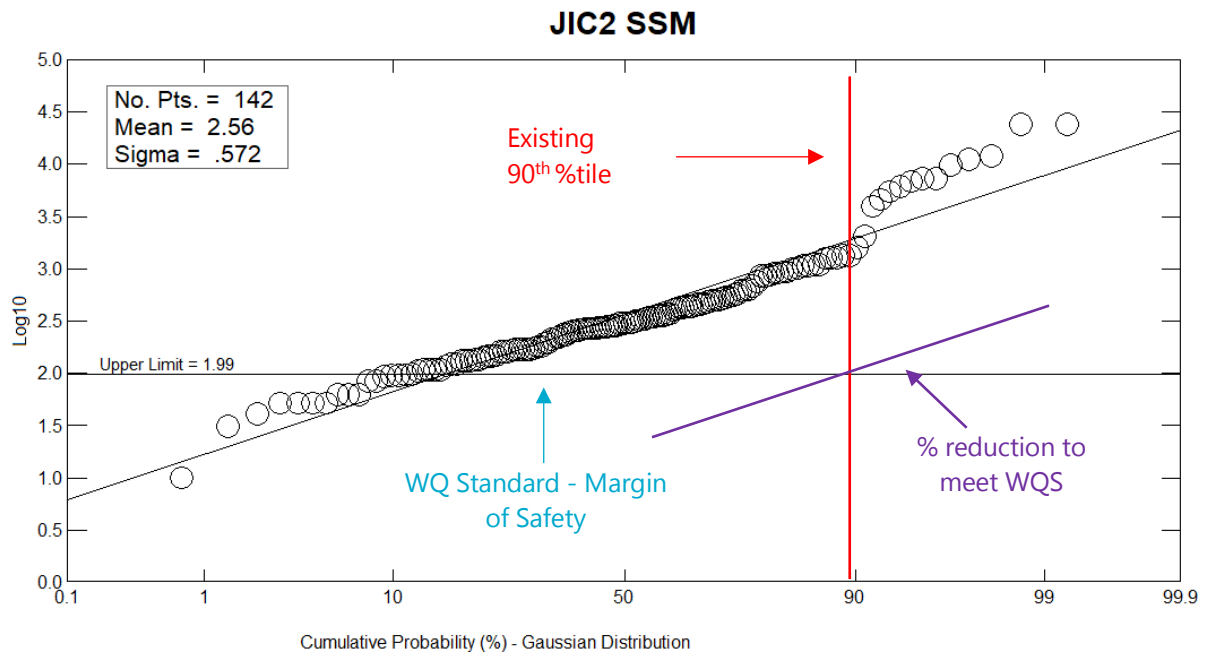
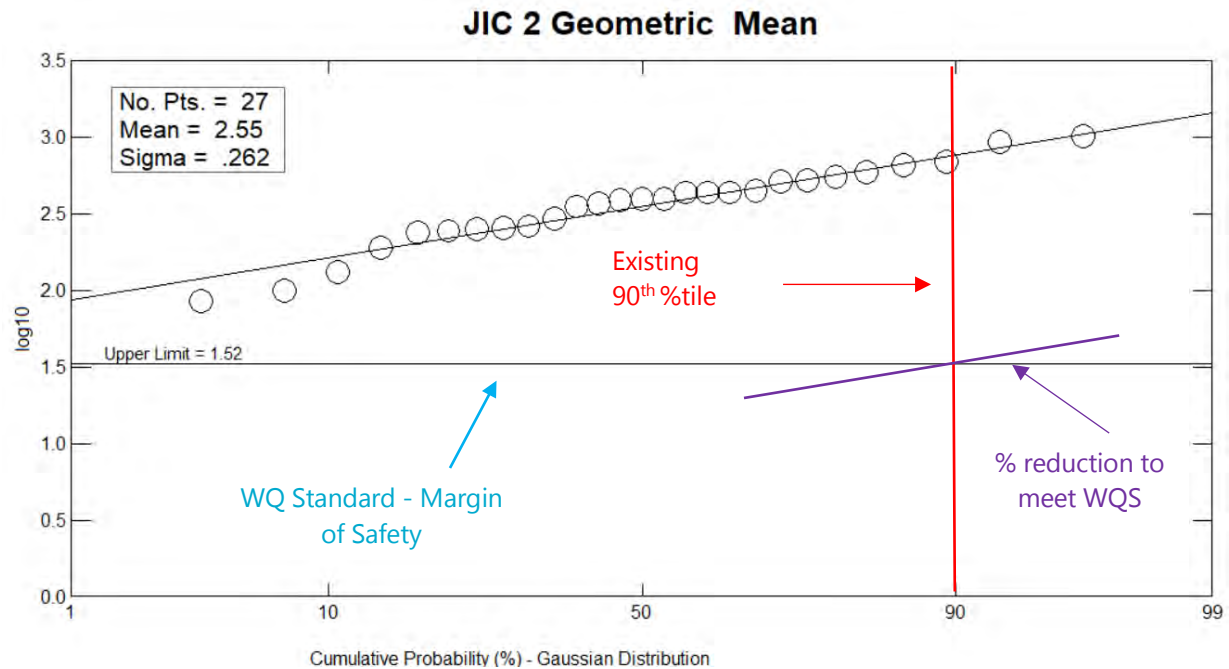


Figure 11. Geometric mean and SSM cumulative probability graphs for stations JIC1 and JIC2.

5.0 Development of the TMDLs

A total maximum daily load (TMDL) for a given pollutant and water body is comprised of the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving water body. Conceptually, this definition is represented by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while still achieving compliance with WQS. In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established and thereby provide the basis to establish water quality-based controls.

For most pollutants, TMDLs are expressed as a mass load (e.g., kilograms per day). For bacteria, however, TMDLs are expressed in terms of number (#), colony forming units (cfu), organism counts (or resulting concentration), or MPN (Most Probable Number), in accordance with 40 CFR 130.2(l).

5.1 Applicable Water Quality Standards

James Island Creek is classified as Class SA tidal waters. In Regulation 61-68, enterococci water quality standard for SA waters is as follows: "Not to exceed a geometric mean of 35/100 ml based on at least four samples collected from a given sampling site over a 30 day period; nor shall a single sample maximum exceed 104/100 ml. Additionally, for beach monitoring and notification activities for CWA Section 406 only, samples shall not exceed a single sample maximum of 104/100 ml".

Percent reductions applicable to stations JIC1 and JIC2 are summarized in Table 6 below. For station JIC1, there is an 8% difference between SSM and geometric mean criteria. Geometric mean and SSM percent reductions are essentially same for station JIC2.

As previously mentioned, the Charleston Waterkeeper has been collecting weekly samples during the months May through October since summer of 2013. In most cases, the Department does not have sufficient data to calculate geometric means and determine if a station is meeting the geometric mean criterion. Instead, TMDLs normally only target the SSM criterion.

In the case of James Island Creek, there are sufficient weekly samples collected to allow for geometric mean calculations. Table 7 in Section 5 includes TMDLs that address both the

SSM and geometric mean criteria. The percent reductions required to meet geometric mean TMDLs are higher than the percent reductions to meet the SSM TMDLs; therefore, the target percent reductions for James Island Creek stations are based on meeting the geometric mean TMDLs.

James Island Creek must meet both enterococci criteria in order to attain water quality standards. It is expected that achieving the larger of the two percent reductions, and/or meeting the recreational use criteria at the point of entering James Island Creek will result in meeting the recreational use standard.

Table 6. SSM and geometric mean percent reductions for stations JIC1 and JIC2 in James Island Creek.

	SSM % reduction	Geomean % reduction
JIC1	74	81
JIC2	95	96

5.2 Critical Conditions

Critical conditions are the “worst-case” environmental conditions for exceedance of water quality standards and which occur at an acceptable frequency (US EPA 1999). Due to the tidal and complex hydrologic nature of James Island Creek, it is unclear what a critical flow would be. By including all data in the calculations, inclusion of the critical condition is implicit.

5.3 Existing Conditions

Due to the tidal nature of the system, it is difficult to calculate an existing load for this system. For this reason, existing conditions are given as a concentration. Existing concentration is calculated as the concentration of Enterococcus at the 90th percentile point based on the normal line fit to the monitoring data. Existing 30-day geometric mean concentrations range from 178/100 ml to 769MPN/100 ml for stations JIC1 and JIC2, respectively. SSMs are 385 MPN/100ml and 1965 MPN/100ml for stations JIC1 and JIC2, respectively.

5.4 Wasteload Allocation

The WLA is the portion of the TMDL allocated to NPDES-permitted point sources (US EPA 1991). The wasteload summation is determined by subtracting the margin of safety and

the sum of the load allocation from the total maximum daily load. Note that all illicit dischargers, including SSOs, are illegal and not covered under the WLA of this TMDL.

5.4.1 Continuous Point Sources

James Island Creek is classified as SA waters and dischargers to these waters are allowable if the Department deems appropriate. Currently, there are no continuous NPDES-permitted discharges to the affected TMDL watersheds with an *Enterococci* effluent limit on their NPDES permit. Future continuous discharges are required to meet the prescribed loading for the pollutant of concern based on permitted flow and assuming an allowable permitted daily maximum concentration of 104 MPN/100mL and monthly geomean concentration of 35 MPN/100mL.

5.4.2 Non-Continuous Point Sources

Non-continuous point sources include all NPDES-permitted stormwater discharges, including current and future MS4s, construction and industrial discharges covered under permits numbered SCS and SCR and/or regulated under South Carolina Water Pollution Control Permits: R61-9, §122.26(b)(4),(7),(14)-(21) (SC DHEC 2014). Illicit discharges, including SSOs, are not covered under any NPDES permit and are subject to compliance and enforcement mechanisms.

Table 7. TMDLs for James Island Creek watershed. Loads are expressed as most probable number (MPN) per 100 ml.

Station	90th %tile of Existing Load (MPN/100 ml)	TMDL ^{1,2} (MPN/100ml)	WQ Target (MPN/100ml)	Margin of Safety (MPN/100ml)	WLA			LA % Reduction to Meet LA ⁶
					Continuous Sources ³ (MPN/100ml)	Non-Continuous Sources ^{4,6} (%) Reduction)	Non-Continuous SCDOT ^{5,6} (%) Reduction)	
JIC1	385	104	98.8	4.2	See Note Below	74%	74%	74%
JIC1	178	35	33.25	1.52	See Note Below	81%	81%	81%
JIC2	2090	104	98.8	4.2	See Note Below	95%	95%	95%
JIC2	769	35	33.25	1.52	See Note Below	96%	96%	96%

Table Notes:

1. TMDL is expressed as a concentration. If daily average tidal exchange estimates were available, this number could be converted to load in MPN/day by multiplying flow by concentration and a conversion factor.
2. SA water WQS = Not to exceed a geometric mean of 35/100 ml over a 30-day period; nor shall a SSM exceed 104 MPN/100 ml
3. WLA is expressed as a daily maximum of 104 MPN/100 ml and a 30-day geometric mean of 35 MPN/100 ml. There are no continuous dischargers at this time. Future continuous discharges are required to meet the prescribed loading for the pollutant of concern. Loadings are developed based upon permitted flow and an allowable permitted maximum concentration of 104 MPN/100ml or 30-day geometric mean of 35 MPN/100 ml.
4. Percent reduction applies to all NPDES-permitted stormwater discharges, including current and future MS4, construction and industrial discharges covered under permits numbered SCS & SCR. Stormwater discharges are expressed as a percentage reduction due to the uncertain nature of stormwater discharge volumes and recurrence intervals. Stormwater discharges are required to meet percentage reduction or the existing instream standard for pollutant of concern in accordance with their NPDES Permit.

5. By implementing the best management practices that are prescribed in either the SCDOT annual SWMP or the SCDOT MS4 Permit to address Enterococcus, the SCDOT will comply with these TMDLs and its applicable WLA to the maximum extent practicable (MEP) as required by its MS4 permit.
6. Percent reduction applies to existing concentration.

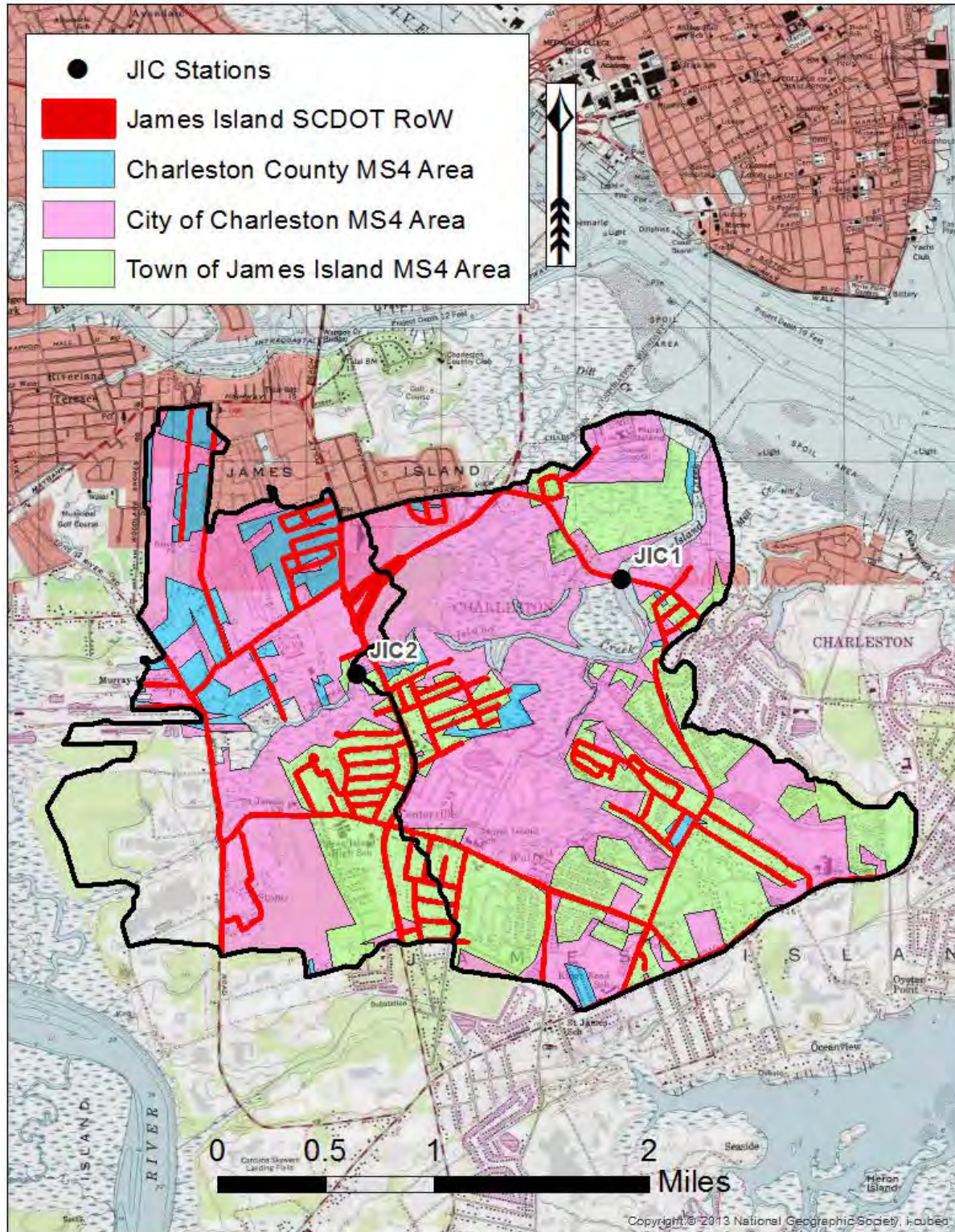


Figure 12. MS4s located within James Island Creek TMDL watershed.

All areas defined as "Urbanized Area" by the US Census are required under the NPDES Phase II Stormwater Regulations to obtain a permit for the discharge of stormwater. Other non-

urbanized areas may be required under the NPDES Phase II Stormwater Regulations to obtain a permit for the discharge of stormwater. Based on the 2010 US Census, at the time of the TMDL development, a portion of James Island Creek watershed was classified as urbanized area.

Charleston County, City of Charleston, SCDOT, and Town of James Island are the designated MS4s located in the TMDL areas (Figure 12). Regulated MS4s are subject to the WLA component of this TMDL; however, there may be other unregulated MS4s located in the watershed that are subject to the LA component of this TMDL. At such time that the referenced entities or other future unregulated entities become regulated NPDES MS4 entities and subject to applicable provisions of SC Regulation 61-68, they will be required to meet load reductions prescribed in the WLA component of the TMDL. This also applies to future discharges associated with industrial and construction activities that will be subject to R61-9, §122.26(b)(4),(7),(14)-(21) (SC DHEC 2011).

Waste load allocations for stormwater discharges are expressed as a percentage reduction instead of a numeric concentration due to the uncertain nature of stormwater discharge volumes and recurrence intervals. Stormwater discharges are required to meet the percentage reduction or the existing instream standard for the pollutant of concern. The percent reduction is based on the maximum percent reduction (critical condition) necessary to achieve target conditions. Table 7 presents the reductions needed for the impaired segments. The percent reductions in this TMDL also apply to the *Enterococci* waste load attributable to those areas of the watershed which are covered or will be covered under NPDES MS4 permits.

As appropriate information is made available to further define the pollutant contributions for the permitted MS4, an effort can be made to revise these TMDLs. This effort will be initiated as resources permit and if deemed appropriate by the Department. For the Department to revise these TMDLs the following information should be provided, including but not limited to:

- o An inventory of service boundaries of the MS4 area covered in the MS4 permit provided as ArcGIS compatible shape files.
- o An inventory of all existing and planned stormwater discharge points, conveyances, and drainage areas for the discharge points, provided as ArcGIS compatible shape files. If drainage areas are not known, any information that would help estimate the drainage areas should be provided. The percentage of impervious surface within the MS4 area should also be provided.
- o Appropriate and relevant data should be provided to calculate individual pollutant contributions for the MS4 permitted entities. At a minimum, this information should include precipitation, water quality, and flow data for stormwater discharge points.

Compliance with terms and conditions of existing and future NPDES sanitary and stormwater permits (including all construction, industrial, and MS4) will effectively implement the WLA and demonstrate consistency with the assumptions and requirements of the TMDL. However, the Department recognizes that the SCDOT is not a traditional MS4 in that it does not possess statutory taxing or enforcement powers. The SCDOT does not regulate land use of zoning, issue building or development permits.

5.5 Load Allocation

The Load Allocation (LA) applies to the nonpoint sources of *Enterococci* bacteria which includes unregulated processes/entities and is expressed both as a load and as a percent reduction. The LA is calculated as the difference between the target concentration under the critical condition and the point source WLA. The LA for each of the impaired stations in James Island Creek is expressed in tables as percent reduction. The Department believes that meeting the highest percent reduction or the WQS, whichever is less restrictive, will effectively protect the recreational uses of James Island Creek. Besides SCDOT, there are three other regulated NPDES permitted MS4s located in the drainage area, City of Charleston, Town of James Island, and Charleston County. There may be other unregulated stormwater discharges located in the watershed that are subject to LA component of this TMDL which currently are not NPDES permitted. At such time that the referenced entities, or other future unregulated entities become regulated NPDES MS4 entities and subject to applicable provisions of SC Regulation 61-68D, they will be required to meet load reduction prescribed in the WLA component of the TMDL. This also applies to future discharges associated with industrial and construction activities will be subject to R. R61-9 §122.26(b)(4),(7),(14) - (21) (SC DHEC 2011).

5.6 Seasonal Variability

Federal regulations require that TMDLs take into account the seasonal variability in watershed loading. The variability in these TMDLs is accounted for by using multiple years of data collected during hydrological and water quality sampling data sets. In addition, an evaluation of historic fecal coliform data collected at RT-052098 from November through April demonstrated that the instream recreational use standard will be protected by TMDLs developed using enterococci data collected at JIC1 and JIC2 May through October.

5.7 Margin of Safety

A margin of safety (MOS) allows for an accounting of the uncertainty in the relationship between pollutant loads and receiving water quality (US EPA, 1999). Incorporation of a

MOS can be done either explicitly within the TMDL calculation or implicitly by using conservative assumptions (US EPA 1991). This TMDL has an explicit 5% margin of safety. All water quality data is compared to of 104 MPN/100ml which is the SSM water quality standard minus five percent margin of safety (MOS), and to 35 MPN/100ml with is the geometric mean water quality standard minus 5% MOS. There is also an unspecified implicit margin of safety in the percent reduction calculations derived from the cumulative probability graphs due to the assumption of independence of the data points (Novotny, 2004).

5.8 Calculation of the TMDL

A TMDL represents the loading capacity (LC) of a waterbody, which is the maximum loading a waterbody can receive without exceeding water quality standards (US EPA, 1999). The TMDL is the sum of the WLA for point sources, the LA for non-point sources and natural background, and a margin of safety (MOS). The TMDL can be represented by the equation (US EPA, 2001):

$$TMDL = LC = WLA + LA + MOS$$

The equation above results in reductions of Enterococci concentrations ranging from 74% to 95% to meet the SSM and 81% to 96% in order to meet the geometric mean water quality standards for *Enterococci*. Calculated TMDL reductions applicable to each station, as well as target concentration of 33.25/100 ml, are shown on Table 7.

Based on the information available at this time, the portions of the watersheds that drains directly to a regulated MS4 and that which drains through the non-regulated MS4 has not been clearly defined. Loading from both types of sources (regulated and non-regulated) typically occur in response to rainfall events, and discharge volumes as well as recurrence intervals are largely unknown. Therefore, where applicable, the regulated MS4 is assigned the same percent reduction as the non-regulated sources in the watershed. Compliance with the MS4 permit in regard to this TMDL document is determined at the point of discharge to waters of the state. The regulated MS4 entity is only responsible for implementing the TMDL WLA in accordance with their MS4 permit requirements and is not responsible for reducing loads prescribed as LA in this TMDL document.

5.9. Reasonable Assurance

NPDES permits are issued for regulated dischargers, including continuous and non-continuous sources of pathogenic bacteria. In salt waters, the applicable recreation use water quality standard indicator is *Enterococcus* bacteria. Continuous discharges are required to target the *Enterococcus* water quality standard at the point of discharge. For regulated non-continuous discharges, the *Enterococcus* standard should be targeted to the

maximum extent practicable. There may be other regulated activities present that could contribute to *Enterococcus* loadings in the watershed. New septic tanks, animal feeding operations (AFOs), land application of treated sludge or wastewater also require permits that reduce the potential for runoff of bacteria into waters of the State.

Other unregulated sources of *Enterococcus* loadings in the watershed may include wildlife, urban and suburban runoff. These sources may be reduced through means such as best management practices, local ordinances, outreach education efforts as well as 319 grant opportunities. SCDHEC has fostered effective partnerships between other federal, state and local entities to help reduce the potential for runoff of bacteria into waters of the State. Collectively, and once implemented, these reduction mechanisms will provide reasonable assurance that the recreation use water quality standard will be attained in this watershed.

6.0 Implementation

The implementation of both point (WLA) and non-point (LA) source components of the TMDL are necessary to bring about the required reductions in *Enterococci* loading to James Island Creek in order to achieve water quality standards. Using existing authorities and mechanisms, an implementation plan providing information on how point and non-point sources of pollution are being abated or may be abated in order to meet water quality standards is provided. Sections 6.1 and 6.2 and their subsections presented below correspond with sections 3.1 and 3.2 and their subsections of the source assessment presented in the TMDL document. As the implementation strategy progresses, DHEC may continue to monitor the effectiveness of implementation measures and evaluate water quality where deemed appropriate.

Point sources are discernible, confined, and discrete conveyances of pollutants to a water body including but not limited to pipes, outfalls, channels, tunnels, conduits, man-made ditches, etc. The Clean Water Act's primary point source control program is the NPDES. Point sources can be broken down into continuous and non-continuous point sources. Some examples of a continuous point source are domestic and industrial WWTF. Non-continuous point sources are related to stormwater and include MS4s and construction activities, etc. Current and future NPDES discharges in the referenced watersheds are required to comply with the load reductions prescribed in the WLA.

Nonpoint source pollution originates from multiple sources over a relatively large area. It is diffuse in nature and indistinct from other sources of pollution. It is generally caused by the pickup and transport of pollutants from rainfall moving over and through the ground. Nonpoint sources of pollution may include, but are not limited to wildlife, agricultural activities, illicit discharges, failing septic systems, and urban runoff. Nonpoint sources

located in unregulated portions of the watershed are subject to the LA and not the WLA of the TMDL document.

South Carolina has several tools available for implementing the non-point source component of this TMDL. The *Implementation Plan for Achieving Total Maximum Daily Load Reductions from Nonpoint Sources for the State of South Carolina* (SC DHEC, 1998) document is one example. Another key component for interested parties to control pollution and prevent water quality degradation in the watershed would be the establishment and administration of a program of Best Management Practices (BMPs). Best management practices may be defined as a practice or a combination of practices that have been determined to be the most effective, practical means used in the prevention and/or reduction of pollution.

Interested parties (local stakeholder groups, universities, local governments, etc.) may be eligible to apply for CWA §319 grants to install BMPs that will implement the LA portion of these TMDLs and reduce nonpoint source *Enterococcus* loadings to James Island Creek. Congress amended the CWA in 1987 to establish the §319 Nonpoint Source Management Program. Under §319, States receive grant money to support a wide variety of activities including the restoration of impaired waters. TMDL implementation projects are given highest priority for §319 funding. CWA §319 grants are not available for implementation of the WLA component of this TMDL but may be available for the LA component within permitted MS4 jurisdictional boundaries. Additional resources are provided in Section 7.0 of this TMDL document.

SCDHEC will work with the agencies in the area to provide nonpoint source education in this watershed and the surrounding watersheds. Local sources for nonpoint source education include Charleston Counties Soil and Water Conservation Districts, local Natural Resources Conservation Service, Clemson Extension Service, South Carolina Department of Natural Resources, S.C. Sea Grant Extension Program.

The Department recognizes that adaptive management/implementation of these TMDLs might be needed to achieve the water quality standard and we are committed towards targeting the load reductions to improve water quality in James Island Creek watershed. As additional data and/or information become available, it may become necessary to revise and/or modify the TMDL targets accordingly.

6.1 Implementation Strategies

The strategies presented in this document for implementation of the referenced TMDL are not inclusive and are to be used only as guidance. The strategies are informational

suggestions which may lead to the required load reductions being met for the referenced watersheds while demonstrating consistency with the assumptions and requirements of the TMDLs. Application of certain strategies provided within may be voluntary and are not a substitute for actual NPDES permit conditions.

6.1.1 Continuous Point Sources

Continuous point source WLA reductions are implemented through NPDES permits. Currently, there are no direct discharges to James Island Creek.

6.1.2 Non-Continuous Point Sources

An iterative BMP approach as defined in the general storm water NPDES MS4 permit is expected to provide significant implementation of the WLA. Discovery and removal of illicit storm drain cross connections is one important element of the storm water NPDES MS4 permit. Public nonpoint source pollution education is another. Other permit requirements for implementing WLAs in approved TMDL documents will vary across waterbodies, discharges, and pollutant(s) of concern. The allocation within a TMDL area can take many different forms – narrative, numeric, specified BMPs – and may be complimented by other special requirements such as monitoring.

The level of monitoring necessary, deployment of structural and non-structural BMPs, evaluation of BMP performance, and optimization or revisions to the existing pollutant reduction goals of the SWMP or any other plan is TMDL and watershed specific. Hence, it is expected that NPDES permit holders evaluate their existing SWMP or other plans in a manner that would effectively address implementation of this TMDL with an acceptable schedule and activities for their permit compliance.

The Department staff (permit writers, TMDL project managers, and compliance staff) is willing to assist in developing or updating the referenced plan as deemed necessary. Please see Appendix C – Evaluating the Progress of MS4 Programs which provides additional information as it relates to evaluating the effectiveness of an MS4 Permit as it related to compliance with approved TMDLs. Compliance with terms and conditions of existing and future NPDES sanitary and stormwater permits (including all construction, industrial and MS4) may effectively implement the WLA and demonstrate consistency with the assumptions and requirements of the TMDL. For SCDOT, existing and future NPDES MS4 permittees, compliance with terms and conditions of its NPDES permit is effective implementation of the WLA to the MEP. For existing and future NPDES construction and industrial stormwater permittees, compliance with terms and condition of its permit is effective implementation of the WLA. Required load reductions in the LA portion of this

TMDL can be implemented through voluntary measures and are eligible for CWA §319 grants.

The Department acknowledges that progress with the assumptions and requirements of the TMDL by MS4s is expected to take one or more permit iteration. Achieving the WLA reduction for the TMDL may constitute MS4 compliance with its SWMP provided the MEP definition is met; even where, the numeric percent reduction may not be achieved in the interim.

Regulated MS4 entities are required to develop a SWMP that includes the following: public education, public involvement, illicit discharge detection & elimination, construction site runoff control, post construction runoff control, and pollution prevention/good housekeeping. These measures are not exhaustive and may include additional criterion depending on the type of NPDES MS4 permit that applies. These examples are recognized as acceptable stormwater practices and may be applied to unregulated MS4 entities or other interested parties in the development of a stormwater management plan.

An informed and knowledgeable community is crucial to the success of a stormwater management plan (US EPA, 2005). MS4 entities may implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges on local waterbodies and the steps that can be taken to reduce stormwater pollution. Some appropriate BMPs may be brochures, educational programs, storm drain stenciling, stormwater hotlines, tributary signage, and alternative information sources such as websites and bumper stickers.

The public can provide valuable input and assistance to a MS4 program and they may have the potential to play an active role in both development and implementation of the stormwater program where deemed appropriate. There are a variety of practices that can involve public participation such as public meetings/citizens panels, volunteer water quality monitoring, volunteer educators, community clean-ups, citizen watch groups, and “Adopt a Storm Drain” programs which encourage individuals or groups to keep storm drains free of debris and monitor what is entering local waterways through storm drains (US EPA, 2005).

Illicit discharge detection and elimination efforts are also necessary. Discharges from MS4s often include wastes and wastewater from non-stormwater sources. These discharges enter the system through either direct connections or indirect connections. The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies (US EPA, 2005). Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and

human health. MS4 entities may have a storm sewer system map which shows the location of all outfalls and to which waters of the US they discharge to. If not already in place, an ordinance prohibiting non-stormwater discharges into MS4 with appropriate enforcement procedures may also be developed. Entities may also have a plan for detecting and addressing non-stormwater discharges. The plan may include locating problem areas through infrared photography, finding the sources through dye testing, removal/correction of illicit connections, and documenting the actions taken to illustrate that progress is being made to eliminate illicit connections and discharges.

A program might also be developed to reduce pollutants in stormwater runoff to their MS4 from construction activities. An ordinance or other regulatory mechanism may exist requiring the implementation of proper erosion and sediment controls on applicable construction sites. Site plans should be reviewed for projects that consider potential water quality impacts. It is recommended that site inspections should be conducted, and control measures enforced where applicable. A procedure might also exist for considering information submitted by the public (US EPA, 2005). For information on specific BMPs please refer to the SCDHEC Stormwater Management BMP Handbook online at: <http://www.scdhec.gov/Environment/WaterQuality/Stormwater/BMPHandbook/>

Post-construction stormwater management in areas undergoing new development or redevelopment is recommended because runoff from these areas has been shown to significantly affect receiving waterbodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction stormwater discharges is the most cost-effective approach to stormwater quality management (US EPA, 2005). Strategies might be developed to include a combination of structural and/or non-structural BMPs. An ordinance or other regulatory mechanism may also exist requiring the implementation of post-construction runoff controls and ensuring their long term-operation and maintenance. Examples of non-structural BMPs are planning procedures and site-based BMPs (minimization of imperviousness and maximization of open space). Structural BMPs may include but are not limited to stormwater retention/detention BMPs, infiltration BMPs (dry wells, porous pavement, etc.), and vegetative BMPs (grassy swales, filter strips, rain gardens, artificial wetlands, etc.)

Pollution prevention/good housekeeping is also a key element of stormwater management programs. Generally, this requires the MS4 entity to examine and alter their actions to ensure reductions in pollution are occurring. This could also result in a reduction of costs for the MS4 entity. It is recommended that a plan be developed to prevent or reduce pollutant runoff from municipal operations into the storm sewer system and it is encouraged to include employee training on how to incorporate pollution prevention/good housekeeping techniques. To minimize duplication of effort and conserve resources, the

MS4 operator can use training materials that are available from EPA or relevant organizations (US EPA, 2005).

MS4 communities are encouraged to utilize partnerships when developing and implementing a stormwater management program. Watershed associations, educational entities, and state, county, and city governments are all examples of possible partners with resources that can be shared. For additional information on partnerships contact the SCDHEC Watershed Manager for the waterbody of concern online at:

<http://www.scdhec.gov/HomeAndEnvironment/Water/Watersheds/Contacts/>

For additional information on stormwater discharges associated with MS4 entities please see the US EPA NPDES website online at:

<https://www.epa.gov/npdes/stormwater-discharges-municipal-sources> for information pertaining to the National Menu of BMPs, Urban BMP Performance Tool, Outreach Documents, etc.

The Department acknowledges that progress with the assumptions and requirements of the TMDL by MS4s is expected to take one or more permit iteration. Achieving the WLA reduction for the TMDL may constitute MS4 compliance with its SWMP, provided the MEP definition is met, even where the numeric percent reduction may not be achieved in the interim.

6.2 Nonpoint Sources

6.2.1 Urban and Suburban Stormwater Runoff

In estuaries, urban runoff is considered the leading cause of impairment. Runoff from urban areas is the results of imperviousness, population and traffic density and all activities connected with urban living (Novotny, 2003). Also, estuaries are saline environments and urban runoff, due to precipitation is fresh water. This fresh water runoff into the estuarine environments causes salinity variances, adversely effecting organisms that are adapted to high salinity. Several studies have shown that salinity fluctuations cause a decrease in biomass of organisms, change in species dominance, reduced growth and survival and other physiological stress. These studies recommend gaining control of salinity fluctuations may help improve estuarine habitats through management of freshwater runoff from urban and suburban environments (Montague & Ley 1993, Mallin et al. 2008).

Potential BMPs for residential, industrial and commercial lots with impervious surfaces for consideration but not limited to are, capturing rain by either using rain barrels or rain pillow (for single family residential units or other small buildings), or a rain water collection system, such as a cistern, for later use in landscape watering or other none potable uses. Another

option would be, when appropriate, constructing rain gardens or wetlands to slow surface water runoff rates from impervious surfaces and to allow for percolation of runoff to recharge ground water. Also, using porous pavements/materials allows runoff due to precipitation percolate hence reducing the runoff rate.

6.2.2 Agricultural Runoff

Agriculture is a complex and large industry with great potential to adversely affect the environment by nonpoint source runoff (Novotny 2003). Sources of Enterococcus bacteria of nonpoint source origins to the nearby water bodies from agricultural and silvicultural activities are livestock with uncontrolled access to riparian areas, improper manure application, and concentrated or pastured animal operations, etc. Pastureland without proper erosion control measures is over grazed, or when grazing livestock are allowed to approach receiving waters are contributing to nonpoint source pollution. If these are controlled, and with additional BMPs, pollution from these lands can be minimized (Novotny 2003).

Agricultural BMPs can be vegetative, structural or management oriented. When selecting BMPs, it is prudent to keep in mind that nonpoint source related pollution occurs when a pollutant becomes available, is detached and then transported to nearby receiving waters. Therefore, for BMPs to be effective, the transport mechanism of the pollutant, Enterococcus, needs to be identified.

Fencing livestock is an effective way for confining the livestock in a certain area where BMPs are deployed; however, in certain cases it may not be sufficient for prevention of overland runoff. It may help to deploy additional BMPs such as a vegetative buffer with different growth rates behind the fence of where livestock are kept.

There are several state and federal assistance programs available to agricultural producers, and some of these are described below and electronic links for these programs are available under Section 7 of the TMDL document.

One of the programs that are available through USDA is the Environmental Quality Incentives Program (EQIP). This also is a voluntary conservation program for farmers and ranchers that promote agricultural production and environmental quality as national goals. Eligible participants receive financial and technical help from EQIP to install or implement structural and management related BMPs. Further information is available in Section 7 of this document.

It is recommended that BMPs for all existing agricultural facilities be reviewed for their effectiveness and reduction of runoff.

6.2.3 Failing Septic Systems

Age, lack of maintenance and improper use can cause septic systems to malfunction. Homeowner education about proper maintenance and repairing of their septic systems may help reduce runoff from these treatment systems. Also, encouraging homeowners to have their septic systems inspected and pumped on regular basis is another potential intervention for reducing bacterial runoff/contamination from these systems.

In addition to the resources cited in Section 7 of this document for the implementation of these TMDLs, Clemson Extension has developed a Home-A-Syst handbook that can help urban or rural homeowners reduce sources of NPS pollution from their property. This document guides homeowners through a self-assessment, including information on proper maintenance practices for septic tanks. SCDHEC also employs a nonpoint source educator who can assist with distribution of these tools as well as provide additional BMP information.

The Office of Coastal Resource Management (OCRM) has created a toolkit for homeowners and local governments which include tips for maintaining their systems. These septic system Do's and Don'ts are as follows:

Septic System Do's and Don'ts from SCDHEC Office of Coastal Resource Management:

Do's:

- o Conserve water to reduce the amount of wastewater that must be treated and disposed of by your system. Doing laundry over several days will put less stress on your system.
- o Repair any leaking faucets or toilets. To detect toilet leaks, add several drops of food dye to the toilet tank and see if dye ends up in the bowl.
- o Divert down spouts and other surface water away from your drainfield. Excessive water keeps the soil from adequately cleansing the wastewater.
- o Have your septic tank inspected yearly and pumped regularly by a licensed septic tank contractor.

Don'ts:

- o Don't drive over your drainfield or compact the soil in any way.
- o Don't dig in your drainfield or build anything over it, and don't cover it with a hard surface such as concrete or asphalt.
- o Don't plant anything over or near the drainfield except grass. Roots from nearby trees and shrubs may clog and damage the drain lines.

- o Don't use your toilet as a trash can or poison your system and the groundwater by pouring harmful chemicals and cleansers down the drain. Harsh chemicals can kill the bacteria that help purify your wastewater.

For additional information on how septic systems work and how to properly plan a septic system, please visit the DHEC Environmental Health Onsite Wastewater page at the following link: <http://www.scdhec.gov/environment/envhealth/Septic/>

6.2.4 Wildlife and Domestic Animals

In any public places, feeding of or providing food for wild animals including deer, wild ducks, geese, swans and seagulls should be discouraged. By avoiding the feeding of birds, there will be reduced waste accumulating on impervious areas such as on roadsides, walkways, boats, docks and related structures thus helping to avoid these structures from becoming conveyors of fecal matter into the receiving waters due to run-off from precipitation or tides (US EPA, 2001).

Planting and maintaining a vegetative buffer around the residential areas will help filter pet waste that may accumulate in gardens and public walkways. Without any buffers or other BMPs, during rain events, fecal matter may be washed off to the roadside stormwater ditches. Installation of pet waste collection stations in residential neighborhoods along with dispensers of pet waste bags and bag holders for dog owners are recommended.

There are several other recommendations in Section 7 of this document along with suggestions for public outreach and education.

6.2.5 Marinas, Boating Activities and Structures

Boating related activities have potential to contribute to Enterococcus contamination through potential discharges from installed toilet (MSD) and gray water, and these discharges can contain bacteria. Improperly maintained or malfunctioning MSDs have the potential to leak or discharge untreated sewage (US EPA, January 2010). Therefore, it is important to bring attention of boating public to available pumpout facilities near James Island Creek. A map of available pumpout facilities can be found at <http://www.dnr.sc.gov/marine/vessel/pdf/coastalmaps2013.pdf>

Also, Charleston Waterkeeper provides boaters free pumpouts. For details, contact the organization: <http://charlestonwaterkeeper.org/what-we-do/programs/mobile-pumpout/>

Another important factor is outreach and education for boat and dock owners regarding the proper use and maintenance of MSDs, and impact of improper vessel discharges in Class SA waters. There are pumpout facilities located in Cooper and Ashley Rivers and within the Charleston Harbor (SC DNR, 2012).

Docks can be one of the sources as well as conveyors (as impervious surfaces) for potential bacteria contamination. Especially during the boating season, family pets can also be sources for contamination. Also fishing and shellfishing (such as crabbing) related waste can attract wildlife, especially birds and waste from these types of activities may need to be contained and disposed of properly.

7.0 Resources

This section provides a listing of available resources to aid in the mitigation and control of pollutants. There are examples from across the nation, most of which are easily accessible on the World Wide Web.

7.1 General Information for Non-Continuous Point Sources

Center for Watershed Protection. Available at: <http://www.cwp.org/>

Interlocking Concrete Pavement Institute. Available at: <http://www.icpi.org/>

Rain pillows: Rainwater Harvesting from Rooftop Catchments. Available at:

<http://www.oas.org/usde/publications/Unit/oea59e/ch10.htm>

DC Greenworks Green Roofs. Available at: <http://www.dcgreenworks.org/>

Roofscapes, Inc. Taking Green Roofs to the Next Level. Available at:

<http://www.roofmeadows.com/>

Rooftops to Rivers: Green Strategies for Controlling Stormwater and Combined Sewer Overflows. Natural Resources Defense Council. Available at:

<http://www.nrdc.org/water/pollution/rooftops/contents.asp>

Low Impact Development Center, Inc. Sustainable Design and Water Quality Research.

Available at: <http://www.lowimpactdevelopment.org/>

SCDHEC Stormwater Outreach – Resources for Phase II Stormwater. Available at:

http://www.scdhec.gov/environment/water/ms4/html/other_programs.htm

7.2 General Information for Nonpoint Sources

7.2.1 Pet Waste

EPA Nonpoint Source Outreach Toolbox. Pet Care. Available at:
<http://cfpub.epa.gov/npstbx/FeaturedProductsDetail.cfm?TopicID=70>

Doggie Dooley In-Ground Waste Digester Systems. Available at:
http://www.drsfostersmith.com/product/prod_display.cfm?pcatid=570

7.2.2 Wildlife

Bird Deterrents:
<http://www.boatliftanddock.com/c-190-dock-bird-deterrent.aspx>
<https://www.hotfoot.com/>
http://www.birdbusters.com/bird_control_products.html

7.2.3 Septic Systems

Septic System Care. Available through Nonpoint Source Outreach Toolbox at:
<http://cfpub.epa.gov/npstbx/FeaturedProductsDetail.cfm?TopicID=70>
Clemson Extension Home*A*Syst. Available at:
<http://www.clemson.edu/psapublishing/Pages/Water/WQL21.pdf>

7.4 Outreach and Education

Nonpoint Source Runoff Pollution SCDHEC
<http://www.scdhec.gov/HomeAndEnvironment/Water/Stormwater/PreventingStormwaterPollution/>

7.5 Stormwater

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8.0

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Appendix A – NLCD 2011 Individual Landuses for TMDL Stations in James Island Creek

Landuse	JIC1	JIC2
	mi ² (%)	mi ² (%)
Open Water	0.12 (3.02)	0.02 (0.75)
Urban	1.9 (46.3)	1.4 (49.9)
Forest	0.7 (16.41)	0.9 (32.0)
Pasture/Hay	0.04 (1.0)	0.1 (2.4)
Woody and Emergent Herbaceous Wetlands	1.33 (33.3)	0.4 (14.9)
Total	4 mi ²	2.83 mi ²

Appendix B – Water Quality Data

Date JIC1	JIC1 Enterococcus	Date JIC2	JIC2 Enterococcus
7/10/2013	52	7/10/2013	1014
7/17/2013	121	7/17/2013	538
7/24/2013	52	7/24/2013	171
7/31/2013	166	7/31/2013	616
8/7/2013	10	8/7/2013	94
8/14/2013	140	8/14/2013	370
8/21/2013	31	8/21/2013	168
8/28/2013	120	8/28/2013	440
9/4/2013	60	9/4/2013	500
9/11/2013	100	9/11/2013	540
9/18/2013	30	9/18/2013	160
9/25/2013	132	9/25/2013	909
10/2/2013	30	10/2/2013	299
10/9/2013	262	10/9/2013	633
10/16/2013	161	10/16/2013	317
10/23/2013	144	10/23/2013	573
10/30/2013	613	10/30/2013	990
5/7/2014	63	5/7/2014	275
5/14/2014	20	5/14/2014	96
5/21/2014	256	5/21/2014	275
5/28/2014	31	5/28/2014	63
6/4/2014	20	6/4/2014	85
6/11/2014	20	6/11/2014	10
6/18/2014	52	6/18/2014	269
6/25/2014	52	6/25/2014	41
7/2/2014	41	7/2/2014	171
7/9/2014	10	7/9/2014	233
7/16/2014	134	7/16/2014	464
7/23/2014	20	7/23/2014	331
7/30/2014	31	7/30/2014	98
8/6/2014	63	8/6/2014	862
8/13/2014	41	8/13/2014	171
8/20/2014	31	8/20/2014	195
8/27/2014	20	8/27/2014	52
9/3/2014	63	9/3/2014	1333

9/10/2014	41	9/10/2014	122
9/17/2014	441	9/17/2014	6131
9/24/2014	1467	9/24/2014	305
10/1/2014	345	10/1/2014	1076
10/8/2014	52	10/8/2014	122
10/15/2014	833	10/15/2014	24196
10/22/2014	96	10/22/2014	160
10/29/2014	85	10/29/2014	414
5/6/2015	10	5/6/2015	145
5/13/2015	121	5/13/2015	181
5/20/2015	51	5/20/2015	135
5/27/2015	41	5/27/2015	246
6/4/2015	97	6/4/2015	1259
6/10/2015	480	6/10/2015	11199
6/17/2015	158	6/17/2015	131
6/24/2015	30	6/24/2015	96
7/1/2015	52	7/1/2015	223
7/8/2015	75	7/8/2015	520
7/15/2015	10	7/15/2015	31
7/22/2015	51	7/22/2015	350
7/29/2015	62	7/29/2015	63
8/5/2015	211	8/5/2015	282
8/12/2015	10	8/12/2015	52
8/19/2015	2098	8/19/2015	12033
8/26/2015	134	8/26/2015	171
9/2/2015	63	9/2/2015	213
9/9/2015	331	9/9/2015	5475
9/16/2015	110	9/16/2015	279
9/23/2015	131	9/23/2015	682
9/30/2015	41	9/30/2015	148
10/7/2015	355	10/7/2015	305
10/14/2015	187	10/14/2015	435
10/21/2015	211	10/21/2015	759
10/28/2015	1281	10/28/2015	556
05/04/2016	155	05/04/2016	221
05/11/2016	31	05/11/2016	269
05/18/2016	160	05/18/2016	1106

05/25/2016	10	05/25/2016	52
06/01/2016	146	06/01/2016	307
06/08/2016	41	06/08/2016	262
06/15/2016	135	06/15/2016	160
06/22/2016	20	06/22/2016	109
06/29/2016	663	06/29/2016	9804
07/06/2016	52	07/06/2016	909
07/13/2016	72	07/13/2016	428
07/20/2016	109	07/20/2016	441
07/27/2016	20	07/27/2016	256
08/10/2016	146	08/03/2016	285
08/17/2016	216	08/10/2016	1106
08/24/2016	41	08/17/2016	171
08/31/2016	86	08/24/2016	106
09/07/2016	41	08/31/2016	512
09/21/2016	63	09/07/2016	85
09/28/2016	85	09/14/2016	1081
10/12/2016	399	09/21/2016	1281
10/19/2016	98	09/28/2016	269
10/26/2016	120	10/12/2016	355
5/3/2017	41	10/19/2016	320
5/10/2017	10	10/26/2016	259
5/17/2017	161	5/3/2017	359
5/24/2017	884	5/10/2017	52
5/31/2017	135	5/17/2017	109
6/7/2017	292	5/24/2017	24196
6/14/2017	41	5/31/2017	328
6/21/2017	305	6/7/2017	7270
6/28/2017	97	6/14/2017	108
7/5/2017	41	6/21/2017	3968
7/12/2017	132	6/28/2017	359
7/19/2017	107	7/5/2017	109
7/26/2017	63	7/12/2017	181
8/2/2017	84	7/19/2017	345
8/9/2017	145	7/26/2017	4611
8/16/2017	156	8/2/2017	253
8/23/2017	51	8/9/2017	496

8/30/2017	2489	8/16/2017	867
9/6/2017	218	8/23/2017	284
9/14/2017	272	8/30/2017	7270
9/20/2017	84	9/6/2017	480
9/27/2017	226	9/14/2017	1334
10/4/2017	52	9/20/2017	235
10/11/2017	171	9/27/2017	426
10/18/2017	41	10/4/2017	63
10/25/2017	616	10/11/2017	860
5/2/2018	20	10/18/2017	142
5/9/2018	52	10/25/2017	2064
5/16/2018	30	5/2/2018	131
5/23/2018	97	5/9/2018	131
6/6/2018	86	5/16/2018	118
6/13/2018	63	5/23/2018	457
6/20/2018	41	5/30/2018	272
6/27/2018	41	6/6/2018	341
7/2/2018	96	6/13/2018	301
7/11/2018	144	6/20/2018	197
7/18/2018	199	6/27/2018	135
7/25/2018	94	7/2/2018	459
8/1/2018	733	8/8/2018	627
8/8/2018	97	8/15/2018	6867
8/15/2018	183	8/22/2018	269
8/22/2018	41	8/29/2018	405
8/29/2018	52	9/5/2018	145
9/5/2018	185	9/19/2018	1585
9/19/2018	109	9/26/2018	97
9/26/2018	20	10/3/2018	373
10/3/2018	169	10/12/2018	934
10/12/2018	805	10/17/2018	933
10/17/2018	61	10/24/2018	175
10/24/2018	61	10/31/2018	1281
10/31/2018	327		

Appendix C – Evaluating the Progress of MS4 Programs

Meeting the Goals of TMDLs and Attaining Water Quality Standards
Bureau of Water
August 2008

Described below are potential approaches that may be used by MS4 permit holders. These are recommendations and examples only, as SCDHEC-BOW recognizes that other approaches may be utilized or employed to meet compliance goals.

1. Calculate pollutant load reduction for each best management practice (BMP) deployed:
 - Retrofitting stormwater outlets
 - Creation of green space
 - LID activities (e.g., creation of porous pavements)
 - Creations of riparian buffers
 - Stream bank restoration
 - Scoop the poop program (how many pounds of poop were scooped/collected)
 - Street sweeping program (amount of materials collected etc.)
 - Construction & post-construction site runoff controls
2. Description & documentation of programs directed towards reducing pollutant loading
 - Document tangible efforts made to reduce impacts to urban runoff
 - Track type and number of structural BMPs installed
 - Parking lot maintenance program for pollutant load reduction
 - Identification and elimination of illicit discharges
 - Zoning changes and ordinances designed to reduce pollutant loading
 - Modeling of activities & programs for reducing pollutant reductions
3. Description & documentation of social indicators, outreach, and education programs
 - Number/Type of training & education activities conducted and survey results
 - Activities conducted to increase awareness and knowledge – residents, business owners. What changes have been made based on these efforts? Any measured behavior or knowledge changes?
 - Participation in stream and/or lake clean-up events or activities
 - Number of environmental action pledges
4. Water quality monitoring: A direct and effective way to evaluate the effectiveness of stormwater management plan activities.

- Use of data collected from existing monitoring activities (e.g., SCDHEC data for ambient monitoring program available through STORET; water supply intake testing; voluntary watershed group's monitoring, etc)
- Establish a monitoring program for permitted outfalls and/or waterbodies within MS4 areas as deemed necessary– use a certified lab
- Monitoring should focus on water quality parameters and locations that would both link pollutant sources and BMPs being implemented

5. Links:

- Evaluating the Effectiveness of Municipal Stormwater Programs. September 2007. EPA 833-F-07-010
- The BMP database - <http://www.bmpdatabase.org/BMPPerformance.htm> (this link is specifically to the BMP performance page, and lot more)
- EPA's STORET data warehouse - http://www.epa.gov/storet/dw_home.html
- EPA Region 5: STEPL – Spreadsheet tool for estimating pollutant loads <http://it.tetrattech-ffx.com/stepl/>
- Measurable goals guidance for Phase II Small MS4 - <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm>
- Environmental indicators for stormwater program- <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/part5.cfm>
- National menu of stormwater best management practices (BMPs) - <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>
- SCDHEC – BOW: 319 grant program has attempted to calculate the load reductions for the following BMPs:
 - Septic tank repair or replacement
 - Removing livestock from streams (cattle, horses, mules)
 - Livestock fencing
 - Waste Storage Facilities (a.k.a. stacking sheds)
 - Strip cropping
 - Prescribed grazing
 - Critical Area Planting
 - Runoff Management System
 - Waste Management System

- Solids Separation Basin
- Riparian Buffers

James Island Creek Enterococcus Bacteria TMDLs Responsiveness Summary

Comments were received from the following:

Charleston County

And the following individuals:

Gabriella Andrews	Kyle Draganov	Karen Henderson
Melissa Archer	Walt Dunlap	Franny Henty
Mary Arnold	Nicole Fagala	TL Herbert
Suzanne Auld	Louise Farrell	Kimberly Imbus
Tony Beall	Caroline Forgason	Carol Jackson (2)
Jennifer Biondi	Mary Edna Fraser (2)	Liz Jannetta
Baker Bishop	Matthew Gamble	Chris Jude
Kattie Boggeman	Rob Glasser	Katie Koval
Abigail Boyer	Darcie Goodwin	Judith Kramer
Richard Brendel	Vicky Grant	Hannah Kuhl
Walker Brock	Richards Gregory	Nathan Leach
Erica Browne	Kathy Greider	Luke Levanchy
Maggie Carragher	Tyler Grespin	Bryan Luce
Jocelyn Chateauvert	Carol Gross	Patricia Luck
Brandon Clark	Kaitlyn Hackathorn	Bobbie Lyon
Michael Claypoole	Lisa Hakamiun	Deanna Maguire
Carl Cole	Lynday Hall	Jennifer Mathis
Austin Dandridge	Tyrone Hanlan	Kathryn Matrangola
Sharon & Roland Day	Gerald Haram	Mike McCarthy
Laureen Deibert	Meagan Harper	Jerilyn McCombs
Joe Dennig	Kevin Hayes	Sarah McKenna
Richard Dom	Melissa Hayes	Savannah McLain

Sean McQuilken	Sarah Romano	Benjamin Toy
Alicia Mendicino	Irene Rowe	Phil Turner
Christine Mooberry	Jay Rucker	Christine von Kolnitz
Kathryn Mundy	Maureen Ryan	Theodosia Wade
Melissa Myers	Lisa Scharin	Kris Wetzel
Elizabeth Nemeth	Gustavo Serrano	Ian Wheeler
Jill Norton	Parker Singleton	Brian Wildstein
Dusty Parker	Rob Spawar	Richard Williams
Blake Pearce	Jeanne Sprott	Glenn Williman
Jessica Peragine	Christina Stanton	Carrie Wilson
Kate Pfile	Cris Sumpter	Mary Wofford
Stephanie Ragsdale	Nancy Swan	Elizabeth Zsolnay
Emily Randisi	Susan Thompson	
Christine Magnarella Ray	Mike Tinkey	
Harriet Reavis	Chris Toler	

Amendments:

The following additional amendments were made by the Department to the draft James Island Creek Enterococcus Bacteria TMDLs and associated appendices during the 30-day public comment period. These amendments were not made as a result of written comments received but may have been the result of an error, omission or the need for clarification.

Amendment 1, Page ii, abstract:

Fecal coliform bacteria was added to the following sentence in paragraph one: "Historically, there was one SC Department of Health and Environmental Control (DHEC) water quality monitoring station, RT-052098, which was monitored in 2005 for fecal coliform bacteria."

Amendment 2, Page 21, Section 4.0 Cumulative Probability Method:

A sentence was added to first paragraph: Because enterococcus is the applicable recreational use water quality indicator and more recent enterococcus data have been collected at JIC 1 and JIC2 in the watershed, the Department believes that the historic fecal coliform data collected at RT-052098 are less representative of current conditions in the watershed. The calculated reductions for JIC1 and JIC2 are expected to address the current recreational use water quality standard at RT-052098.

Amendment 3, Page 37, Section 5.6 Seasonal Variability:

After submitting the James Island Creek Enterococcus TMDL document to the USEPA Region 4 for final approval on September 19, 2019, the Department received a comment from USEPA staff. Specifically, the comment was that the TMDL document did not sufficiently address the seasonal variability.

In order to address their comment, the Department reviewed historical recreational use fecal coliform data collected monthly during 2005 from station RT-052098. These data were separated into two sets, May through October and November through April. This grouping allowed for an evaluation of James Island Creek data that includes the astronomical winter as well as the six month period where samples are not collected by the Charleston Waterkeeper (CWK) at sites JIC1 and JIC2.

From November through April 2005, there was one exceedance (500 cfu/100ml) of the fecal coliform 400 cfu/100 ml SSM of WQS out of 6 samples (n=6), a 17% exceedance rate. During May through October 2005, there was one exceedance (above 1600 cfu/100 ml) of the fecal coliform 400 cfu/100 ml SSM of WQS out of 7 samples (n=7), a 14% exceedance rate.

The specific method that was used for analyzing samples for fecal coliform during 2005 had an upper detection limit of 1600 cfu/100 ml. The sample result between November-April was 500 cfu/100 ml, and May-October result was above 1600 cfu/100 ml. This analysis of the 2005 fecal coliform data collected at RT-052098 is also summarized in the table below. Note that all data from 1999-current may be downloaded at the following link: <https://www.waterqualitydata.us/portal/>

James Island Creek	May-Oct	Nov-April
n	7	6
Number of Samples Exceeding WQS of 400 cfu/100 ml	1	1

Exceedance Rate	14%	17%
Average Exceedance	>1600 (n=1)	500 (n=1)

While frequency of exceedances were similar during these two time periods, the magnitude of the exceedances was different. The magnitude is normally determined as the arithmetic average of the sample results above the WQS of 400 cfu/100 ml. Here, with just one exceedance in each period, it is simply the exceedance value. While there are limited data available at this location, the magnitude of the exceedance is greater May-October suggesting that time frame is the critical period for bacterial levels in James Island Creek.

Since CWK samples for Enterococcus are collected on weekly basis, we were able to calculate monthly geometric means (35 mpn/100 ml WQS) for the two stations on James Island Creek. Using the monthly geometric means of Enterococcus data collected by CWK, percent reductions were calculated and are presented in tables Ab-1 and 5, as well as the WQ target (33.25 mpn/100 ml). Since the indicator bacteria for recreational waters was changed from fecal coliform to Enterococcus in 2013, comparison of magnitudes of fecal coliform to Enterococcus is not possible.

Concluding that May-October is the critical period in James Island Creek is based on limited data. In an attempt to reinforce this conclusion, the Department compared bacterial conditions in James Island Creek to nearby Shem Creek, where it so happens that additional November-April data are available that more clearly establish May-October as the critical period for Shem Creek. Similarity of the May-October bacterial responses in the two creeks could be an indication that the November-April responses are likely to be similar as well therefore, May-October is likely the critical period for James Island Creek just as it is for Shem Creek.

The Department also completed a precipitation analysis for James Island Creek and Shem Creek. Both Shem and James Island creeks are headwater tidal creeks located off of lower Charleston Harbor. The impact of 24, 48, 72, and 96 hours of lagged cumulative daily precipitation intervals on instream bacteria levels were analyzed using data collected by the waterkeeper. Cumulative daily precipitation amounts were divided into following intervals: 0, 0.11-0.5, 0.51-2.0, 2.1-4.0, 4.1 up to 10.8 inches. Percent of bacteria samples meeting and exceeding were tabulated by station, for both creeks. When results from lower stations are compared, both creeks have similar exceedances during same precipitation intervals and lag times. When upstream stations from both creeks are

compared, they have very similar exceedances during the same precipitation and lag times.

This analysis showed that most upstream stations had majority of exceedances occur during periods of no precipitation i.e. dry conditions, which may be an indication of that both streams have similar sources of bacteria. Additionally, when percent of exceedances and lag times are compared from both creeks, they are almost identical. Longitudinally moving from upstream to downstream stations, conditions improve and there are less exceedances near the confluence with Charleston Harbor.

The Department also compared the bacteria results shown in the table above to MD-071 results from Shem Creek. To illustrate the similarity between the exceedances and magnitudes, analysis results for MD-071 in Shem Creek and RT-042098 in James Island Creek are shown in the tables below.

Shem Creek	May-Oct	Nov-April
n	69	68
Number of Samples Exceeding WQS of 400 cfu/100 ml	15	4
Exceedance Rate	22%	6%
Average Exceedance	1047 (n=15)	1250 (n=4)

James Island Creek	May-Oct	Nov-April
n	7	6
Number of Samples Exceeding WQS of 400 cfu/100 ml	1	1
Exceedance Rate	14%	17%
Average Exceedance	>1600 (n=1)	500 (n=1)

Lastly, simply comparing the calculated TMDL percent reductions based on CWK data shows the percent reductions are almost identical with the same longitudinal trends from headwater to outlet in both creeks, as shown in the table below:

JIC Station	JIC TMDL Percent Reduction (GeoMean)	SC Station	SC TMDL Percent Reduction (GeoMean)
JIC1	81%	SC1	78%
		SC2	88%
JIC2	96%	SC3	96%

To summarize, although there are limited historical data from James Island Creek station RT-042098, comparison to Shem Creek indicates the following:

- ✓ Precipitation analysis indicate similar patterns for both creeks.
- ✓ Both upstream stations may have similar bacteria sources which are impacting the creeks during dry conditions.
- ✓ Conditions, bacteria exceedances starts improving longitudinally, moving upstream to downstream.
- ✓ Current geometric mean standard of 35 cfu/100 is much more restrictive than the former 400 mpn/100 ml.
- ✓ TMDL percent reductions in both creeks for the geometric mean standard are almost identical.

Using both CWK data and DHEC data collected from station MD-071 we can make an inference that these creeks are behaving similarly and likely have similar seasonal patterns; therefore, the calculated percent reductions for James Island Creek will also be protective November-April. Furthermore, because the geometric mean criterion is generally more restrictive than SSM, we are confident that percent reductions presented in the TMDL document, which are applicable year around, will also be protective from November through April.

In order to clarify the point regarding seasonal variability in the TMDL document, the Department has inserted the following language on page 37, Section 5.6: "In addition, an evaluation of historic fecal coliform data collected at RT-052098 from November through April demonstrated that the instream recreational use standard will be protected by TMDLs developed using enterococci data collected at JIC1 and JIC2 May through October."

Charleston County comments were submitted by Michele Richbourg of Thomas and Hutton

Charleston County Comment 1:

"Enterococci Units of Measure: Under Section E of SC R61-68, the Water Quality Standards for enterococci in Class SA saltwaters are given in units of MPN/100 ml. The draft TMDL for James Island Creek uses "cfu/100 ml" or "/100 ml" as units of measure for enterococci. To avoid confusion the TMDL should clearly state the units for enterococci bacteria compliance as MPN/100 ml. The TMDL should clarify when discussing historical data recorded as cfu/100 ml and provide a conversion factor where applicable."

Department's Response 1:

The oversight of using cfu as unit of measurement for enterococci in the draft TMDL document has been corrected and has been replaced by MPN.

Charleston County Comment 2:

"Comparison of total precipitation with bacteria sampling results from stations JIC1 and JIC2: See Table 5 on page 21. The sum of % meeting WQ and % not meeting WQ would be expected to 100%. The table should be revised for clarity."

Department's Response 2:

Table 5 from the from the draft TMDL document is shown below for both JIC1 and JIC 2. Another column shaded in gray has been added to the tables below for your reference. The new column shows the total number of samples used for cumulative precipitation intervals as well as the results of the analysis of data from zero to over 10 inches of precipitation.

The sample sizes for JIC1 and JIC2 are 118 and 120, respectively. Each row of cumulative precipitation such as 24 hours, 48 hours, etc., summarizes the number of samples meeting or exceeding the enterococcus single sample maximum water quality standard of 104 mpn/100 ml, for precipitation amounts ranging from zero to 10.7 inches. Blue arrows were added to the second row (24 hour) of table for JIC1 to show the direction of calculations as an example. As seen on "Table 5" below, percentage of various categories of precipitation and corresponding "meeting" and "not meeting" samples equal to 100% and to the sample size for each station.

Table 1. Comparison of total precipitation with bacteria sampling results from stations JIC1 and JIC2 (2013-2018).

JIC1 n=118	Zero precipitation # of samples (%) meeting WQ	Zero precipitation: # of samples (%) not meeting WQ	0.11 to 10.7 inches of precipitation: # of samples (%) meeting WQ	0.11 to 10.7 inches of precipitation: # of samples (%) not meeting WQ	Total number of samples (% of total)
24 hours	58 (49.2%) →	36 (30.5%) →	7 (5.9%) →	17 (14.4%) →	118 (100%)
48 hours	47 (39.8%)	25 (21.2%)	17 (14.4%)	29 (24.6%)	118 (100%)
72 hours	41 (34.7%)	22 (18.6%)	31 (26.3)	24 (20.3%)	118 (100%)
96 hours	34 (28.8%)	13 (11%)	32 (27.1%)	39 (33.1%)	118 (100%)

JIC2 n=120	Zero precipitation: # of samples (%) meeting WQ	Zero precipitation: # of samples (%) not meeting WQ	0.11 to 10.7 inches of precipitation: # of samples (%) meeting WQ	0.11 to 10.7 inches of precipitation: # of samples (%) not meeting WQS	Total number of samples (% of total)
24 hours	16 (13.3%)	77 (64.2%)	0 (0%)	27 (22.5%)	120 (100%)
48 hours	15 (12.5%)	57 (47.5%)	1 (0.8%)	47 (39.2%)	120 (100%)
72 hours	13 (10.8%)	49 (40%)	3 (2.5%)	56 (46.7%)	120 (100%)
96 hours	11 (9.2%)	34 (28.3%)	5 (4.2%)	70 (58.3%)	120 (100%)

After the public comment period had ended for the James Island Creek TMDL document, the Department noticed that Table 5 only included data from 2013 through 2017. This was an artifact of an earlier analysis that did not include 2018 data. Table 5 in the TMDL document has been revised to include data from 2013 through 2018 as originally intended. Note that the samples size for JIC1 and JIC2 increased to 142 from the earlier analysis.

Corrected Table 5

JIC1 n=142	Zero precipitation: # of samples (%) <u>meeting</u> WQ	Zero precipitation: # of samples (%) <u>not</u> meeting WQ	0.11 to 10.8 inches of precipitation: # of samples (%) <u>meeting</u> WQ	0.11 to 10.8 inches of precipitation: # of samples (%) <u>not</u> meeting WQ
24 hours	71 (50%)	41 (28.9%)	10 (7%)	20 (14.1%)
48 hours	60 (42.3%)	28 (19.7%)	21 (14.8%)	33 (23.2%)
72 hours	52 (36.6%)	25 (17.6%)	29 (20.4%)	36 (25.4%)
96 hours	39 (27.5%)	15 (10.6%)	42 (29.6%)	46 (32.4%)

JIC2 n=142	Zero precipitation: # of samples (%) <u>meeting</u> WQ	Zero precipitation: # of samples (%) <u>not</u> meeting WQ	0.11 to 10.8 inches of precipitation: # of samples (%) <u>meeting</u> WQ	0.11 to 10.8 inches of precipitation: # of samples (%) <u>not</u> meeting WQ
24 hours	17 (12%)	95 (66.9%)	0 (0%)	30 (21.1%)
48 hours	16 (11.3%)	72 (50.7%)	1 (0.7%)	53 (37.3%)
72 hours	14 (9.8%)	63 (44.4%)	3 (2.1%)	62 (43.7%)
96 hours	12 (8.5%)	43 (30.3%)	5 (3.5%)	82 (57.7%)

Charleston County comment 3:

"Tables and Figures: References to numbered tables and figures need to be updated."

Department's Response:

References to tables and figures have been updated.

Comments below were submitted by individual stakeholders or other interested parties and deemed similar in content. The Department has grouped together these comments for a single response.

Gabriella Andrews:

"I am writing in support of cleanups for James Island and Shem Creeks. My six-year old lives to swim and shrimp in these creeks every weekend, just as I did as a child, and I find myself hesitant to allow it after learning about the bacteria levels in these areas. Charleston's unique creeks and waterways are what keep us all employed (and sane)-whether we work directly on the water, or whether we benefit from visitors coming to the city to enjoy our incredible natural resources. We owe it to the environment and to future generations to address these issues before it's too late to turn back. Thank you for reading and for all that you do."

Melissa Archer:

"I support clean water in Charleston! I will work to improve water quality through volunteering, voting, and speaking up for environmental issues!"

Suzanne Auld:

"Thank you for all your efforts for making Charleston's waters safe for our families. We are proud to be a born and raised Lowcountry family and it is our joy to teach our sons how to fish, swim, and participate in water sports in our creeks and rivers. It is imperative that our water is safe for these activities. Thank you, and God Bless."

Tony Beall:

"I support efforts to clean up the highly polluted waters mentioned above. Water quality continues to be a problem due to fecal contamination and runoff. Please use DHEC's resources to give us cleaner waterways."

Jennifer Biondi:

"The local waterways are SO important to the beauty & safety of Charleston. Please help protect them by ensuring the cleanliness of the waterways!"

Baker Bishop:

"Dear Ms. Varlik, Thank you for your time. Please clean these Creeks up. Our waterways are too valuable a resource not to have their health and cleanliness a top priority. As an avid fisherman, it pains me to see some of these water quality results."

Kattie Boggeman:

"Please clean up Shem Creek and James Island (Ellis) Creek. We are so lucky to live in such a beautiful place, please restore it so we can enjoy every aspect of it safely. My family and I love to paddle board and it would be wonderful to have more safe places to go."

Abigail Boyer:

"I have grown up here in the low country. I love our creeks and rivers. I am a kayak guide. I take people on the water and share with them the beauty of the creeks. The community needs clean, healthy water ways to enjoy. I am in support of cleaning up our way waters!"

Richard Brendel:

"Water quality is an issue I really don't know that much about. What I do know is that I'm addicted to being in the water and it would be nice to know that it's clean. I understand

that you can't just flip a switch and presto, clean water. I also understand that this is an issue that needs to be addressed from all angles so that we can learn what causes unsafe water, as well as, how to manage it. Thanks for making this a priority!"

Walker Brock:

"Shem Creek and Ellis Creek need your help. Many who recreate on those creeks do not even know how impaired the waterways they enjoy are, and the wildlife certainly does not. As an advocate for clean water in Charleston, I thank you for prioritizing clean water targets for Shem and Ellis creeks."

Erica Browne:

"This is Erica Browne, a student at Georgia State University who partook in an alternative spring break to help clean up trash in creeks and lakes in Charleston this past March. Water standards that are unsafe for swimming pose a detrimental threat to the community and the entire ecosystem. Please take this threat to our safety seriously."

Maggie Carragher:

"It's so important for our rivers and creeks to be clean, especially in these high traffic areas where thousands of people swim and boat daily. Thanks for doing the right thing."

Jocelyn Chateauvert:

"Being a parent in Charleston can be a joy with some many water activities near by. Bacteria in the water is not good for our families and the wildlife that is just trying to keep up. Please do monitor and seek punitive damages to those who pollute our waters."

Brandon Clark:

"My name is Brandon Clark and I am very excited to hear about the efforts you guys will be making for James Island Creek and Shem Creek. I love the idea of safer water for people to swim and fish in. My wife Rachel and I live on Shem Creek at the top near Bowman Rd. on Rosemead Rd. in the house she was born and raised in and we have a true love for the creek and marsh. We have seen a big change in the amount of trash and water quality over the past 30 years (since Hurricane Hugo) and have been concerned about water quality. We pick up trash along the banks regularly and even canoe in the creek to clean out trash and debris. I even have images of my canoe full of trash from the upper section of the creek. This area is the area that is typically reporting high levels of bacteria. We think a lot of that is pet waste and maybe even septic waste that makes it way to the creek as well. I would like to offer my assistance and/or, observations/ideas/opinions, if you think it will help. We know a lot of people that live along the banks of the creek and

would be glad to help advocate clean water in the neighborhood. Let me know if we can help and thank you for your efforts."

Michael Claypoole:

"I urge you to continue supporting healthy ecosystems of the low country by passing bills and providing funding to clean up and protect waterways like Shem & Ellis Creeks."

Carl Cole:

"Healthy tidal creeks are an important part of our Lowcountry natural heritage. Charleston Waterkeeper has worked for several years to document that these creeks, while still largely intact, are no longer healthy. We depend on DHEC to ensure that local governments take effective measures to restore the creeks to health."

Austin Dandridge:

"I have lived in Charleston for over 10 years and on James Island 6 of those years. As a father, Charleston business owner, and avid water enthusiast, I want to see Shem Creek and James Island Creek safe and healthy for swimming. I fish the creeks and want my kids to be able to do the same."

Sharon & Roland Day:

"Thank you and the DHEC for setting cleanup targets for Shem Creek and James Island Ellis Creek. I know we all want to see these areas safe and healthy for swimming and water recreation. My husband and I are extremely pleased and excited that steps are being taken to ensure cleaner and healthier waterways. You have our full support. THANK YOU!"

Laureen Deibert:

"We live here in the Lowcountry because of the nearness to the water. The oceans, the creeks, the marshes all call to our hearts. It absolutely breaks my heart to hear that we do not have clean enough creeks to swim in; that we are polluting our waters to the point that our fish and fowl are also feeling the "pain". I support whatever needs to be done to help keep our waters clean, and I thank you for your testing."

Joe Dennig:

"Good Afternoon. Having lived on James Island for almost 20 years now, it's concerning to see the very high levels of bacteria being reported by Charleston Waterkeeper. Please let's set a cleanup target VERY SOON for James Island Creek as well as Shem Creek in Mt

Pleasant. We love relaxing on the creek in our kayaks and paddleboards and want to see some action. Thank you for your time!"

Richard Dom:

"James Island Creek needs to be cleaned up so that people can swim, water ski and consumefish from this creek. When I moved to Charleston in 1973, James Island Creek was enjoyed by many people because the creek was not polluted."

Kyle Draganov:

"I live on James Island. I'm tired of seeing that our creek water is not safe. Please support cleaning up Ellis Creek on James Island (and Shem Creek, too)."

Walt Dunlap:

"It is imperative to maintain the health of coastal waters such as Shem Creek. The pressure on coastal ecosystems is brutal and we are losing the battle without your help. Please do what you can to aid the Charleston Waterkeeper and their efforts."

Nicole Fagala:

"Please get these creeks clean we go init 3 times a week!"

Louise Farrell:

"[I have lived on James island for 28 years and I'm saddened to see the state of the creek. I hope,you will work to clean it up and restore clean water to future generations of James Islanders. Thank you for your help."

Caroline Forgason:

"Hoping testing and cleanup can make these creeks clean & contributing to the beauty and diversity of The Charleston area."

Matthew Gamble:

"I have been a kayak guide on Shem Creek for the last six years and the information I have learned about the consistently poor water quality in Shem and similar creeks has me more than a little concerned. In order for the creek to continue to provide the wealth of natural and economic benefits we need to make sure the water stays clean and the delicate ecosystem stays healthy. It is up to the lawmakers to listen to good science and feedback from constituents to make the best possible informed decisions. I believe we have an incredible opportunity to do this now, starting with Shem Creek and James Island creek."

Rob Glasser:

"We must take care of our estuaries and creeks"

Darcie Goodwin:

"I regularly paddle on the waters of Charleston, so clean creeks are very important to me. I want to thank you for cleaning up James Island Creek and Shem Creek. Clean, healthy waterways mean that I don't have to worry about falling in or getting water in my face."

Vicky Grant:

"I am in support of the pending clean up mandate for James Island/Ellis Creek that will hopefully be adopted by State and Federal Agencies (DHEC and EPA) that details an intergovernmental water quality improvement program to make our creeks safe for swimming, boating, fishing etc. I have read a draft of the TMDL (total daily maximum load allowed of pollutants) and feel that this offers the best short-term solution for our area."

Richards Gregory:

"I have lived on James Island Creek (Ellis Creek) for over 12 years. I'm an avid boater and I enjoy jumping off my dock and the boat into the water. I have not been able to do this for many years. The fecal bacteria levels are incredibly high. I want DHEC to make James Island Creek and Shem Creek safe for swimming again."

Kathy Greider:

"We need to make and keep all our public waterways clean. Safe for our children and our fish."

Tyler Grespin:

"I'm writing in support of the Charleston Waterkeeper's mission to secure cleaner coastal waters in Charleston County. I would like to support their mission to see Shem Creek and James Island Creek safe and healthy swimming venues. As a representative of the East Cooper Land Trust, also a local environmentally conscious non-profit organization, I hope to see SCDHEC take their mission into consideration."

Carol Gross:

"I want James island and Shem creek safe for. Swimming"

Kaitlyn Hackathorn:

"Shem Creek and James Island Creek are the centerpieces of our community. They represent Charleston for both natives and visitors alike. I grew up swimming, kayaking, and catching seafood in these waters. Please help us to protect them. I truly believe that the history and future of our community lies in the protection of these waterways."

Lisa Hakamiun:

"I would like to see our waterways clean and safe for us and future generations. Thank you so much for what you do to keep everyone safe."

Lyndsay Hall:

"I have been a resident of the Charleston area for over 15 years - within that time Charleston Waterkeeper started testing the sites off Shem Creek and James Island Creek. Both of these sites are consistently unsafe for swimming. Having safe water, especially in South Carolina during summer, is an easy way to cool down and is a great activity for young children to enjoy. Its unfortunate that the bacterial levels continue to be unsafe - its time to act on this. Please clean these sites up!"

Tyrone Hanlan:

"I strongly believe in this push for improvement to water quality in both of these bodies of water."

Gerald Haram:

"Please act to clean up Shem and Ellis creeks. I live on Milton creek on edisto island and know the importance of fishable and swimmable water that is safe for recreation. It is the foundation of our tourist economy."

Meagan Harper:

"My name is Meaghan and I spend lots of time enjoying our beautiful Charleston waterways. It's so peaceful to look out at the water, see dolphins and other wildlife, and enjoy the tranquility it provides."

Kevin Hayes:

"As a local resident and lover of the Low Country I am asking you please help us get our water ways cleaned up and sustainable. I love to crab, fish, shrimp, swim, kayak, and spend my time on our beautiful waters. Without them being clean and safe, I can't enjoy them, nor can our future generations."

Melissa Hayes:

"I've been living in the low country all my life. I love this area and hope to never leave because of one thing alone: our community's relationship with the salt water. I can't imagine leaving these beautiful marshes and beaches. Some of the best moments of my life include them. That being said, I'm writing to support any initiatives to make Shem Creek and James Island Creek safe for swimming so that others can enjoy our waters in the same way that I have. In addition, I think it's crucial that we care for our environment, so it can remain a resource to us for fishing, crabbing, and oystering. Please help our community by working toward cleaner, healthier waters."

Karen Henderson:

"I want to see Shem Creek and James Island Creek safe and healthy for swimming."

Franny Henty:

"Please clean up James Island and Shem Creek asap. Please inspect all septic systems in the vicinity. Furthermore please limit any development until these creeks are safe to swim again. Thank you ever so much."

TL Herbert:

"I live on James Island/Ellis Creek (for 33 years!) and have worked to keep my area clean of trash, tires. But nothing seems to help the bacterial levels - they never seem to go down making the creek a clean place to swim. Friends across the creek go in on high tide and they have lots of ear infections. Please help clean up James Island/Ellis Creek - I'd love to be able to swim in it!"

Carol Jackson:

"Thank you, Ms. Varlik and DHEC team, for creating this Draft TMDL as it will prompt a measurable process to clean up James Island Creek from the pollutants we know from Waterkeeper documented readings are the most prevalent in our local stormwater drainage system and connected waterways. We want and need a much cleaner Creek to facilitate the active use of the James Island/Ellis Creek waterways for human enjoyment. As importantly, we need a cleaner creek to ensure the future of our ecology in and along the Creek and abundant wetlands as a contributor to our area's clean air estuary. We look forward to staying up to date with the process that you are coordinating with DHEC, EPA and regulatory jurisdictions. Please call on me to help with local government involvement and as a resource for citizen engagement."

"I'm sending my second message through Charleston Waterkeeper format to support their citizen education efforts to keep our James Island/Ellis Creek clean for my grandson's

future as resident of our watershed area. My husband and I are active Waterkeeper supporters; helping out with shore clean up activities and adopting our ditch and local street to prevent runoff to the best of our ability as the sea level rises. We look forward to engaging our Bay Front neighborhood neighbors in the long term improvements can help DHEC and local government achieve with citizens support."

Liz Jannetta:

"Thank for your ongoing support and efforts to keep Shem Creek and James Island Creek safe and healthy for swimming."

Chris Jude:

"My wife and I moved to Charleston in 2017 from North Carolina. At first we worried that we wouldn't have as many chances to get out doors here, until we joined a Coastal Expeditions kayaking trip on Shem Creek and into Charleston Bay. Since then we've used the rivers and waterways in the area as our recreation, and it's been great. The problem is, the pollution in these areas concerns us for swimming and what effect it may have on the wildlife that makes the low country so special. Please direct resources towards Shem Creek and James Island Creek water quality, they are vital resources to our community."

Katie Koval:

"I live on Ellis Creek, and it is such a shame that it is so dirty. We don't feel we can swim there with the levels of bacteria. We moved there to have water access but with the safety concerns, aren't able to use it."

Judith Kramer:

"Thank you for the work you do to keep South Carolinians safe and healthy in our beautiful environment. Towards this end, Especially as a kayaker, I wholeheartedly support DHEC's plan to clean up Shem Creek and James Island Creek (Ellis Creek) which will contribute to the health of all those living on, by, or in these waters."

Hannah Kuhl:

"I have been studying James Island Creek as part of my thesis project to earn my Masters in Environmental Studies at the College of Charleston. I have seen and studied some of the impacts of various forms of pollution in this creek first-hand, and definitely think something needs to be done about it. I have talked to residents in the area who still rely on this waterbody as one of their primary sources of protein, and may not be able to

afford otherwise. This is simply unsafe with the current water quality, and these citizens also need to be educated on this matter. In addition, the high levels of bacteria are making it unsafe for others to enjoy the creek by kayaking, swimming, etc. This has been a part of the James Island/lowcountry culture for a long time, and we cannot allow this to be lost forever."

Nathan Leach:

"I support any effort to make Charleston's waterways safer and cleaner. The creeks around the area are a great way to cool off in the hot summer months, and it'd be a shame if we can't utilize our natural resources around us if the bacteria levels make it unsafe to do so. I've been enjoying those small pleasures for years and wouldn't want to stop now."

Luke Levanchy:

"With the majority of locals unanimously fighting for safer cleaner water availability. I urge you to strongly consider taking proper precautions to protect our waterways and estuaries. Let's show visitors why we live in such a special place."

Bryan Luce:

"Although the aerial map I made of James Island Creek by drone is no longer available online, here is a link to the blog post: <https://naturelovesdata.wordpress.com/portfolio/james-islandcreek-ellis-creek/>"

Bobbie Lyon:

"Please take the necessary steps to make Shem Creek and Ellis Creek safe for swimming again. As an avid paddleboarder on James Island it is scary to think what I could catch in that creek were I to fall in. And on hot summer days it is a shame to not be safe to get off my board and take a dip in the creek. Our waters are all connected and left unresolved this is likely to become an expanding problem."

Deanna Maguire:

"I am passionate about Charleston waterways, and keeping them clean and safe is a priority. Swimming and fishing are my favorite activities, and just simply put, that is why we need to keep waterways clean."

Jennifer Mathis:

"Thanks for the quick response. I am not sure why it went through without a message but the essence of my email is to advocate for Charleston Waterkeeper and the work they

have been doing to monitor water health. For you all to hear citizen voices supporting waterways that are clean enough to swim and fish in. Thanks for listening."

Kathryn Matrangola:

"Dear Ms. Varlik, I hope for a cleaner waterway to share with the next generations and encourage an active outdoor life! Thank you"

Mike McCarthy:

"Dear Ms. Varlik, Charleston Waterkeeper's testing revealed that Shem Creek and James Island (Ellis) Creek don't meet state water quality standards for safe swimming due to high levels of bacteria. The DHEC clean up efforts are an important step in making both creeks safe for swimming. Thank you for taking action, and making our waterways clean again. Please make an effort to make the public aware of what they can do to clean up and help maintain the cleanliness of the creeks. Thank you"

Jerilyn McCombs:

"Dear Ms. Varlik, These creeks see far too much boat traffic & perhaps runoff from businesses along the waterway. Please regulate our creeks which are home to wildlife."

Sarah McKenna:

"Dear Ms. Varlik, I am a Mt. Pleasant relative and long time creek lover. Along with countless neighbors, friends, and community members, I want to see Shem Creek and James Island Creek safe and healthy for swimming and kayaking. Being outside is critical for my mental health along with many others. Summertime just isn't the same when the water is too toxic to endure. Please help us save our waterways. Thank you."

Savannah McLain:

"Dear Ms. Varlik, We urgently need to protect our water systems. Not only for the people that swim and boat in it, but for the animals that live there and rely on it. We will not get back this ecosystem if we do not protect our water. Please help us get this water clean for future generations. Thank you"

Sean McQuilken:

"As a marine biologist who has literally spent thousands of working hours on waterways from Texas to Cape Cod I have seen firsthand the effects of water pollution. I am urging you to pass protections that would clean up Shem Creek and James Island Creek and make them safe for swimming. I personally kayak and paddleboard on Shem Creek and have friends/ family who use James Island Creek. For far too long there have been water

quality issues with both of these creeks. If we pass and enforce protections for these two (and other bodies of water) they will become healthier for people and animals which will contribute beneficially to our economy as tourism is a major industry in the Charleston area. Thank you"

Alicia Mendicino:

"I am writing to let you know of my concern regarding water quality on both Shem Creek and James Island Creek. As a long time resident of Mt. Pleasant and frequent visitor to James Island, I have always appreciated the beauty of both waterways and the many activities for which they are a haven. I am an avid paddleboarder and am now reluctant to use Shem Creek due to the high level of bacteria in the water. I understand the same is true of James Island Creek. As a South Carolina resident yourself, I am sure you want all of us to be able to enjoy what nature has so abundantly provided us...clean water. I hope you will make cleaning the two waterways a priority! Thank you"

Christine Mooberry:

"Dear Ms. Varlik, I ask that you would prioritize the cleanliness and health of the local waters and environment! We love the beauty of our environment and would appreciate efforts to keep it clean and healthy! Thank you"

Kathryn Mundy:

"Dear Ms. Varlik, Thank you for helping to make James Island Creek and Shem Creek safer for me and my friends to kayak and swim in! I love living in the low country and being able to SAFELY enjoy the tidal creeks and marshes is definitely one of my favorite parts of Mount Pleasant and James Island. Thank you"

Melissa Myers:

"Dear Ms. Varlik, I want to see Shem Creek and James Island Creek safe and healthy for swimming. I'm a frequent paddler on the creeks and want to continue this. Please support clean creeks. Thank you"

Elizabeth Nemeth:

Dear Ms. Varlik, I am writing to voice my support for clean water for Shem Creek and James Island Creek and all of Charleston's tidal creeks. I live on Longbranch Creek in West Ashley and fish, crab, and shrimp the creek; you can find me on the dock wearing my Cajun Reebok's (aka white shrimp boots) most evenings. Our waters are precious- and I wholeheartedly support initiatives to set water quality standards for safe swimming and fishing. Thank you so much for your leadership in preserving the health of our waterways.

Jill Norton:

" Dear DHEC, PLEASE PROCEED IN TIMELY AND EFFECTIVE ACTIONS THAT WILL CLEAN UP THE SHEM CREEK AND ELLIS CREEK FOR THE CHARLESTON COMMUNITY OF WATER ACTIVITIES LOVERS! Thank you"

Dusty Parker:

"Dear Ms. Varlik, I'm sure that you would agree with me that safe, clean oceans and creeks are important. I strongly support DEHC in efforts to clean our local Charleston county area creeks to meet state water quality standards for swimming, especially Shem Creek And Ellis Creek. It's not just important for today, but for future generations to enjoy. Thank you for your time and consideration."

Blake Pearce:

"Dear Ms. Varlik, Please do something about the bad water quality standards in James Island Creek and Shem Creek! Thank you very much. Thank you"

Jessica Peragine:

"Dear Ms. Varlik, As a local and environmentalist, I do my part to help better our lands and waterways and to teach others about the importance of a healthier earth. One of my current concerns is to see Shem Creek and James Island Creek safe and healthy for swimming again and to protect those living in these ecosystems above and below these waters. Many fish, sea birds, and marine mammals are affected too. Yet run-off pollution from roads after storms and waste from boats aid in the reproduction of harmful bacterias which make these waters uninhabitable for animals and unsafe for human aquatic activities. Please help all affected parties be able to safely enjoy these waters again today and for future our generations. Thank you"

Kate Pfile:

"I am a resident of James Island and have the privilege of living on Ellis creek. As a member of CHARLESTON Waterkeepers, I receive a weekly update on the bacteria levels of the local waterways. Week after week the testing site on Ellis Creek is red. This concerns me because this means the water that I moved to be near is not safe when my husband and I go paddle boarding. I am pleased to know DHEC is assessing this situation and urge you to take the necessary steps to making Ellis Creek clean and safe for everyone. Let me know how I can assist you with these efforts."

Stephanie Ragsdale:

"Dear Ms. Varlik, Every body of water should be accessible for safe wading and swimming. We have to stand up before these things are no longer an option. Thank you"

Emily Randisi:

"Dear Ms. Varlik, Please help preserve Shem Creek and James Island Creek and keep them safe and healthy for swimming. As a DHEC employee, it is your professional obligation to keep the public safe from poisons they neither agreed to, nor were warned about. If there is anything people like myself can do to aid in this effort, please do your best to let us know. We support you and we have put our trust and our health in your hands. Thank you"

Christine Magnarella Ray:

"I live on James Island because I love the salt marsh and tidal creeks that thread their way through our neighborhoods. I believe that these creeks, which are valuable nurseries for many ocean animals, should be kept healthy and clean. Our resident dolphins swim and fish in James Island Creek. We James Islanders also swim and fish in the creek. James Island Creek should be safe for us too."

Harriet Reavis:

"Dear Ms. Varlik, I am President of the Marlborough Neighborhood Association on James Island, and we would like to ask for your help in making Shem Creek and Ellis Creek safer. We are counting on you to make sure our waterways are as clean as possible. Thank you"

Sarah Romano:

"Dear Ms. Varlik, I am a mother, an educator, and an avid paddle boarder. I need our local water sources to be safe for all of those reasons. Thank you"

Irene Rowe:

"Dear Ms. Varlik, I am concerned about the water quality of Ellis creek on James Island and Shem Creek In Mount Pleasant. Clean water is imperative. I am hopeful that you are moving to improve the water quality of these two creeks. Thank you"

Maureen Ryan:

"Dear Ms. Varlik, Please Please Please help our creeks. We need to be able to know that we will not get sick because of bacteria levels in our creeks. Please help us have clean water!!! Please! Thank you"

Lisa Scharin:

"Dear Ms. Varlik, The quality and conditions of water in Shem Creek and James Island Creek are a tragedy and an absolute shame, a sin-really!!! These bodies of water are a major attraction for tourists and locals who love paddle boarding, kayaking, canoeing, bird-watching and dolphin watching. Shem Creek is also a focal point for people who want to dine on the water and enjoy the sunset, and watch people enjoy water activities while relaxing at Vickerys', Reds, and the other restaurants along the creek. How horrible that the bacteria in this water is so high-it is a dangerous to swim in and I fear for those who paddle board if they fall into it! YOU should TOO!!! I also have seen enough people fishing and crabbing in this water-they should be warned and aware! This is a health issue and an issue of respect for our environment, wildlife and human rights to be able to enjoy their communities, vacations without fear of getting sick!!!! PLEASE do ALL you can to CLEAN UP these very important bodies of water-as you know-they are connected to other water sources and the ocean too! Thank you"

Michael Shinall:

"Dear Ms. Varlik, Please take the necessary actions to ensure these beautiful waters receive the care they deserve. As I'm sure you are aware, Shem Creek plays a critical role in our local economy and provides family, friends and visitors a place to relax and share memories. Similarly, James Island Creek is home to several Charleston families where it is not unusual to find people fishing, lounging and swimming. Please take all of these aspects into consideration. Thank you for all of your help!"

Parker Singleton:

"Dear Ms. Varlik, I highly applaud and support cleaning up Shem and Ellis creek. I have frequented these beautiful tidal creeks since I was a young boy on vacation with my parents. Now I live here. The constant development troubles me that we are not prioritizing maintaining a pristine environment and that we will soon lose what took millions of years to evolve and develop. Cleanliness allows people to enjoy and appreciate the beauty of these waters and to have more reason to preserve them."

Rob Spawar:

"Dear Ms. Varlik, Thank you for your efforts to clean up our waterways. Especially JI Creek and Shem Creek where we know they need help our and our help. Thank you"

Jeanne Sprott:

"Dear Ms. Varlik, I just wanted you to know that I and my family support DHEC setting targets to clean up Shem Creek and Ellis Creek. They are important recreational resources for our wonderful state. Thank you"

Christina Stanton:

"Dear Ms. Varlik, Please work to keep our water clean. Our ecosystem is a fundamental part of our economy and our society. This is a holistic issue. You need to demonstrate your ability to lead on this front. Thank you"

Cris Sumpter:

"Dear Ms. Varlik, Please help us keep our waters in good health. I have surfed,fished,and kayaked these waters for fifty years. I also am a Creek Watcher with Waterkeepers of Charleston and do a lot of work with DNR in the SCORE program. Obviously the health of our waters is very important to me. Thank you"

Susan Thompson:

"Dear Ms. Varlik, DHEC is setting clean up targets for both creeks. This is an important step in making both creeks, where we live safe for swimming! Please move forward with this effort. Thank you"

Mike Tinkey:

"Dear Ms. Varlik, Please clean up these two popular and iconic creeks We have lived in the Old Village for 36 years and have enjoyed Shem Creek with our children, grandchildren and family. Now with the increases of uses of of the Creek it is important to protect the flora and fauna as well as the water quality for all."

Chris Toler:

"Dear Ms. Varlik, I'm writing to you today to voice my support for cleaner, healthier waterways when it comes to Ellis Creek on James Island and Shem Creek in Mt. Pleasant. As an avid waterman that fishes and paddles both of these waterways, cleaning them up is of the utmost importance to me, my family, and my neighbors. Thank you"

Benjamin Toy:

"Dear Ms. Varlik, I want clean up our creeks Thank you"

Phil Turner:

" Dear Ms Varlik, As a Charleston resident and someone who is out on our rivers and creeks several times a week, I strongly support the proposed mandatory testing and standards. This is essential to protecting the health of our citizens. Thank you"

Christine von Kolnitz:

"Dear Ms. Varlik, I live a few blocks from Shem Creek. I do not have pets that would contribute to poor water quality, I do not use fertilizers or pesticides and I capture rainwater from my roof. I know that other neighbors and businesses can do better and can be taught how to help clean up the creek. I am writing today to ask DHEC to get involved in the clean up efforts for Shem Creek and James Island Creek. These creeks contribute food, economic benefits and quality of life benefits for so many. The animals, plants and people that rely on them deserve clean water. Thank you"

Theodosia Wade:

"Dear Ms. Varlik, We are very concerned about the water quality of our creeks and rivers around James Island and the low country. As we experience more rain higher tides flooding issues increase and along with that water quality is affected. Old and or faulty Septic systems also impact our creeks along with runoff."

Kris Wetzel:

"As a resident of Folly Beach and James Island, my family and I spend a lot of time at the beach and James Island Creek. Let's work together to ensure that all of our waterways stay safe and clean for everyone. Thank you so much for your service!"

Ian Wheeler:

"Dear Ms. Varlik, Our waterways are the greatest asset we South Carolinians have. Clean water is, and will increasingly be, a far more important and enticing element in attracting newcomers to S.C., and S.C.'s overall value proposition, than any politician, corporation or business entity. I want to see Shem Creek and James Island Creek safe and healthy for swimming... Not just because it's the right thing to do for our kids, but also because quality-of-life is an increasingly scarce economic resource in the U.S. If we can't do the

right thing simply because it's the right thing to do, perhaps we can at least do it because the economic prosperity of South Carolina and its residents are at stake. Thank you"

Brian Wildstein:

"Dear Ms. Varlik, Please set clean water standards for our creeks. We must protect our waterways. Thank you"

Richard Williams:

"I live on James Island for decades, and spend time in and near the local waters. I very much care about clean water for swimming and kayak paddling. We need to keep the water safe and clean."

Glenn Williman:

"Dear Ms. Varlik, Please set up thresholds for bacteria in Shem Creek and James Island Creek. As a boater, safe swimming water is not just nice to have, it is necessary for water recreation to prevent disease in people and pets. Thank you"

Carrie Wilson:

"Dear Ms. Varlik, Our family implores you to make every effort possible to help keep our oceans and waterways clean. It is imperative to pass laws to educate people on how to do this. Sadly people do not know unless they are taught or held by our government agencies to do so. Thank you"

Mary Wofford:

"Dear Ms. Varlik, I want to voice my support for DHEC's efforts to clean up James Island Creek and Shem Creek! Thank you"

Elizabeth Zsolnay:

"Dear Ms. Varlik, As waterfront Old Village residents and avid boaters We care about the lowcountry's waterways and the safety of friends and family who also recreate in them. Charleston Waterkeeper's continued testing has revealed that Shem Creek and James Island (Ellis) Creek don't meet state water quality standards for safe swimming due to high levels of bacteria. DHEC setting clean up targets for both creeks is an important step in making both creeks safe for fishing and swimming. Thank you"

Department's Response to Comments Above:

South Carolina Department of Health and Environmental Control (SCDHEC, the Department) appreciates your support, and taking the time to comment on the draft James Island Creek and/or Shem Creek Enterococcus Total Maximum Daily Load (TMDL) documents.

SCDHEC's mission is "To improve the quality of life for all South Carolinians by protecting and promoting the health of the public and the environment". To that end, various tools that are available to us are used, several of which are explained below.

One of these tools is, South Carolina Water Classifications and Standards, Regulation 61-68. These regulations were published in agreement with SC Pollution Control Act, available at: https://www.scdhec.gov/sites/default/files/media/document/R.61-68_0.pdf. These regulations establish a framework for managing and protecting the state's waterways. Classifications and standards relating to waterbodies can be found in this document. For example, James Island Creek is classified as SA recreational salt waters. Based on this classification, the water quality standard for enterococcus specifies that a geometric mean of samples taken within a 30-day period should not exceed 35 mpn/100 ml, nor should any one sample taken on a given day should not exceed 104 mpn/100 ml. Similarly, Shem Creek is classified as SB recreational salt waters. Based on this classification, the water quality standard for enterococcus specifies that a geometric mean of samples taken within a 30-day should not exceed 35 mpn/100 ml, nor should any one sample taken on a given day should not exceed 501 mpn/100 ml.

Another tool available for the Department is the §303(d) List of Impaired Water. The Department evaluates and assesses the quality of SC's waterways every two years. If the water quality standards for a classified waterbody are not met (i.e. impaired), these waters are included in the §303(d) List of Impaired Waters.

Once a waterbody is included on the §303(d) List of Impaired Waters, a total maximum daily load (TMDL) must be calculated for the pollutant of concern and documented in a TMDL document. TMDL documents also provide an inventory of potential sources of pollution, quantify total reductions that are needed to attain water quality standards and provide guidance for remediation.

The Charleston Waterkeeper (CWK) organization has been analyzing weekly bacteriological samples collected from tidally influenced creeks around the Charleston area since 2013. The CWK collects these samples from May through October (the typical recreational season in SC) and determines if the recreational use is being met in these

waters. After two years of sampling by the CWK, data showed that both James Island and Shem Creek are impaired for exceeding recreational use enterococcus water quality standards.

As early as 2014, the Department began to have discussions with stakeholders regarding the potential for developing a TMDL document or an alternative restoration strategy for both creeks.

Following a presentation by Cheryl Carmack of the CWK to some of the residents of James Island Creek, the Department received a petition to develop a TMDL for James Island Creek (November 10, 2014). This petition was coordinated by Ms. Mary Edna Fraser, a resident of James Island Creek.

The CWK organization initially requested that the Department develop an alternative restoration strategy for Shem Creek watershed (October 28, 2014). Ultimately, the CWK and the permitted MS4s within the Shem Creek watershed decided that developing a TMDL document would be the more appropriate path towards restoration of recreational use in Shem Creek.

In order to calculate a scientifically defensible TMDL, additional data were needed. During the time frame from receiving the request/petition and leading to the development of the 2016 §303(d) List of Impaired Waters, the Department assigned a priority rank of "1" for both James Island Creek and Shem Creek, which meant that TMDL development was being targeted for the calendar years 2016-2018. The 2016 §303(d) List of Impaired Waters and statewide priority rankings for all impaired locations were subsequently approved by US Environmental Protection Agency (US EPA) Region 4 on June 22, 2017.

Following the commencement of the James Island Creek and Shem Creek TMDL documents on June 1, 2016, Ms. Fraser provided back ground information about James Island Creek such as its historical use for ferrying goods to and from Charleston peninsula, describing potentially problem areas around the watershed, as well as other relevant information. Other stakeholders provided local knowledge regarding both watersheds during the same time frame. As each TMDL document was drafted, the Department collaborated with the CWK and other regulated MS4s with jurisdiction in each watershed. These were the City of Charleston, Charleston County, SC Department of Transportation, the Town of James Island, and the Town of Mt Pleasant.

Pollutant sources can generally be classified as either point source or nonpoint source:

- 1) There are two types of point sources, continuous or non-continuous: Discharges from pipes owned and operated by industrial, domestic, and municipal wastewater dischargers are continuous discharges.

Point sources are permitted by the Department under National Pollutant Discharge Elimination System (NPDES) permits. If these facilities are discharging wastewater that meets their permit limits, they are not causing or contributing to impairment. If any of these facilities are not meeting their permit limits, enforcement actions/mechanisms are in place. Currently, there are no wastewater facilities permitted to discharge treated effluent in either James Island Creek or Shem Creek.

Stormwater discharges are categorized as non-continuous, because they discharge in response to rain fall or snow melt. Depending on population size, some municipalities also have NPDES permits, called Municipal Separate Storm Sewer System (MS4) permits. Within the James Island Creek TMDL watershed, there four MS4s: The City of Charleston, Charleston County, SC Department of Transportation (state wide permit), and the Town of James Island. Within the Shem Creek TMDL watershed, there three MS4s: Charleston County, SC Department of Transportation (state wide permit), and the Town of Mt Pleasant.

- 2) Non-point source (NPS) pollution is generally a result of precipitation, deposition from air, seepage, or hydrologic modification. The cause of NPS pollution is precipitation moving over land and picking up and discharging natural or manmade pollutants to nearby waters, such as James Island Creek or Shem Creek. Several examples of NPS of pollutants can include:
 - a. Bacteria and viruses from pet poop left on the lawns, streets, or dumped into storm sewers,
 - b. Bacteria and viruses from malfunctioning septic systems,
 - c. Bacteria and viruses from wildlife poop,
 - d. Bacteria and viruses from illegal discharges of sanitary waste from boats.
 - e. Bacteria and viruses from poorly maintained marine sanitary devices,
 - f. Resuspension of bacteria containing sediment by boats, jet skis, and water skiers not abiding by "no wake zone" speed limits,
 - g. Bacteria and viruses from improperly maintained sewer lines,
 - h. Eroding stream banks,

- i. Excessively applied lawn fertilizers, insecticides, and herbicides from backyards and gardens,
- j. Oil, grease, antifreeze, transmission fluid, and other toxic chemicals deposited by vehicles on roads and these pollutants being carried to nearby waters as a result of rain or melting snow.

The Department believes majority of the sources contributing to enterococcus exceedances are caused by pollutants entering both James Island Creek and Shem Creek through NPS as described in #2, above.

We encourage local stakeholders to partner with organizations such as the CWK, local municipalities, sewer districts, and engage in initiatives to reduce the nonpoint sources of bacteria.

Often times, we don't realize the harmful impacts of our actions on water quality. But, the great news is these impacts can be reduced by educating ourselves and implementing these small but impactful actions. Implementing these incremental actions changes will help improve the water quality in both watersheds and help ensure that the recreational use water quality standard is being met. A few examples are given below:

- i. As pet owners, picking up after our pets, especially dogs, and removing poop from everywhere including back yards, dog parks, sidewalks, street, etc., and properly discarding the poop in the trash, or installing or building pet waste digesters in our yards.
- ii. Regularly having septic tanks inspected and repaired as needed. If feasible, connecting to the local sewer collection system.
- iii. Discouraging feeding wildlife,
- iv. Using appropriate best management practices (BMP) to discourage roosting of birds on porches, eaves, canopies, docks, dock roofs and railings, and other hard, impervious surfaces, hence reducing the amount of bird poop entering our waters.
- v. Having riparian buffer areas in our yards, especially adjacent to creeks. These vegetative areas buffer pollutants from reaching surface waters such as James Island Creek. Planting native vegetative in these buffer area reduces the watering rate, thus reducing runoff that pollute our waters.
- vi. Abiding by "no wake zone" speeds while boating, water and/or jet skiing, reduces the resuspension of bacteria containing sediments, and reduces the erosion of stream banks.

- vii. Cleaning off of crabbing/shrimping/fishing waste off of docks and disposing of such waste in the trash prevents attracting wildlife which reduces the amount of bacteria from their poop.
- viii. Making certain to close the lids of garbage bins and dumpsters to prevent wildlife, such as racoons, from accessing trash.
- ix. Properly maintaining our marine sanitation devices and refraining from dumping in our waters. Charleston Waterkeeper has a free and reliable pump out service, where they can set you up with a regular pump out schedule or on as needed basis. To get on Captain Herman Miller's schedule, please call him at 843-608-9287 (<http://charlestonwaterkeeper.org/who-we-are/team/>)

Responses to other comments

Mary Arnold Comment One:

"As a youth I swan in the James Island Creek. I now live off a tributary of Shem Creek. I paddle board often from my dock on Shem Creek. When paddling in Shem Creek my boards get coated in a brown film. That happens nowhere else that I paddle in the area. I sit on the end of my dock and watch the tides come and go with a top skin layer that appears to the eye to be some sort of pollutant. I have a friend that is a prone paddler that often put in at the Shem creek boat landing She became sick and was ultimately diagnosed with lead poisoning. It was opined that she contracted the disease from paddling in Shem Creek. Thus all assistance cleaning up these creeks would be greatly appreciated."

Mary Arnold Response One:

The James Island Creek Enterococcus TMDL Document evaluates only the existing bacteria levels in James Island Creek. It is important to note that this document does not address other pollutants. Currently, there are no documented exceedances of lead in James Island Creek.

Mary Edna Fraser Comment One:

"Dear Ms. Varlik, I live on James Island Creek and started getting ear infections and sore throat in 2012. Please consider the animals at the Wag Factory and overflow from the Dog Park. We know sewage is going into our creek with high tides it just pours out. We appreciate your efforts to bring back clean water for all. Thank you"

Mary Edna Fraser Response One:

The James Island Creek Enterococcus TMDL Document evaluates existing instream bacteria levels, provides guidance for the improvement of bacteria levels necessary to achieve the recreational use water quality standard. National Pollutant Discharge Elimination System (NPDES) permitted non-continuous point sources, such as small MS4s, construction and industrial activities identified in the draft TMDL document will continue to be addressed through existing and future permits and may be subject to compliance and enforcement mechanisms. Nonpoint sources identified in the TMDL document may be addressed through volunteer efforts. Grant opportunities may be available through the Department as Clean Water Act §319 grants. We encourage local stakeholders to pursue these grants and other initiatives to implement the nonpoint sources of bacteria, such as pet waste in owners yards, malfunctioning septic tanks, discontinuing the feeding of wildlife, using appropriate best management practices to discourage roosting of birds on docks and its railings.

If undocumented sources of bacteria are observed by you or other local stakeholders in the watershed (i.e. sewage), you are encouraged to contact the local SCDHEC regional office located at 1362 McMillian Avenue, Charleston SC at (843) 953-0150. The local office should be able and investigate your concerns.

Mary Edna Fraser Comment Two:

I would like to add that the Wag Factory and County Dog Park also send pet waste into our creek. Every time we have high tides septic is spilled in at Harborview and Centerville Roads and has been reported by concerned citizens for years now. Thank you for doing this study as I live on James Island Creek with my husband John Sperry and the pollution levels are measured on my dock. We appreciate your efforts and applaud the Charleston Waterkeeper and SC Coastal Conservation League and all those who care about our health on James Island Creek.

Mary Edna Fraser Response Two:

SCDHEC appreciates your support. SCDHEC does not regulate development, review zoning decisions or issue local ordinances in these watersheds. For James Island Creek enterococcus TMDL area, local jurisdictions are City of Charleston, Charleston County, and Town of James Island. SCDOT is also a permitted MS4 entity within the watershed.

Local businesses, such as Wag Factory, are not regulated by SCDHEC. Based on the current MS4 boundaries, Wag Factory is within the jurisdictional boundary of Town of

James Island. We suggest you contact Town of James Island directly regarding your concerns.

James Island County Park is located within the unincorporated area of Charleston County. The dog park is surrounded by a retention pond, which does not discharge to storm sewers. For further information please contact Charleston County Parks and Facilities regarding enforcement of pet waste pick up rules, and regarding the sampling efforts from the retention pond and sampling results. County Parks and Facilities are available at: <https://ccprc.com/>

During the drafting of the James Island Creek TMDL document, the Department worked closely with City of Charleston, Charleston County, Town of James Island, SCDOT, and Charleston Waterkeeper. There were several meetings, site visits, information exchanges, and all parties worked collaboratively to delineate the James Island Creek watershed. During one of the meetings, issues regarding septic tanks such as their locations, age, and maintenance was discussed. Jurisdictions shared available data with the Department for analysis. The analysis results, along with a map (Figure 10), can be found in section "3.2.4 Failing Septic Systems" of the TMDL document.

Depending on the jurisdictional area, the Centerville area and along Harborview Road are served by either James Island Public Service District or Charleston Water System. Based on information available at time of TMDL development, there are currently no onsite septic systems in the Centerville area and along Harborview Road. However, to the west of Folly Road, to the north and north-northwest of James Island Creek and to the north-northwest of Dills Bluff Road, there are numerous onsite septic systems currently in use. The Department does not inspect septic tanks after they are installed unless complaints are brought to the attention of the local SCDHEC Office. It is the responsibility of property owner to have their septic system and drainfield inspected annually, maintain it properly, and have regular pump outs. Functionality and maintenance status of onsite septic systems currently in use within the James Island Creek TMDL watershed area is unknown.

If undocumented sources of bacteria are observed by you or other local stakeholders in the watershed (i.e. failing septic tanks), you are encouraged to contact the local SCDHEC regional office located at 1362 McMillian Avenue, Charleston SC at (843) 953-0150. The local office should be able and investigate your concerns.

Jay Rucker Comment One:

"I live on the upper portion of Ellis Creek. My children routinely swim in the water and so we are thrilled to hear DHEC is taking steps to improve the creek's water quality. I am

familiar with what I think is an undocumented septic tank bordering Ellis creek. Who can I contact to have this looked into?"

Jay Rucker Response One:

SCDHEC issues permits for the installation of septic tanks in the State. For additional information see: <https://www.scdhec.gov/environment/your-home/septic-tanks>. In Charleston County, the regional office located at 1362 McMillian Avenue can be contacted directly at (843) 953-0150. The local office should be able and assist you with regards to undocumented septic tanks.

Incomplete Comment Submittals:

Kimberly Imbus Comment One:

"Dear Ms. Varlik, [your message here] Thank you, [your name here]."

Kimberly Imbus Response One:

SCDHEC attempted to reach the commenter for further clarification after receiving the initial message on 06/12/2019. The Department did not receive an additional response.

Patricia Luck Comment One:

"Dear Ms. Varlik, [your message here] Thank you, [your name here]."

Patricia Luck Response One:

SCDHEC attempted to reach the commenter for further clarification after receiving the initial message on 06/12/2019. The Department did not receive an additional response.

Gustavo Serrano Comment One:

"Dear Ms. Varlik, [your message here] Thank you, [your name here] Gustavo Serrano"

Gustavo Serrano Response One:

"DHEC: Mr. Serrano, I believe you meant to send me comments, however I have not received it (see below). If you would like to send your comments, I would encourage you to do that by 5 pm, June 14th.

Gustavo Serrano Comment Two:

"Realized that after I sent it, sorry about that..."

Gustavo Serrano Response Two:

SCDHEC attempted to reach the commenter for further clarification after receiving the initial message on 06/12/2019. The Department did not receive an additional response.

EXHIBIT G



Well Siting & Potential Contaminants

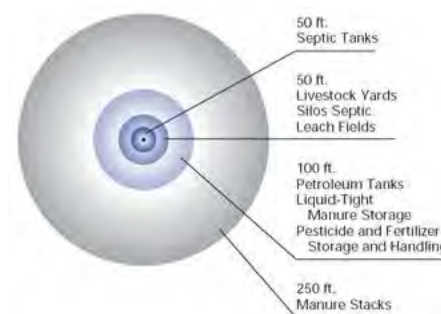
Well Siting (Location)

The safety and effectiveness of a well depends greatly on its location.

It is important to maintain safe distances between private ground water wells and possible sources of contamination.

Possible sources of contamination and minimum distances from wells include:

- Septic Tanks, 50 feet from well
- Livestock yards, Silos, Septic Leach Fields, 50 feet from well
- Petroleum Tanks, Liquid-Tight Manure Storage and Fertilizer Storage and Handling, 100 feet from well
- Manure Stacks, 250 feet from well



Potential Contaminants

Ground water can become unusable if it becomes polluted and is no longer safe to drink. Contaminated ground water can be the result of:

- Microbial contamination (fecal contamination from feedlots)
- High concentrations of naturally-occurring contaminants, such as [arsenic](#) and [radon](#) (depends highly on the geology of the land surrounding the well)
- Local land use practices (fertilizers and pesticides)
- Problems with the integrity of nearby on-site septic systems

To learn more about possible well water contaminants, or if you suspect your wellwater might be contaminated, visit our [diseases and contaminants](#) page.

Septic Tanks

One of the most common sources of well water contamination are failed septic tanks or septic systems. For information on private well water and septic tank considerations, please visit:

- [Your Septic System](#) (Water Systems Council) [PDF – 34KB]
- [Septic Systems](#) (National Ground Water Association)
- [Septic Systems – What to Do After the Flood](#) (Environmental Protection Agency)
- [Septic Systems – SepticSmart Home](#) (Environmental Protection Agency)

Page last reviewed: April 10, 2009

EXHIBIT H

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	
COUNTY OF CHARLESTON	)	NINTH JUDICIAL CIRCUIT
	)	
South Carolina Coastal Conservation League and Charleston Waterkeeper,	)	
	)	Case No. 2022-CP-10-05192
Plaintiffs,	)	
	)	
vs.	)	AFFIDAVIT OF
	)	SHARON E. RICHARDSON
South Carolina Department of Health and Environmental Control,	)	
	)	
Defendant.	)	
	)	

PERSONALLY APPEARED BEFORE ME, Sharon E. Richardson, who being duly sworn, states as follows:

1. My name is Sharon E. Richardson. I am over the age of eighteen (18) and suffer from no legal incapacity.
2. I currently reside in Spartanburg, South Carolina.
3. I am founder and president of Resilient Lands Matter, Inc. ("RLM"), a South Carolina public benefit corporation organized in 2020. The purpose of RLM is to generate a general public benefit to South Carolina residents by restoring, protecting, and conserving the natural land. The mission of RLM is to save land, restore resiliency, and drive capital to conservation and nature-based solutions for community impact. Our mission is advanced in a number of ways, including advising landowners on conservation strategies; advocating for improved standards for green infrastructure, nature-based investments, and market-based solutions; and improving resiliency literacy. In my role as president, I serve as an advisor, advocate, and activist for a carbon-neutral economy, ESG (environmental- social-governance) investments, and nature-based and green infrastructure solutions. RLM

routinely works with landowners, municipalities, conservation organizations, and state agencies. Impact includes protecting almost 5,000 acres in priority floodplain forests.

4. Since 2015, I have served on the Board of Directors for the Dorchester Trust Foundation. Dorchester Trust Foundation is a small non-profit organization that was created as legal non-profit entity obligated to steward Rosebrock Park, a public park located in the floodplain of the Ashley River. Rosebrock Park serves as a riverfront park in the Ashley Scenic River Corridor in Summerville, South Carolina.
5. I also currently serve on the South Carolina Floodwater Commission after being appointed to this role by Governor McMaster in 2018. The Commission works to provide solution-based discussions and to identify and implement short and long-term recommendations to alleviate and mitigate flood impacts to South Carolina, with an emphasis on holistic solutions that address changing conditions from the mountains to the sea. I served as a “Thought Leader” on two task forces: Living Shorelines and Beautification. These task forces identified a framework that strongly supported nature-based solutions to address issues related to flooding and water quality related to accelerating land use conversions and eroding shorelines along coastal communities, identifying solutions for incentivizing nature-based solutions that minimize adverse impacts to water quality functions.
6. Prior to my time at RLM, I earned a Bachelor of Arts (B.A.) in Psychology from Middlebury College, and a Master of Public Administration (MPA) from the University of Vermont, with a focus on Forested Wetlands and Watersheds.
7. I then worked for the Vermont Agency of Natural Resources’ Department of Environmental Conservation Water Quality Division, and was responsible for implementation of the Vermont Wetland Rules (Vt. Code R. 12-004-056) across the state.

Vermont's landscape includes wetlands that are mapped and protected by the State of Vermont for their recognized functions of water quality enhancement, flood storage capacity, groundwater recharge, wildlife habitat, and research opportunities.

8. I later moved to South Carolina, where I was employed by the Beaufort County Planning Department as Long-Range Planner and Northern County Planner from 1995 to 1996. During my time at Beaufort County, I advocated for and designed South Carolina's first River Protection Overlay District, a local measure adopted to prevent cumulative impacts to water quality. The Overlay District required riparian buffers and development setbacks along State Outstanding Resource Waters as a risk mitigation strategy to enhance the sustainability of the coastal economy and prevent water quality degradation from closely-sited development. Beaufort County subsequently expanded the Overlay District to the rest of the county's coastal waterways, which served as a model for other coastal counties.
9. I then worked for the Lowcountry Open Land Trust from 1996 to 1999, both as Executive Director and Director of Land Conservation. At the Land Trust, I broadened the organization's scope from "views and vistas" to landscape-scale conservation, and expanded our reach into coastal partnerships. At the Land Trust, I negotiated more than forty-five (45) voluntary conservation easements that limited future development and impervious surface conversions on more than 10,000 acres, in perpetuity.
10. From 1999 to 2018, I was an entrepreneur private consultant, working for variety of partners to provide conservation strategy resulting in the protection of more than 20,000 acres of land in South Carolina, leveraging federal funding for private/public partnerships to promote innovative wetlands protection and restoration.

11. I testified as a subject matter expert during the 2018 reauthorization of the SC Conservation Bank, and I have provided testimony at Legislative Committees in the House and Senate on voluntary conservation and its public benefits.
12. I have advised South Carolina leaders on several other nature-based policies that incentivize green infrastructure restoration, including the 2018 South Carolina Solar Habitat Act. I also served on the City of Charleston's Climate Action Plan Carbon Banking Committee in 2021.
13. I regularly provide speaking engagements in various forums—to include presentations to community groups and lectures at universities like the College of Charleston and Coastal Carolina University—on topics such as the intersection of wetlands, water quality, and flood risk mitigation and the cultural heritage of iconic landscapes. I have also authored or co-authored papers on the ACE Basin¹ and the Sea Islands.²
14. I have worked as a Conservation Practitioner in South Carolina for nearly three decades, advising and advocating on behalf of over 20 local and national conservation organizations, over 100 landowners, and many state agencies, including the Department of Natural Resources, the Forest Commission, the Department of Parks, Recreation & Tourism, the Office of Resiliency, and the Department of Health & Environmental Control.
15. Overall, I have approximately 27 years of experience in the sustainability field specific to South Carolina's watersheds, and have been part of successful, collaborative private/public partnership projects in most of the state's major watersheds. I have specific expertise in

¹ Chapter 12, Protecting the Land: Conservation Easements Past, Present, and Future by Gustanski and Squires (2000).

² Elizabeth Brabec and Sharon Richardson, "A Clash of Cultures: The Landscape of the Sea Island Gullah," Landscape Architecture & Regional Planning Faculty Publication Series, University of Massachusetts Amherst (2007).

non-profit management, with experience in land and wetlands acquisition, funding, management, protection and restoration; nature-based solutions; water quality; advocating for and drafting environmental policy; and advocating for public benefit of healthy ecosystems through state and local planning. The opinions contained herein are a reflection of my education, skills, experience, and professional background described above.

16. *It is well-documented that septic systems are a nonpoint source of pollution to surface and groundwater that results when there are land use conversions from farm, field, or forest to high density residential uses. This scientific conclusion is recognized by many coastal jurisdictions in the United States, which have taken action by adopting policies, laws, regulations, and ordinances to reduce and prevent the environmental risks and harms of septic systems as one of the many sources contributing to nutrient loading and nonpoint source pollution. Septic installation doesn't happen unless homes are being built, and septic effluent is a nonpoint source of pollution and stressor to water quality that can be easily avoided. However, South Carolina's existing laws, regulations, standards, and permitting regimes for septic are drastically underperforming, failing to recognize what scientific research concludes. This, combined with lack of monitoring, has resulted in the over-permitting of septic systems that exceed the capacity of coastal soils.*
17. One tool South Carolina does have are the policies found in the State's Coastal Management Program ("CMP"), which provide for heightened consideration of how various projects impact coastal resources, and specifically coastal waters; however, these policies are not being applied or even considered when it comes to applications for septic tank permits.

18. South Carolina's septic system permitting regime is the responsibility of the South Carolina Department of Health & Environmental Control (DHEC). The minimum regulations that exist for septic installation are applied statewide with no accountability for upstream and downstream water quality needs and vulnerabilities; the existing regulations fail to account for critical variables for suitability of septic siting, especially within the coastal counties that have saturated soils and high groundwater tables not suitable for efficient septic system functioning. These geographical characteristics are exacerbated by the "new normal" of extreme weather events, increased frequency and severity of episodic and catastrophic flooding, not to mention the changing threats from unavoidable, unpredictable, and unprecedented weather events. Rising water tables and the shallow topography of the Coastal Plain are also factors that are not being considered, and septic design standards are not staying current with best available information and technology, nor is active monitoring or routine maintenance promoted by DHEC or at the local level.
19. Under the current permitting regime, each local jurisdiction makes independent decisions regarding land development, which are based on factors that vary widely from county to county and town to town. Local leaders are engaging in decision-making without regard for downstream impacts, impacts to public trust waters, and impacts to neighboring jurisdictions. Density decisions are made independent of adjacent municipality needs and comprehensive planning. Without coordination across a watershed, interjurisdictional standards alone will continue to incentivize the lowest standard for development.
20. Further still, in South Carolina, there is a systemic disconnect between federal, state, and local environmental regulations. In our current permitting regime, no agency is considering the cumulative, widespread impacts of this exponential increase in septic

systems, although DHEC has the authority to do so under the CMP. I know from firsthand experience that local jurisdictions are not equipped to consider these cumulative impacts, and local officials lack expertise about state and federal environmental regulations. There is no consistency with regard to nonpoint source pollutants and all sources thereof, including septic system pollution. It is my experience there is not a shared understanding between officials at the local level about the priorities of South Carolina when it comes to minimizing exposure to risks of ecosystem degradation from unintended consequences of septic system failures.

21. This lack of accountability only serves to exacerbate the problems listed above and is a symptom of the trend we are seeing in recent years: an increase in larger residential developments equipped to treat human wastewater with individual septic systems, packed onto land with soils that are inappropriate for septic. Nutrient loading from untreated effluent from ill-sited, aging, underperforming septic tanks leads to adverse impacts on water quality.
22. DHEC has the ability to critically examine permit applications for septic installation within and between local jurisdictions. DHEC could—and should—provide consistency and neutral oversight by applying CMP policies, but is failing to do so. Likewise, DHEC knows about threats to the environment from septic systems; DHEC knows septic effluent is a stressor to water quality; and DHEC has the ability to control and mitigate outcomes of nonpoint source pollutants. By failing to acknowledge and regulate the realities of septic systems, DHEC is not upholding its mission statement or regulatory charge to protect the waters of the State, putting human health and the environment at risk.

23. The CMP provides guidelines that must be considered by DHEC when reviewing permit applications in the coastal zone. DHEC claims it is not required to consider these guidelines for septic tank applications, which has led to serious consequences.
24. The CMP requires that DHEC review “the extent and significance of impact on . . . valuable coastal resources” of unique natural areas, public recreational lands, and historic or archeological resources. DHEC is not conducting this review for septic tanks at the expense of these named coastal resources. For example, the Ashley River, which flows through Dorchester and Charleston counties, was designated a State Scenic River by the state legislature in 1998 and 1999 pursuant to the South Carolina Scenic Rivers Act of 1989. There are also many water-adjacent historic sites, archeological sites, and public recreational lands along the Ashley River, including three National Historic Register properties (Middleton Place, Magnolia Plantation, and Drayton Hall), a State Historic Site (Colonial Dorchester), a state park (Charles Town Landing), and two county parks. Despite all of this, DHEC continues to authorize hundreds of septic tanks on lands for which the Ashley River is a receiving water body.
25. The CMP requires that DHEC review “the extent to which the project will meet existing State and Federal requirements for waste discharges” including “point sources of air and water discharge, and for protection of inland wetlands.” State laws and regulations provide for water quality controls and impose heightened restrictions for water bodies based on their classification. Further, the federal Clean Water Act regulates impacts to waters of the United States, and state law regulates impacts to waters of the State, particularly isolated wetlands. DHEC is not reviewing septic permit applications for compliance with these federal and state requirements. Consider the Ashley River. The water quality in the Ashley

River is “impaired” or already at capacity for point source discharge, meaning that the river cannot absorb any more pollutants. However, because no one is monitoring or measuring septic effluent and the cumulative impacts of other nonpoint source pollutants, the water quality of the Ashley River continues to degrade. Despite this, new residential neighborhoods continue to be designed with septic systems near or along the Ashley River.

26. The CMP requires that DHEC review “the extent and significance of negative impacts on Geographic Areas of Particular Concern (GAPCs).” As previously mentioned, the Ashley River was designated a Scenic River, and Scenic Rivers are automatically considered to qualify as GAPCs. DHEC is aware of this, and DHEC is further aware that in 2003, the South Carolina Department of Natural Resources (DNR) developed a Management Plan for the Ashley Scenic River which specifically calls out “leaking septic systems” as a nonpoint source of pollution that impacts the river. Despite this, because DHEC does not review septic permits for compliance with the CMP, the impacts on the Ashley River and other GAPCs are not considered.
27. The CMP requires that DHEC review “the extent to which the project is in compliance with local zoning and/or comprehensive plans.” By not conducting the CMP review, DHEC is not reviewing septic permit applications against the comprehensive plans of local jurisdictions, zoning amendments, and annexations that are typically made by local government in order to allow developers to construct large residential neighborhoods. The result is that high quantities of septic tanks are installed in contravention of future land use planning and comprehensive planning. The resulting lack of consistency is detrimental to the water quality, as lack of consistency is, in and of itself, a known threat of nonpoint sources of pollution. The recent annexation of “the Barry Tract” from Dorchester County

on the Historic and Scenic Ashley River to the City of North Charleston highlights the disconnect between municipalities. Dorchester County, through an extensive comprehensive planning process, had targeted Barry Tract for low density in order to maintain the character and shared community vision for the Ashley River. When the tract was annexed to North Charleston, there was no mechanism to maintain this community vision, and the City of North Charleston proceeded to zone it at a much higher density that would have been allowed by Dorchester County. DHEC has subsequently approved approximately dozens of septic permits for residential development on Barry Tract, giving an ill-suited development a green light even though such development is contrary to 30 years of partnership planning and implementation under the Ashley River Scenic River Management Plan.

28. The CMP requires that DHEC review “the possible long-range, cumulative effects of the project, when reviewed in the context of other possible development and the general character of the area.” DHEC is not conducting this review for septic tanks, instead looking at each one individually. If a single proposed septic tank meets the statewide minimal, inadequate requirements for septic, it is approved, even if it is one of two hundred systems on a single project site. DHEC is not evaluating the combined impact that hundreds of septic tanks in close proximity will have on functions and values of natural lands, water quality, shellfish harvesting areas, the carrying capacity of the soil, risks to human health, and more.
29. The CMP requires that DHEC review “the extent to which the project will further the policies of the South Carolina General Assembly, which are mandated for the Coastal Council in implementation of its management program” “to promote the economic and

social improvement of the citizens of this State” and “to protect and, where possible, to restore or enhance the resources of the State’s coastal zone for this and succeeding generations.” DHEC is not conducting this review. Instead, DHEC is ignoring existing best management practices for septic installation and turning a blind eye to future impacts. DHEC is blindly permitting environmental stressors (septic tanks) that overload the natural ability of coastal ecosystems to mitigate the impacts of pollution. DHEC is not considering the impacts of septic on social improvement either, because the agency permits, in large numbers, projects that actually put human health at risk. DHEC is not considering the impacts on economic improvement because it permits, in large numbers, septic systems that impact local water-dependent enterprises like tourism, fishing, and shellfish harvesting. DHEC is not considering that fact that septic tanks are a known threat to water quality, thereby failing to “protect” or even maintain the status quo of our State’s coastal resources.

30. To summarize, septic tanks are designed to perform under certain parameters, and those parameters no longer reflect current environmental trends, changing weather patterns, and other realities of the coastal zone. The approval of septic tanks, if reviewed for consistency with the CMP, would afford DHEC a tool to coordinate improved collaboration and long-term watershed planning at the local level; the CMP provides an opportunity for improved decision making that minimizes, avoids, and deters adverse impacts to water quality, including septic installation in floodplain corridors of culturally and historically significant river corridors. Instead, DHEC is complicit in the continued degradation of our sensitive coastal ecosystems, and its failure to conduct coastal zone consistency certification reviews is causing serious, immediate, and irreparable harm.

Further Affiant sayeth not.

Sharon E Richardson
Sharon E. Richardson

SWORN before me this 12 day of April, 2023.

Sherry R Aikens

Notary Public for Pennsylvania

My Commission Expires: July 28, 2024

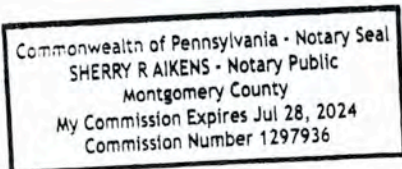


EXHIBIT I

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	
COUNTY OF CHARLESTON	)	NINTH JUDICIAL CIRCUIT
	)	
South Carolina Coastal Conservation League and Charleston Waterkeeper,	)	
	)	Case No. 2022-CP-10-05192
Plaintiffs,	)	
	)	
vs.	)	AFFIDAVIT OF
	)	ANDREW WUNDERLEY
South Carolina Department of Health and Environmental Control,	)	
	)	
Defendant.	)	
	)	

PERSONALLY APPEARED BEFORE ME, Andrew Wunderley, who being duly sworn, states as follows:

1. My name is Andrew Wunderley. I am over the age of eighteen (18) and suffer from no legal incapacity.
2. I currently reside in Charleston County on James Island, South Carolina.
3. I am the Executive Director of Charleston Waterkeeper (“Waterkeeper”). Waterkeeper is a 501(c)(3) nonprofit organization founded in 2009 and incorporated by the State of South Carolina for the purpose of protecting and restoring Charleston’s waterways. Waterkeeper’s environmental stewardship work includes water quality testing of Charleston County waterbodies, habitat restoration, pollution reporting, community outreach and engagement, and environmental advocacy and education. I started working at Waterkeeper in 2011 and have been Executive Director since 2015.
4. I earned a Bachelor’s Degree in Biology from the College of Wooster in 1997, a Master of Science in Environmental Policy from the Graduate School at the College of Charleston in 2005, and a Juris Doctor from the Charleston School of Law in 2008.
5. In addition to my work at Waterkeeper, I currently serve as a committee member on both the

James Island Creek Water Quality Task Force and the City of Charleston's Army Corps of Engineers 3x3 Flood Protection Study Citizen and Business Advisory Committee, also known as the Army Corps 3x3 Advisory Committee.

6. I have testified before various South Carolina House of Representatives committees and subcommittees, as well as local city and town councils and committees in Charleston, Mount Pleasant, James Island, Awendaw, and others, on topics such as water pollution, water quality, and bacteria pollution.
7. As Executive Director of Waterkeeper, my regular duties include leadership of the organization, management of Waterkeeper staff and board of directors, advancement of advocacy and programmatic goals, responding to pollution reports, facilitating and coordinating water sampling collections, and community outreach. As part of my job, I also routinely read and rely on scientific literature on water quality topics, including peer-reviewed articles, scientific research and studies, and water quality reports.
8. One of Waterkeeper's primary functions is monitoring the water quality of Charleston's waterways. Waterkeeper's staff and trained volunteers regularly collect water samples from approximately forty (40) locations around the County. These water samples are then tested for various parameters; Waterkeeper routinely publishes the results on our website, www.charlestonwaterkeeper.org, to inform the public.
9. Waterkeeper's sampling methods and protocols are identical to those used by the South Carolina Department of Health and Environmental Control ("DHEC"). Waterkeeper's Quality Assurance Project Plan has been approved by DHEC's Quality Assurance Department every year since 2013, meaning that Waterkeeper upholds appropriate quality controls that DHEC can rely on in agency decision-making. In fact, DHEC often relies on and incorporates Waterkeeper's sampling data in making administrative decisions and

issuing reports, such as DHEC's Integrated Report for Clean Water Act Section 303(d) List (2018), DHEC's Total Maximum Daily Load (TMDL) Report for James Island Creek (2019), and DHEC's Total Maximum Daily Load (TMDL) Report for Shem Creek (2019). The TMDL reports specifically rely on Waterkeeper's sampling data to determine whether or not James Island Creek and Shem Creek are maintaining water quality standards and are further relied on by DHEC to develop and issue TMDLs for these waterbodies.

10. Waterkeeper regularly operates two distinct water quality testing programs referred to as "Creek Watcher" and "Swim Alert." Through the Creek Watcher program, water samples are collected from approximately forty (40) locations; these samples provide data on temperature, salinity, dissolved oxygen, pH, and clarity. Creek Watcher samples are collected and analyzed once a month. The Swim Alert program, on the other hand, is meant to advise the public regarding the safety of swimming in Charleston's waterways, and is thus limited to peak times of year for outdoor recreation. During the months of May through October, Swim Alert samples are collected weekly from approximately twenty (20) locations, the majority of which are public access points where people are most likely to be accessing the water. These samples are then analyzed by Waterkeeper staff at the College of Charleston's Department of Geology and Environmental Geoscience Hydrochemistry Research Laboratory to examine bacteria levels, specifically the enterococcus bacteria, to determine whether or not the water is safe for swimming.
11. Enterococci are fecal coliform bacteria that indicate contamination of marine and brackish water by fecal matter, including human fecal waste, and therefore also indicate the presence of other disease-causing bacteria and viruses. These pathogens can make humans sick when exposed through water-based recreation. Waters that exceed 104 CFU/100 mL (104 colony-forming units per 100 milliliters), South Carolina's water quality standard (WQS) for

primary contact recreational use in tidal saltwater, are not considered safe for swimming.

12. Malfunctioning septic systems are widely recognized to be a source of contamination in water bodies. During my time with Waterkeeper, I have observed a strong relationship between upland areas serviced by densely-clustered septic systems and degraded water quality of nearby creeks; specifically, I have documented higher bacteria levels in waterways that are close to known, clustered septic systems.
13. Two Charleston waterways are particularly illustrative of the connection between water quality and proximity to septic systems: James Island Creek and Shem Creek. Both creeks are sampled as part of Waterkeeper's Swim Alert program, and both routinely trigger swim alerts due to levels of enterococcus that exceed state Water Quality Standards.
14. Waterkeeper samples James Island Creek at two locations. During 2022, water from sampling site "James Island Creek 2", located upstream from Folly Road and the Charleston Harbor, exceeded state WQS for enterococcus 20 out of 25 times. The water in Shem Creek is sampled by Waterkeeper at 3 locations. During the summer sampling period in 2022, water from "Shem Creek 3", located on the northeast end of Shem Creek upstream from Coleman Boulevard and the Harbor, also exceeded state WQS for enterococcus 20 out of 25 times. *See Attachment A.*
15. Even though sewer service is now available in the areas around James Island Creek and Shem Creek, many individual residences nearby are still serviced by septic. It is estimated that as many as 60-70 septic tanks are installed along Shem Creek, and hundreds more near James Island Creek. The James Island Creek Watershed Plan (2021) identifies septic systems as a likely source of enterococci in water samples, and that the potential of untreated sewage entering the waterbodies of this watershed from septic systems is high. *See Attachment B.* That watershed study estimated that at least 346 septic systems exist in the watershed with

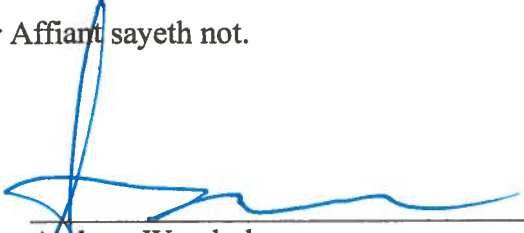
many being adjacent to or in close proximity to a water body. Further, James Island Creek is a receiving water body for the Julian Clarke neighborhood, where many small lots (some as small as half an acre) are serviced by an estimated 181 individual septic tanks. This study also ruled out homeless encampments a possible source of human waste.

16. In contrast, creeks that lie in close proximity to neighborhoods which are serviced by more modern sewer infrastructure are much cleaner. For example, Hobcaw Creek, a receiving waterbody for the Hobcaw Point neighborhood (serviced by sewer) only exceeded enterococcus WQS in 4 of 50 samples taken during 2022. *See Attachment A.*
17. In addition to our regular water sampling programs, Waterkeeper occasionally partners with other organizations and participates in research projects and special studies.
18. One such study, conducted by Waterkeeper and Charleston Water System in 2021, was a “microbial source tracking” project. The goal of this study was to identify the source of fecal bacteria (human, bird, or dog) found in our waterways. Waterkeeper collected water samples from three locations along James Island Creek and Simpson Creek and sent those samples to a private accredited laboratory (Source Molecular) for DNA analysis. The results showed that for “wet weather sample events,” i.e., samples taken after rainfall, bird DNA was detected and quantified at all sites; dog DNA was detected but at such low levels it could not be quantified. Importantly, human DNA was found to be the primary source of fecal bacteria, and was detected and quantified at all sites. Samples taken during dry weather conditions detected and quantified human DNA at one site. At all other sites, dog and bird DNA was not detected, or was detected at such low levels they could not be quantified. The difference in the dry and wet sampling results is expected, given the main pathway for septic pollution to enter waterbodies is through flood waters or stormwater runoff. These results show that

human waste is entering the environment from sources like septic tanks or sewer overflows; however, there were no reported sewer overflows in either creek at the time of sampling.

19. The data and studies demonstrate a strong correlation between levels of enterococcus that exceed state water quality standards and the presence of septic systems. Based on my expertise and experience, that correlation exists because septic systems, particularly when unmaintained and in areas adjacent to coastal waters, lead to contamination and pollution of these coastal waters.
20. For these reasons, the Waterkeeper seeks to prevent further pollution of our water bodies by ensuring that DHEC undertakes a coastal zone consistency certification review to determine whether and where septic systems should be installed and to impose any conditions on septic tank permits that may be necessary to protect our waterways from further bacterial contamination.

Further Affiant sayeth not.


Andrew Wunderley

SWORN before me this 6th day of April, 2023.


Notary Public for South Carolina

My Commission Expires:

7/18/2026

ATTACHMENT A

AFFIDAVIT OF
ANDREW WUNDERLEY

Charleston Waterkeeper Swim Alert Data (2022): Results in red exceed the state water quality standard (104 cfu/100 mL).

Sample Site Location	10/26/2022	10/19/2022	10/12/2022	10/5/2022	9/21/2022	9/14/2022	9/7/2022	8/31/2022	8/24/2022	8/17/2022	8/10/2022	8/3/2022	7/27/2022	7/20/2022	7/13/2022	7/6/2022	6/29/2022	6/22/2022	6/15/2022	6/8/2022	6/1/2022	5/25/2022	5/18/2022	5/11/2022	5/4/2022
Ashley River 1	<10	443	31	52	10	20	30	146	108	10	51	20	30	41	41	10	<10	10	<10	10	10	31	<10	<10	10
Ashley River 2 (Brittlebank Park)	10	982	52	144	768	120	52	395	609	505	108	646	97	253	41	20	250	41	10	20	51	52	52	75	20
Ashley River 3 (Northbridge Park)	74	96	74	281	63	108	132	1198	256	173	41	108	92	259	86	63	63	52	10	20	31	20	75	20	20
Cove Creek 1	20	30	10	86	<10	<10	30	10	74	<10	63	<10	20	52	31	30	<10	10	<10	20	<10	10	10	132	<10
Charleston Harbor 1 (Demetre Park)	<10	333	52	171	30	20	10	160	20	<10	30	20	74	144	20	<10	30	10	<10	<10	10	86	<10	110	<10
Charleston Harbor 2 (CofC Sailing)	<10	---	<10	31	10	30	20	30	20	10	10	226	20	41	10	10	<10	<10	<10	10	<10	10	<10	---	<10
Charleston Harbor 3 (Battery Beach)	<10	9606	<10	10	10	<10	51	<10	<10	<10	52	51	62	41	20	10	10	20	10	<10	<10	20	<10	20	<10
Clark Sound 1	10	<10	<10	31	31	30	10	10	20	10	41	10	20	30	30	31	30	10	10	10	<10	<10	10	20	20
Folly River 1 (FB Boat Landing)	20	10	<10	52	40	10	114	30	40	10	41	10	20	75	41	31	10	<10	20	20	<10	10	10	<10	<10
Filbin Creek 1	257	> 24196	3026	1829	14136	1019	1664	1153	2481	663	895	6131	8164	9208	1918	1565	> 24196	4245	390	1522	8704	505	668	155	152
Hobcaw Creek 1	20	---	20	41	41	20	20	52	30	30	86	845	41	<10	63	<10	10	10	<10	31	10	10	10	---	<10
Hobcaw Creek 2	<10	74	20	63	41	10	52	61	41	52	156	30	121	63	226	30	20	10	10	10	<10	74	30	63	<10
James Island Creek 1	30	---	51	327	160	85	131	350	84	97	169	73	63	41	52	41	<10	109	20	31	74	110	51	---	63
James Island Creek 2	145	148	265	193	298	122	298	708	279	119	275	86	318	148	323	288	146	185	85	512	41	246	41	86	161
Shem Creek 1 (Shem Creek Park)	10	20	10	134	52	10	135	20	108	<10	20	20	20	201	74	20	195	31	<10	74	20	41	20	52	20
Shem Creek 2 (Boat Landing)	<10	52	20	158	63	30	72	31	292	10	85	10	86	145	158	169	618	<10	31	10	20	52	10	97	20
Shem Creek 3	84	122	132	988	633	131	1553	135	1234	243	422	86	934	476	291	211	14136	473	41	171	85	323	135	226	97
Stono River (Sol Legare PBL)	<10	<10	<10	52	20	41	41	211	30	30	30	<10	20	20	20	10	20	30	<10	10	10	10	31	10	10
Wappoo Cut 1	31	52	52	119	74	148	109	226	74	73	41	30	41	108	20	63	10	20	20	<10	20	84	10	20	30
Wando River (DI Children's Park)	40	20	20	31	10	20	41	10	10	10	20	30	30	10	30	<10	<10	10	10	10	<10	<10	<10	20	<10

EXHIBIT J



June 3, 2024

Leslie M. Lenhardt, Esquire
Amy E. Armstrong, Esquire
South Carolina Environmental Law Project
P.O. Box 1380
Pawleys Island, SC 29585

RE: Coastal Conservation League & Charleston Waterkeeper v. SCDHEC
C/A No.: 2022-CP-10-05192

Dear Counsel:

Attached please find for service upon you DHEC's Responses to Plaintiffs' Requests for Admissions in the above-referenced matter.

Sincerely,

Bradley D. Churdar
Associate General Counsel

BDC/jhd

Enclosures

STATE OF SOUTH CAROLINA
COUNTY OF CHARLESTON

IN THE COURT OF COMMON PLEAS
NINTH JUDICIAL CIRCUIT

South Carolina Coastal Conservation
League and Charleston Waterkeeper,

Case No. 2022-CP-10-05192

Plaintiffs,

v.

DHEC'S RESPONSE TO PLAINTIFFS'
REQUESTS FOR ADMISSION

South Carolina Department of Health and
Environmental Control,

Defendant.

TO: LESLIE LENHARDT, ATTORNEY FOR THE PLAINTIFFS

Pursuant to Rule 21 and Rule 36 of the South Carolina Rules of Civil Procedure, Respondent South Carolina Department of Health and Environmental Control ("DHEC" or "the Department"), by and through its undersigned attorneys, hereby responds to Plaintiffs' Requests for Admissions as set forth below.

1. Admit that DHEC does not review individual septic tank permit applications, those that generate less than 1,500 gallons per day of domestic wastewater, for consistency with the policies of the Coastal Management Program.

RESPONSE: DHEC admits only that it is not required to review individual septic applications that generate less than 1,500 gallons per day of domestic wastewater for consistency with the current Coastal Management Program. DHEC denies the remainder of Request to Admit No. 1.

2. Admit that the Coastal Management Program policies relating to septic tanks have not been updated since the policies were approved by the General Assembly in 1979.

RESPONSE: Admit.

3. Admit that DHEC estimates that between ten and thirty percent of septic systems fail to function properly in an average year.

RESPONSE: Denied. While a percentage of installed septic systems may malfunction, DHEC has not estimated that percentage and has only investigated known malfunctions on a case-by-case basis in accordance with Regulation 61-56.

4. Admit DHEC does not place on public notice of any kind individual septic tank permit applications of less than 1,500 gpd.

RESPONSE: Admit.

5. Admit that DHEC is the state agency charged with processing permit applications to construct and operate onsite wastewater systems generating less than 1,500 gallons of domestic wastewater per day.

RESPONSE: Admit.

6. Admit that a permit to construct and operate any new, upgraded, or expanded onsite wastewater system must be obtained from DHEC prior to construction and operation of the system.

RESPONSE: Admit.

7. Admit that a permit to construct an onsite wastewater system is a state-issued permit.

RESPONSE: Admit.

8. Admit that DHEC was required by state law to develop a system that allowed it to review all state and federal permit applications in the coastal zone and to certify that such applications do not contravene the coastal management plan.

RESPONSE: DHEC admits that the Department is authorized by state law to develop a system whereby OCRM shall have the authority to review all state and federal permit applications in the coastal zone, and to certify that these do not contravene the management plan. The Department has in fact satisfactorily developed a comprehensive coastal management program through its promulgation of the Coastal Management Program. The Department considered the environmental consequences and elected not to require a CZC

Certification for all septic tank permits and “small” onsite wastewater systems, but rather only for those that exceed 1500 gallons per day. DHEC denies the remainder of Request to Admit No. 8.

s/Bradley D. Churdar

Bradley D. Churdar, SC Bar # 12829
South Carolina Department of Health and
Environmental Control
1362 McMillan Avenue, Suite 400
Charleston, SC 29405
(843) 953-0213
churdabd@dhec.sc.gov

Sara V. Martinez, SC Bar #74822
South Carolina Department of Health and
Environmental Control
2600 Bull St.
Columbia, SC 29201
(803) 898-0288
martinsv@dhec.sc.gov

June 3, 2024

Charleston, South Carolina

STATE OF SOUTH CAROLINA

COUNTY OF CHARLESTON

South Carolina Coastal Conservation
League and Charleston Waterkeeper,

Plaintiffs,

v.

South Carolina Department of Health and
Environmental Control,

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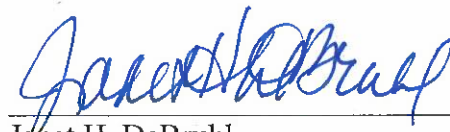
IN THE COURT OF COMMON PLEAS
NINTH JUDICIAL CIRCUIT

Case No. 2022-CP-10-05192

CERTIFICATE OF SERVICE

I, Janet H. DeBruhl, Paralegal with the South Carolina Department of Health and Environmental Control, hereby certify that I have this date served the foregoing *DHEC's Response to Plaintiffs' Requests for Admissions* upon all counsel of record by U.S. Mail and electronically by sending to the addresses indicated below:

Amy E. Armstrong, Esquire (amy@scelp.org)
Leslie S. Lenhardt, Esquire (leslie@scelp.org)
S.C. Environmental Law Project
P.O. Box 1380
Pawleys Island, SC 29585



Janet H. DeBruhl

June 3, 2024

Charleston, South Carolina

EXHIBIT K

RE: FOI request, septic tank applications, Charleston County

From: Martinez, Sara <martinsv@dhec.sc.gov>
To: leslie@scelp.org <leslie@scelp.org>, Information, Freedom <foi@dhec.sc.gov>
Cc: [Emily Nellermoe](mailto:emily@scelp.org) <emily@scelp.org>, [Brand, Kelsey L.](mailto:brandkl@dhec.sc.gov) <brandkl@dhec.sc.gov>
Subject: RE: FOI request, septic tank applications, Charleston County
Date: Monday, September 12, 2022 5:38 PM
Size: 51 KB

Hi Leslie. The FOIA department will pull any septic tank applications/permits (BEHS) and stormwater applications/permits (BOW). Do you want to also have them check with OCRM for any CZCs or Critical Area Permits? Are there any other types of permits you are interested in so we can make sure we are checking for them? With all the different types of permits falling in many different programs within the agency, it is onerous and likely unreliable for us to confirm for you we have identified "any" permits for a site rather than searching for any specifically listed types of permits. We certainly want to check all the program areas for any type of permit you may be interested in us searching.

We also need to know the specific permit applications you want notice of in order to track your request for written notice of a permitting decision. For notices related to any future applications or permits, please resubmit your request at such time as the applications or permit exist so that the Department will be able to track your request with the specific application or permit. You can monitor for permit applications that are placed on public notice via the Department's website here: <https://scdhec.gov/permits-regulations/public-notices>. For all other permit applications, you may continue to inquire with the Department's FOIA office.

Let me know if you have any questions. And don't hesitate to follow-up with me on the status of your FOIA request to ensure it gets processed expediently. Would it be helpful I were able to let you know, even while the full FOIA response is still being pulled together, once the program staff have responded whether any pending permit applications exist?

Sara V. Martinez

Chief Counsel for Environmental Affairs

S.C. Dept. of Health & Environmental Control

2600 Bull Street

Columbia, SC 29201

office: (803) 898-0288

cell: (803) 465-2822

connect: www.scdhec.gov



From: Leslie Lenhardt <leslie@scelp.org>

Sent: Monday, September 12, 2022 4:16 PM

To: Information, Freedom <foi@dhec.sc.gov>

Cc: Martinez, Sara <martinsv@dhec.sc.gov>; Emily Nellermoe <emily@scelp.org>; Brand, Kelsey L. <brandkl@dhec.sc.gov>

Subject: Re: FOI request, septic tank applications, Charleston County

*** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. ***

Many thanks!

--

Leslie Lenhardt

Staff Attorney

S.C. Environmental Law Project

510 Live Oak Drive

Mount Pleasant, SC 29464

Phone: (843) 527-0078

leslie@scelp.org

On Mon, Sep 12, 2022, at 4:14 PM, Information, Freedom wrote:

Good afternoon,

I hope you are well! We have received your request through our FOI email, and it has been assigned FOI request number **868106**. It is currently pending assignment to a coordinator for further processing.

Kindest Regards,

Freedom of Information

S.C. Dept. of Health & Environmental Control

Office: (803)898-3882

Connect: www.scdhec.gov [Facebook](#) [Twitter](#)



From: Leslie Lenhardt <leslie@scelp.org>

Sent: Monday, September 12, 2022 12:54 PM

To: Information, Freedom <foi@dhec.sc.gov>

Cc: Martinez, Sara <martinsv@dhec.sc.gov>; Emily Nellerhoe <emily@scelp.org>; Brand, Kelsey L. <brandkl@dhec.sc.gov>

Subject: FOI request, septic tank applications, Charleston County

*** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. ***

Good afternoon,

I am submitting this request pursuant to the SC Freedom of Information Act for parcels located in the Town of Awendaw in Charleston County. We are seeking any and all DHEC applications and/or permits, including but not limited to septic tank applications/permits and stormwater applications/permits. I am attaching documents that identify the properties with the TMS numbers: 6810000028 (Please note that I requested notification for any permits for this tract pursuant to S.C. Code Ann. Section 44-1-60, letter attached)

6440000023

6440000026

6440000030

I am also requesting notification pursuant to S.C. Code Ann. Section 44-1-60 for the remaining three properties for any permitting decisions forthcoming.

Please let me know if you require any other information from me. Thank you!

Leslie

--

Leslie Lenhardt

Staff Attorney

S.C. Environmental Law Project

510 Live Oak Drive

Mount Pleasant, SC 29464

Phone: (843) 527-0078

leslie@scelp.org

Deposition of:

Chris Stout

SCCCL and Charleston Waterkeeper

v.

SCDHEC

Case #: 2022-CP-10-05192

November 7, 2024



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STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS
COUNTY OF CHARLESTON) NINTH JUDICIAL CIRCUIT

South Carolina Coastal Conservation)
League and Charleston Waterkeeper,)

Plaintiffs,)

v.)

Case No.:
2022-CP-10-05192

South Carolina Department of Health)
and Environmental Control,)

Defendant.)

DEPOSITION OF: CHRIS STOUT

DATE TAKEN: Thursday, November 7, 2024

TIME: 11:00 A.M.

PLACE: SCDES-OGC
2600 Bull Street
Columbia, South Carolina

REPORTED BY: MARY ANN RIDENOUR, RPR, CLR, CVR-S
and Notary Public

MAGNOLIA REPORTING, LLC (843) 303-9141
www.MagnoliaReporting.com

ROA 801

Page 2

1 A P P E A R A N C E S

2
3 REPRESENTING THE PLAINTIFFS:

4 LESLIE S. LENHARDT, ESQUIRE
5 SC Environmental Law Project
6 510 Live Oak Drive
7 Mount Pleasant, South Carolina 29464
8 (843) 527-0078
9 leslie@scelp.org

10 MONICA K. WHALEN, ESQUIRE
11 SC Environmental Law Project
12 PO Box 1380
13 Pawleys Island, South Carolina 29585
14 (843) 527-0078
15 monica@scelp.org

16 REPRESENTING THE DEFENDANT:

17 SARA V. MARTINEZ, ESQUIRE
18 SCDES-OGC
19 2600 Bull Street
20 Columbia, South Carolina 29201
21 sara.martinez@des.sc.gov

22 ALSO PRESENT:

23 DAVID VAUGHAN
24
25

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I N D E X

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STIPULATIONS

It is hereby stipulated and agreed by and between
the parties hereto, through their respective counsel,
that the reading and signing of the transcript is
waived by the Deponent.

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1 (The deposition commenced at 11:14 a.m.)

2 CHRIS STOUT, SWORN.

3 DIRECT EXAMINATION BY MS. LENHARDT:

4 Q. May I call you Chris?

5 A. Sure.

6 Q. Chris, Leslie Lendhardt. And I'm
7 representing the Charleston Waterkeeper and the Coastal
8 Conservation League in a circuit court case. And you
9 understand that's the case that brings us here today --

10 A. I do.

11 Q. -- correct? Okay.

12 I'm pretty sure you've given a deposition
13 before; is that right?

14 A. I have.

15 Q. Okay. Well, the rules require me to give you
16 a couple of, sort of, ground rules. If -- if I do not
17 make sense in my question, which likely will happen at
18 some point, ask me to clarify, please, and not your
19 attorney.

20 A. Uh-huh.

21 Q. And I know you probably also know to
22 verbalize your answers instead of saying "uh-huh" and
23 "uh-uh" --

24 A. Yes.

25 Q. -- so that the court reporter can -- can

1 understand and take it down. And then, we'll try not
2 to talk over one another for that very reason also.
3 Let's see. And if you answer my question, I'm going to
4 assume that you understood it and you are affirmatively
5 answering one way or the other; is that --

6 A. Understood.

7 Q. Okay. All right. Now, I'm going to mark
8 Exhibit No. 1 for your deposition.

9 (Plaintiff's Exhibit No. 1 marked for
10 identification.)

11 BY MS. LENHARDT:

12 Q. Chris, this has been marked as Exhibit 1 to
13 your deposition. Do you recognize this document?

14 A. I do, yes.

15 Q. Okay. And this is the 30(b)(6) notice that
16 the plaintiffs served on DHEC; is that right?

17 A. Correct.

18 Q. Okay. And have you reviewed this notice?

19 A. I have.

20 Q. All right. And your counsel informed me that
21 you will be testifying about certain of the areas of
22 inquiry. And is it my -- am I correct that you will
23 testify to Number 1, Number 5, Number 6, and Number 7?

24 A. Yes.

25 Q. Okay. And I probably ought to go -- I

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1 probably ought to just get one by one for the record.

2 So Number 1 states, The review and
3 approval/denial procedures for Coastal Zone Consistency
4 Certifications for state permit applications, as well
5 as the procedures for issuing general CZCCs.

6 And you're prepared to answer questions about
7 that?

8 A. I am.

9 Q. And Number 5 is, Any Coastal Zone Consistency
10 Certification review of an application for septic tank
11 permits generating less than 1,500 gallons per day
12 conducted within the past ten years.

13 Are you prepared to answer questions about
14 that?

15 A. I am.

16 Q. Okay. Number 6, The department's policies
17 and practices related to review of applications for
18 septic tank permits, generally -- generating less than
19 1,500 gpd for consistency with the policies of the
20 Coastal Management Program.

21 Are you prepared to answer questions about
22 that?

23 A. I am.

24 Q. And Number 7 is, DHEC's internal review
25 process for septic tank permits that also receive

1 coastal zone consistency certification.

2 Are you prepared to answer questions about
3 that?

4 A. I am.

5 Q. Okay. And then, on the last page, there is a
6 Notice To Produce as part of the 30(b)(6) notice. Did
7 you bring any documents here today that we don't
8 already have?

9 A. I did not.

10 Q. Okay. All right. And so, are you answering
11 questions today as the designated representative for
12 DES?

13 A. For the coastal zone consistency, yes.

14 Q. For -- for the items identified in the
15 notice?

16 A. That's correct.

17 Q. And I am, more than likely, going to mix up
18 DES and DHEC. But when I refer to either one, can we
19 agree that we're talking about the same agency?

20 A. Yes.

21 Q. Okay. All right, great.

22 What did you do to prepare for this
23 deposition today?

24 A. I reviewed the notice of deposition, reviewed
25 policies within the Coastal Zone Management Program

Page 8

1 document, looked at some of our past permit records,
2 and met with counsel.

3 Q. Okay. And are there any documents, to your
4 knowledge, that you reviewed, that weren't produced as
5 part of this case?

6 A. No.

7 Q. Okay. And so, when people look -- read this
8 deposition years from now, let's put on the record that
9 there has recently been a statutory splitting of the
10 Department of Health and Environmental Control; is that
11 correct?

12 A. That is correct.

13 Q. Okay. And now it's called the Department of
14 Environmental Services?

15 A. Correct.

16 Q. If you could, talk about your employment
17 history with DES.

18 A. Okay. I started with the department a little
19 over 16 years ago. I was in our wetland critical area
20 permitting section at that time. I was a project
21 manager and team lead within that section for
22 approximately ten years. After that, I became the
23 section manager for the coastal zone consistency
24 section and -- for a little over five years in that
25 role. And then, I am currently bureau chief for the

1 Bureau of Coastal Management with DES since March of
2 this year.

3 Q. March of 2024?

4 A. That's correct.

5 Q. What are you -- what are y'all referring
6 to -- it's not OCRM anymore. It's --

7 A. It's BCM, yeah.

8 Q. BCM?

9 A. Bureau of Coastal Management.

10 Q. Okay. All right. And then, tell me again
11 how long you were in the certification section before
12 you became the head.

13 A. A little over five and a half years.

14 Q. Okay. Tell me, please, what were your duties
15 and responsibilities as the head of the certification
16 section?

17 A. So I was in charge of the staff within the
18 coastal zone consistency section, ensuring that we were
19 properly processing requests both for federal and state
20 consistency reviews, assisting with the establishment
21 of general coastal zone consistency, hiring of staff,
22 attending meetings.

23 Q. And have you -- did you -- at -- in your
24 role, did you conduct CZ cert reviews yourself or were
25 you mainly a supervisor of others?

Page 10

1 A. Both. I supervised others and conducted
2 reviews.

3 Q. Okay. And how many employees were you
4 supervising when you were in the CZ section?

5 A. Let me think. At the end of my time as
6 section manager, there were five staff within the CZC
7 section.

8 Q. And those five staff would be the people who
9 would do the reviews?

10 A. That's correct, yes.

11 MS. MARTINEZ: Object to the form of the
12 question.

13 BY MS. LENHARDT:

14 Q. All right. The coastal zone section is part
15 of what used to be called OCRM. Are -- is there any
16 other section of BCM that conducts coastal zone
17 consistency reviews?

18 A. So, the coastal zone consistency review is
19 also done as part of our direct permit authority that
20 is handled by either our critical area permitting
21 section or our beachfront management section as they
22 are evaluating applications for a direct permit through
23 the Bureau of Coastal Management.

24 Q. Okay. So if -- so when there is a critical
25 area permit applied for, for example, there is a person

1 at OCRM who conducts that review, correct?

2 A. Correct.

3 Q. And is it my understanding that that person
4 also reviews and does the certification review, as
5 well?

6 A. That is correct.

7 MS. MARTINEZ: Object to the form of the
8 question.

9 BY MS. LENHARDT:

10 Q. Okay. So, if you could just explain again,
11 what types of permits are the CZ staff responsible for
12 reviewing?

13 A. Sure. So the coastal zone consistency staff
14 primarily are looking at land disturbance
15 applications -- those are about 80 percent of the
16 workload that come in -- state mining permits, air,
17 miner [sic], and construction permits. They are
18 evaluating for Army Corps of Engineer permits, both
19 individual and nationwide permits, certification of
20 direct federal agency activities, federal funding
21 assistance, wastewater and water supply permits,
22 landfill applications.

23 Q. Okay. Is there -- is there any other
24 subdivision of DES that conducts CZ cert reviews, other
25 than BDM [sic]?

Page 12

1 A. No, just within BCN.

2 Q. Sorry. I might as well just say "OCRM" for
3 clarity's sake. Okay.

4 And explain, what is a Coastal Zone
5 Consistency Certification?

6 A. So the Coastal Zone Consistency Certification
7 is a policy-based review evaluating a project request
8 for certain state permits or federal permits or federal
9 agency activities. That policy review looks at
10 project-specific policies, as well as coastal resource
11 policies, in determining consistency of that request
12 with those applicable policies.

13 Q. Okay. And where are those policies found?

14 A. Those are within the Coastal Zone Management
15 Program document.

16 Q. Okay. Let's mark Exhibit 2.

17 (Plaintiff's Exhibit No. 2 marked for
18 identification.)

19 BY MS. LENHARDT:

20 Q. Here's copy of that. Can you tell me, do you
21 recognize the -- a copy of this? This is Plaintiff's
22 Exhibit No. 2.

23 A. Yes, I do.

24 Q. And what is that?

25 A. That is the landing page for the Coastal Zone

1 Consistency Certification on the DES website.

2 Q. When was that web page developed?

3 A. I don't know the exact date. This was --
4 obviously, it was redone to capture the -- the change
5 from DHEC to DES. But, prior to that, it was part of
6 the DHEC web page for several years.

7 Q. Do you know if the language on the web page
8 has changed significantly since DES came into
9 existence?

10 A. I don't believe we made significant changes.
11 We've been making updates, but I don't think anything
12 significant has changed to date, no.

13 Q. Okay. And did you have any input in drafting
14 this language?

15 A. I did.

16 Q. And is there any reason why you today
17 disagree with any of the descriptions of the
18 consistency certification process?

19 MS. MARTINEZ: Since this wasn't produced in
20 advance, if you'll give him a minute to review it.

21 MS. LENHARDT: Absolutely.

22 BY MS. LENHARDT:

23 Q. Take the time you need.

24 A. Can you ask the question again?

25 Q. Do you -- and when I ask -- say "you", I'm

Page 14

1 going to refer to you as the representative for DES.
2 Do you today have any reason to disagree with any of
3 the language that's on the website?

4 MS. MARTINEZ: Object to the form of the
5 question.

6 BY MS. LENHARDT:

7 A. No.

8 Q. Is the information contained on that website
9 accurate?

10 MS. MARTINEZ: Object to the form of the
11 question.

12 BY MS. LENHARDT:

13 A. Yes.

14 Q. Okay. I would like to talk about some
15 questions relating to area number one of the 30(b)(6)
16 deposition [sic].

17 How does a state or federal application get
18 assigned to one of your staff?

19 A. Those are assigned based on project area,
20 which is divided, right now, by county level. So
21 projects within a particular county are assigned to a
22 certain staff person.

23 Q. And who -- who identifies that an application
24 requires a CZ cert?

25 A. It's --

1 MS. MARTINEZ: Object to the form of the
2 question.

3 BY MS. LENHARDT:

4 Q. Let me ask it -- let me ask it another way.
5 When the agency receives an application for a
6 permit --

7 A. Uh-huh.

8 Q. -- for an activity that is within the eight
9 coastal counties, who at the agency makes a conclusion
10 that that application requires a CZ cert?

11 A. So there are staff either -- within the
12 permitting program of the agency who understand it's in
13 a coastal county and, likely, will require a CZC cert,
14 or it's being submitted directly to coastal zone
15 consistency staff. And those are being evaluated based
16 on the -- the list of permit programs that get a CZC
17 cert to ensure that we're evaluating the correct ones.

18 Q. So are the BCM staff trained in recognizing
19 whether or not a CZ cert is required?

20 A. Yes.

21 Q. And if -- explain to me, please, what the
22 process is for review under the coastal management --
23 under the coastal management policies.

24 A. Sure. So the application is received. It's
25 evaluated for having the necessary information

Page 16

1 administratively. So, do we have the corresponding
2 state or federal action to understand what is being
3 certified? Do we have information about the project to
4 understand exactly how the policies would apply? That
5 application, once that's administratively complete, is
6 put out on a public notice by either the CZC section,
7 if the permitting program does not have their own
8 public notice requirement. It's assigned to staff for
9 a technical review. And then it's evaluated based on,
10 as I mentioned before, the appropriate project-specific
11 policies and the appropriate resource-specific
12 policies. And then, a determination is made from
13 there.

14 Q. Okay. Are all certifications -- proposed
15 certifications -- placed on public notice?

16 A. There is a requirement for the coastal zone
17 consistencies to be placed on public notice. And --
18 and there's language in the Coastal Zone Management
19 Program document that speaks to doing a joint notice
20 with a permitting program, if that permitting program
21 has their own public notice process.

22 Q. Okay. So if there is an independent public
23 notice process, is -- the CZ cert would be noticed as a
24 part of that notice?

25 A. It should be, yes. So, ideally, thinking of,

1 like, the joint public notice with the Army Corps of
2 Engineers, that's a federal, individual permit that
3 triggers a coastal zone consistency review. That
4 public notice calls out that it is for the federal
5 permit, as well as the state certification that goes
6 along with that.

7 Q. Okay. And what about in the instance where
8 there is not an independent public notice requirement?

9 A. Then the CZC section is responsible for
10 putting that public notice out.

11 Q. Okay. And is that public notice process --
12 is that -- does that consist of placing it on DES's
13 website?

14 A. Yes.

15 Q. Is there any direct notice that is provided
16 to any members of the public?

17 A. Not for the coastal zone consistency reviews,
18 no.

19 Q. Okay. So, for example, adjacent
20 properties -- adjacent property owners are not directly
21 notified?

22 A. Not for the Coastal Zone Consistency --

23 Q. Okay.

24 A. -- Certifications.

25 Q. Okay. And what is the difference between an

Page 18

1 individual Coastal Zone Consistency Certification and a
2 general CZ cert?

3 A. It's very much akin to an individual permit
4 in other programs and then their general permit. So
5 the individual coastal zone consistency review is --
6 the project is reviewed based upon its own merits
7 against the policies that would be applicable within
8 the Coastal Zone Management Program document. A
9 general coastal zone consistency is established to
10 provide a streamlined review process where that general
11 coastal zone consistency already has conditions and
12 things that are applied to that project and the overall
13 coastal zone consistency has been developed in
14 accordance with the policies within the Coastal Zone
15 Management Program document.

16 Q. And if a person or entity intended to conduct
17 an activity that required certification under a general
18 certification --

19 A. Uh-huh.

20 Q. -- what is the process?

21 MS. MARTINEZ: Object to the form of the
22 question.

23 BY MS. LENHARDT:

24 A. It is the same -- essentially, it's the same
25 process as an individual. It stays with different

1 staff because those already have, sort of, a framework
2 to be evaluated under. But it is reviewed
3 administratively. Does it meet the standards set forth
4 in the general coastal zone consistency? And, if it
5 does, they are granted coverage under that. If it does
6 not, then it is moved over to an individual review and
7 assigned to a different project manager.

8 Q. So if the staff concludes an application does
9 not meet the terms of a general certification, there is
10 further review by the agency?

11 A. That is correct.

12 Q. Okay. And are requests for coverage under a
13 general certification placed on public notice?

14 A. They are.

15 Q. Okay. Is a -- is a coverage decision under a
16 general certification an appealable action?

17 MS. MARTINEZ: Object to the form of the
18 question.

19 BY MS. LENHARDT:

20 A. I would assume so, based on the language in
21 the statute, that being a department decision. But
22 that general coastal zone consistency coverage is
23 incorporated into whatever the corresponding permit
24 coverage is. So I -- I would imagine the appeal would
25 have to be of the overall project, its permit coverage

Page 20

1 and the coastal zone consistency.

2 Q. Are you aware of any instances where coverage
3 under a general CZ cert was appealed administratively?

4 A. I am. There are some small mines that were
5 covered under a general coastal zone consistency that
6 were appealed.

7 Q. With regard to the general
8 certification itself --

9 A. Uh-huh.

10 Q. -- what is the process for developing that
11 general certification?

12 A. So those are developed by evaluating the
13 project requests that we've got, identifying if there's
14 a need for smaller projects, which could be streamlined
15 in their review. And then we look at, kind of, common
16 characteristics of those. Part of that also is looking
17 to see if the permitting program has a general permit
18 that maybe we could potentially line up a general
19 coastal zone consistency with. And then, we try and
20 develop, with appropriate conditions, to structure it
21 in such a way that a project could be done responsibly
22 with management of the coastal resources. We put that
23 proposed general coastal zone consistency out on a
24 public notice and get comments on that, and then
25 evaluate those comments and see if that requires any

1 kind of changes to the proposed conditions. And then,
2 from there, we move forward with authorizing --
3 finalizing those to then allow for coverage.

4 Q. Is the issuance of that general certificate
5 an appealable action?

6 A. I would think so, yes. That's a final agency
7 decision.

8 Q. Okay. Who makes the decision to pursue the
9 issuance of a general certification?

10 A. Are you talking about, like, the bigger
11 overall or the individual coverages?

12 Q. Is there a staff person or a particular role
13 that -- or employee -- that decides that a
14 certification is the right way to approach the
15 permitting process?

16 MS. MARTINEZ: Object to the form of the
17 question.

18 BY MS. LENHARDT:

19 A. I don't know that I understand that question.

20 Q. If -- what is the decision-making process as
21 to whether or not to issue a general certification?

22 A. I guess, again, I will ask. Are we talking
23 about, like, the -- the larger, overall coastal zone
24 consistency or that coverage that's being applied for?

25 Q. The general.

Page 22

1 A. Okay.

2 Q. When you -- you testified that there are
3 circumstances where the staff decides streamlining is a
4 good idea?

5 A. Uh-huh.

6 Q. How is that decision made within the agency
7 to move towards issuing a general certification?

8 A. Okay. So what we're evaluating is -- it --
9 part of this comes from our reporting process and
10 looking on our numbers and seeing if we're noticing any
11 trends. Are there projects which can be small in
12 nature, again, done responsibly with management of the
13 coastal resources that we could develop a more
14 streamlined process and move those through in a faster
15 way versus having them stand in line with the other
16 2,000 applications that come through for coastal zone
17 consistency in a given year?

18 Q. So is that a decision made amongst you and
19 your staff?

20 A. Yes, that is from myself and my staff.

21 Q. Okay. How many certifications did you say
22 you process a year?

23 A. Right now, we're averaging 2,000 coastal zone
24 consistency requests annually.

25 Q. And how many people do you have?

1 A. Currently, the section has seven staff. They
2 were able to add two additional project managers after
3 I had left. And we are getting ready to onboard five
4 more in the next month and a half.

5 Q. Okay. For an individual certification, is
6 there any obligation for the applicant to provide any
7 notice themselves?

8 A. There is not.

9 Q. So no newspaper notice requirement --

10 A. No.

11 Q. -- there?

12 A. I take that back. Under a federal permit,
13 there is a requirement for a newspaper notice. But
14 that is the only one that requires it.

15 Q. Okay. And how about for general -- coverage
16 under a general -- general certification?

17 A. That does not.

18 (Plaintiff's Exhibit No. 3 marked for
19 identification.)

20 BY MS. LENHARDT:

21 Q. I'm going to show you a copy of what's been
22 marked as Plaintiff's Exhibit 3. Let me just make
23 sure. I thought I had the copies correct, but...

24 MS. MARTINEZ: Can I ask that we give a few
25 minutes for him to review this?

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1 MS. LENHARDT: Certainly.

2 MS. MARTINEZ: Take your time, Chris. Just
3 familiarize yourself with what it is.

4 THE WITNESS: Uh-huh.

5 BY MS. LENHARDT:

6 Q. I'm going to represent to you that that is a
7 copy of a portion of the Coastal Zone Management
8 Program. Do you agree with that?

9 A. I agree with that. That's portions of the
10 Coastal Zone Management Program document.

11 Q. All right. Page 1 of Exhibit 3 is titled,
12 Guidelines For Evaluation Of All Projects.

13 Do you recognize these as the guidelines for
14 evaluation of all projects?

15 A. I do.

16 Q. And do you and your staff apply these
17 policies where there's a certification review?

18 A. Yes, we do.

19 Q. Okay. And I'd like to draw your attention to
20 Number 1, Subsection 7. Could you just publish that
21 Number 7? Say it -- read it out loud for the record.

22 A. Sure. The possible long-range, cumulative
23 effects of the project, when reviewed in the context of
24 other possible development and the general character of
25 the area.

1 Q. And you apply that to all certification
2 reviews, correct?

3 A. That's correct.

4 Q. And do you have any -- what are the elements
5 or standards that you apply when you are evaluating
6 Number 7?

7 A. So for -- for Number 7, we're looking at,
8 what is the project that's currently under review for
9 Coastal Zone Consistency Certification? Where is it?
10 What is the -- the character of that area, looking at
11 spatial data that we have through our GIS system,
12 aerial images, and how that project, as proposed in a
13 given area -- does that fit with what is currently
14 occurring in that area and in that scope?

15 Q. All right. I'm going to come back to that, I
16 think.

17 You said there is no other subdivision of DES
18 that applies these coastal policies?

19 A. That's correct. These are out of the Coastal
20 Zone Management Program document that is part of our
21 authority within Bureau of Coastal Management.

22 Q. If there is a permit that's issued by any
23 other subdivision of DES, does any other subdivision
24 apply these policies?

25 MS. MARTINEZ: Object to the form of the

Page 26

1 question.

2 BY MS. LENHARDT:

3 A. No.

4 Q. Okay. And this -- are you aware of the
5 general subject matter of this action?

6 A. I am.

7 Q. And what is that?

8 A. It's concern over issuance of on-site
9 wastewater septic tank permits in the coast.

10 Q. Okay. Are they -- are -- is the subject of
11 the action all septic tank permits?

12 MS. MARTINEZ: Object to the form of the
13 question.

14 BY MS. LENHARDT:

15 A. I believe just as it relates to the small
16 septic tank permits, as those don't require Coastal
17 Zone Consistency Certification.

18 Q. Okay. And does -- are we in agreement that
19 an on-site wastewater permit and a septic tank permit
20 refer to the same permit --

21 A. Yes.

22 Q. -- or same category of permit?

23 A. Yes.

24 Q. Okay. And in the context of septic tanks,
25 whether or not they are above or below the 1,500

1 threshold, are there policies in the Coastal Zone
2 Management Program that are applicable?

3 A. There are.

4 Q. And I'd like for you to flip through the
5 pages I've given you and determine if the policies
6 applicable to septic tank permits are included.

7 MS. MARTINEZ: Object to the form of the
8 question.

9 BY MS. LENHARDT:

10 A. There are policies included which would be
11 applicable, but it is not all of the policies.

12 Q. Okay. Where -- if you would just tell me in
13 this exhibit where there are policies applicable to
14 septic tank permits.

15 MS. MARTINEZ: Object to the form of the
16 question.

17 BY MS. LENHARDT:

18 A. So in here, you know, if -- if a septic tank
19 permit is requiring a coastal zone consistency review,
20 obviously, the first ten under the guidelines for the
21 evaluation of all projects, there are principles for
22 adequate sewage disposal under Residential Development
23 Policy 1a.

24 There is also a reference to septic systems
25 as it relates to ordinances, which necessarily doesn't

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1 apply to a permit. But there is a reference in 1f,
2 under the Residential Development, for how septics...

3 There are missing policies that could be
4 applicable within the commercial development policies
5 and the wastewater treatment facility policies.

6 Q. Under what circumstances are the policies in
7 the program document applied to septic tank permits?

8 A. Those are applied when a coastal zone
9 consistency is triggered for a septic tank permit,
10 which would be a large system.

11 Q. And what exactly is that trigger that would
12 require a coastal zone consistency?

13 A. It is -- we're directed to, where possible,
14 combine the CZC reviews for state permits. So,
15 typically, we see those on the state land disturbance
16 permit. So if a -- an example that I can provide is,
17 we had a multi-family development. I forget how many
18 buildings and, you know, the parking lot. But included
19 with that was a large septic tank system that's shown
20 on the plans. Under that CZC review, we applied the
21 septic tank policies in addition to the residential
22 development policies, the parking lot policies, and
23 issued one coastal zone consistency for that project.

24 Q. And what is the definition of a large septic
25 tank system?

1 A. Handling more than 1,500 gallons per day.

2 Q. Okay. And the 1,500 gallons per day
3 threshold, where is that located in any of the
4 regulations or the law?

5 A. I believe that's located in the septic tank
6 regulations. But there is also a reference to that as
7 the threshold for the coastal zone consistency review
8 in Chapter 5 of the Coastal Zone Management Program
9 document.

10 Q. Okay. And what -- what does that say? What
11 does Chapter 5 actually say about the 1,500-gallon
12 threshold?

13 A. So the language that's in there, it's on the
14 table of state authorities that require a coastal zone
15 consistency review. And the review is required for
16 on-site wastewater permits for 1,500 gallons per day or
17 more, or nondomestic waste, I believe, is the language.

18 Q. Okay. All right. Let me get you Exhibit 4.
19 (Plaintiff's Exhibit No. 4 marked for
20 identification.)

21 BY MS. LENHARDT:

22 Q. This a copy of what I've marked as
23 Plaintiff's Exhibit 4.

24 Okay.

25 MS. LENHARDT: David, I apologize. I don't

Page 30

1 see --

2 MS. MARTINEZ: That's fine.

3 MS. LENHARDT: I don't mean to ignore you.

4 BY MS. LENHARDT:

5 Q. Do you recognize this Exhibit 4?

6 A. I do.

7 Q. And what is it?

8 A. This is an affidavit that I provided
9 regarding coastal zone consistency review, I believe,
10 in response to this case.

11 Q. Okay. Did you draft this affidavit?

12 A. I worked with my counsel to draft the
13 affidavit, yes.

14 Q. Okay. And do you consider these statements
15 contained in your affidavit to be accurate?

16 A. I do.

17 Q. And sitting here today, you take these -- are
18 these -- are you -- you do not -- sorry. Let me start
19 over.

20 Sitting here today, do you have any concerns,
21 issues about the statements contained in this
22 affidavit?

23 A. I do not.

24 Q. Okay. All right. I'm going to direct your
25 attention to Number 7 --

1 A. Uh-huh.

2 Q. -- on page 2. This -- if you would, just
3 read your statement contained in Number 7.

4 A. Sure. The list of permits in the CMP which
5 are subject to review only includes those permits for
6 wastewater treatment systems or septic tanks that
7 handle more than 1,500 gallons per day or handle
8 effluent other than domestic waste (see attached page
9 V-5 -- in brackets -- [Table 1] from the CZMP
10 document.)

11 In other words, the CZC section does not
12 review permit applications for a wastewater treatment
13 system or a septic tank that handles less than 1,500
14 gallons per day unless it handles effluent other than
15 domestic waste.

16 Q. Okay. So when you state the CZC section does
17 not review permit applications for a wastewater
18 treatment or septic tank that handles less than 1,500
19 gallons per day, with that caveat, is that statement
20 true today?

21 A. Yes, it is.

22 Q. And has that statement always been true?

23 MS. MARTINEZ: Object to the form of the
24 question.

25 BY MS. LENHARDT:

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1 A. To my knowledge, yes.

2 Q. Okay. Has it been true since your employment
3 with DES?

4 A. Yes.

5 Q. All right. Did you -- with regard to Number
6 5 of the 30(b)(6) -- I'm sorry, I'm jumping around --
7 which is the question of any CZ cert of an application
8 for these type of small septic tanks conducted within
9 the past ten years, did you conduct any investigation
10 relating to this topic?

11 A. I attempted to search for any septic permit
12 reviews that the coastal zone consistency section did
13 within our application -- Appxtender is the name of the
14 software. It's where our historic records live.

15 Q. Okay. Are those hard copies that were --

16 A. They're all -- they originally were hard
17 copies, files. They've been scanned. And now they're
18 digital in that database.

19 Q. Are you the only person who investigated this
20 topic?

21 A. For -- for today, yes, that I -- I mean, I'm
22 not sure. I can't speak for, you know, whether David
23 or Sara looked into. But I did, yes. I didn't ask any
24 of my staff to look into this.

25 Q. Okay. You're not aware of anybody else that

1 conducted an investigation as to whether or not
2 certifications were issued for these small septic
3 tanks?

4 A. Not in preparing for today, no. I don't
5 know.

6 Q. Okay. Is there any intention for DES to
7 conduct, in the future, certifications for small septic
8 tanks?

9 MS. MARTINEZ: Object to the form of the
10 question.

11 BY MS. LENHARDT:

12 A. I would say, if there were any intention for
13 DES to perform a certification review, we would have to
14 go through the process to update the program document.
15 Because in Chapter 5, it's very specific as to which
16 state permits that we are reviewing and are -- are --
17 the coastal zone consistency review is applicable to.
18 So we would have to update the program document to
19 reflect any kind of change that...

20 Q. Okay. Is there any other legal authority in
21 terms of a statute or regulation that empowers the
22 agency to undertake certification reviews?

23 MS. MARTINEZ: Object to the form of the
24 question.

25 BY MS. LENHARDT:

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1 A. I -- I -- can you rephrase the question
2 maybe?

3 Q. You mentioned that the policies authorize you
4 to conduct certification reviews; is that correct?

5 A. The policies are part of it, yes.

6 Q. And is there any other legal authority that
7 allows you to conduct these reviews?

8 MS. MARTINEZ: Object to the form of the
9 question.

10 BY MS. LENHARDT:

11 A. So it starts with the -- the statute and the
12 Coastal Tidelands and Wetlands Act, which establishes
13 the Bureau of Coastal Management, directs our
14 regulatory authorities, as well as the functions of our
15 bureau. It directed the bureau to establish
16 regulations and the policies within the program
17 document as the system for how the department would
18 operate. Those are all done under the premise, as
19 well, of the Federal Coastal Zone Management Act as
20 being a federally-approved coastal program.

21 Q. Is it the agency's position that it is not
22 required to certify small septic tank applications for
23 consistency?

24 A. That is correct.

25 Q. Okay. And, again, you are not aware of any

1 instance in which a certification was done for a small
2 septic tank system?

3 A. I am not.

4 Q. Are you aware of whether the agency publicly
5 notices small septic tank applications?

6 A. I do not know.

7 Q. Would that be a question for Mr. Vaughan?

8 A. That would be a question for Mr. Vaughan.

9 Q. Does the agency take a position on what --
10 what are the environmental impacts of a septic tank?

11 A. I think that would be a question for David.

12 Q. Okay. Let me take a few minutes. I might
13 not have very many more questions for you.

14 MS. LENHARDT: Do you mind if we take just
15 a --

16 MS. MARTINEZ: Of course.

17 (A brief recess was taken.)

18 BY MS. LENHARDT:

19 Q. I wanted to ask you a couple of questions
20 about septic tank systems that the agency does issue
21 certifications for.

22 I'd like to direct your attention to page 2
23 of Exhibit No. 3. And you see the policies begin on --
24 about halfway down the page?

25 A. Yes.

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1 Q. Okay. I would like to ask you about a
2 sentence in 1, subsection a.

3 A. Uh-huh.

4 Q. And the -- the subsection A says, Adequate
5 sewage disposal service (septic -- septic tanks or
6 treatment systems) which meet the Environmental
7 Protection Agency, DHEC, and other local health
8 department standards must be provided in residential
9 development plans.

10 Okay, this is what I want to ask you about.
11 Septic tanks should be permitted, where feasible, in
12 low density residential developments when they are
13 designed properly and soils are adequate to ensure
14 against pollutants leaching into surface or groundwater
15 resources.

16 How does the agency apply that particular
17 provision of the policy?

18 A. I -- it's -- typically, it's a question back
19 to the applicant when we see -- in the example that I
20 gave, the multi-family development that had a large
21 system in the back -- is that their viable option
22 for -- for wastewater treatment? Is there municipal
23 sewer in -- in the area? And then evaluating where on
24 the plans that is shown and -- and what would be the
25 drain field around it.

1 Q. Okay. Does the agency have a definition of
2 what is a low density development?

3 A. We do not.

4 Q. And how do you decide whether or not this
5 provision should be evaluated?

6 A. There's flexibility with this provision. You
7 know, the language that's in here is, you know, "should
8 be permitted where feasible." So we have some
9 flexibility in -- in allowing those large systems
10 through the CZC process. It -- it just, kind of, is
11 evaluating, again, kind of, going back to where is it
12 shown on the plans and what's, kind of, around it and
13 where -- where the overall development is going to be
14 located.

15 Q. So does the agency -- is it the agency's
16 position that it has flexibility as to whether or --
17 whether -- whether a low density -- sorry. I'm going
18 to start over.

19 Is it the agency's position that they have
20 flexibility as to what is a low density residential
21 development?

22 MS. MARTINEZ: Object to the form of the
23 question.

24 BY MS. LENHARDT:

25 A. I would say that, you know, the agency

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1 doesn't have a definition for low density residential
2 development. And, again, it's "should be permitted
3 where feasible." So there is language here where there
4 may be times where it's -- it's not feasible to do
5 anything other than a septic tank system and -- in
6 order to treat their sewage. And -- and that would be
7 how that would be applied.

8 Q. Okay. All right. I don't think I have any
9 other questions.

10 MS. LENHARDT: Do you have any questions?

11 MS. MARTINEZ: I don't have any questions for
12 him.

13 MS. LENHARDT: All right. Thank you very
14 much.

15 (The deposition concluded at 12:12 p.m.)
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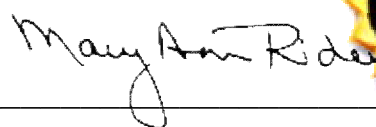
C E R T I F I C A T E

STATE OF SOUTH CAROLINA:
COUNTY OF CHARLESTON:

I, MARY ANN RIDENOUR, Registered Professional
Reporter and Notary Public, State of South Carolina at
Large, certify that I was authorized to and did
stenographically report the foregoing deposition of
Chris Stout; and that the transcript is a true record
of the testimony given by the witness, and was sworn as
such.

I further certify that I am not a relative,
employee, attorney or counsel of any of the parties,
nor am I a relative or employee of any of the parties'
attorney or counsel connected with the action, nor am I
financially interested in the action.

WITNESS MY HAND AND OFFICIAL SEAL this 8th day of
November, 2024, in the City of Charleston, County of
Charleston, State of South Carolina.




Mary Ann Ridenour, RPR, CLR
and Notary Public
My commission expires:
January 13, 2031

Deposition of:

David Vaughan

SCCCL and Charleston Waterkeeper

v.

SCDHEC

Case #: 2022-CP-10-05192

November 7, 2024



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STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS
COUNTY OF CHARLESTON) NINTH JUDICIAL CIRCUIT

South Carolina Coastal Conservation)
League and Charleston Waterkeeper,)

Plaintiffs,)

v.)

Case No.:
2022-CP-10-05192

South Carolina Department of Health)
and Environmental Control,)

Defendant.)

DEPOSITION OF: DAVID VAUGHAN

DATE TAKEN: Thursday, November 7, 2024

TIME: 12:15 P.M.

PLACE: SCDES-OGC
2600 Bull Street
Columbia, South Carolina

REPORTED BY: MARY ANN RIDENOUR, RPR, CLR, CVR-S
and Notary Public

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Page 2

1 A P P E A R A N C E S

2
3 REPRESENTING THE PLAINTIFFS:

4 LESLIE S. LENHARDT, ESQUIRE
5 SC Environmental Law Project
6 510 Live Oak Drive
7 Mount Pleasant, South Carolina 29464
8 (843) 527-0078
9 leslie@scelp.org

10 MONICA K. WHALEN, ESQUIRE
11 SC Environmental Law Project
12 PO Box 1380
13 Pawleys Island, South Carolina 29585
14 (843) 527-0078
15 monica@scelp.org

16 REPRESENTING THE DEFENDANT:

17 SARA V. MARTINEZ, ESQUIRE
18 SCDES-OGC
19 2600 Bull Street
20 Columbia, South Carolina 29201
21 sara.martinez@des.sc.gov

22 ALSO PRESENT:

23 CHRIS STOUT
24
25

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I N D E X

Testimony of David Vaughan

Direct Examination by Ms. Lenhardt.....4

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INDEX OF EXHIBITS

(Plaintiff's Exhibit Nos. 1-4 previously
marked in the deposition of Chris Stout.)

STIPULATIONS

It is hereby stipulated and agreed by and between
the parties hereto, through their respective counsel,
that the reading and signing of the transcript is
waived by the Deponent.

Page 4

1 (The deposition commenced at 12:15 p.m.)

2 DAVID VAUGHAN, SWORN.

3 DIRECT EXAMINATION BY MS. LENHARDT:

4 Q. Mr. Vaughan, can I call you David?

5 A. Certainly.

6 Q. Thank you. Okay. Have you ever had your
7 deposition taken before?

8 A. Yes.

9 Q. I'm going to have to go through this again.
10 The rules require me to tell you some ground rules.
11 First of all, if you have a question about something
12 that I've asked you, if you need clarity, or any other
13 questions you have, please direct it to me and not to
14 your counsel. If -- if you answer the question, I'm
15 going to assume that you understood the question; is
16 that fair?

17 A. Correct.

18 Q. Okay. And we need to make sure that we
19 verbalize our answers and questions so that the court
20 reporter can take down a clear transcript.

21 A. Understood.

22 Q. And let's also try not to talk over one
23 another for the same reason, so that we can have a
24 clear transcript. Is that fair, too?

25 A. Agree.

1 Q. Okay. Let's look at Plaintiff's Exhibit No.

2 1. I believe this is a copy right here.

3 A. Yeah, same one here.

4 Q. Okay, you have the copy. And that is -- we
5 asked Mr. Stout about this, DHEC's notice of deposition
6 pursuant to Rule 30(b)(6). Are you familiar with this
7 notice?

8 A. Yes.

9 Q. And are you prepared to address any of the
10 areas of inquiry identified in this notice?

11 A. Yes.

12 Q. And which ones are you prepared to talk
13 about?

14 A. Leslie, Questions Number 2, 3 and/or -- or
15 subjects --

16 Q. 2 and 3?

17 A. 3 and 6.

18 Q. 2 -- oh, God, I can't write on this one -- 2,
19 3 and 6.

20 And what about Number 4?

21 A. I did --

22 MS. MARTINEZ: I think you mixed up --

23 BY MS. LENHARDT:

24 A. -- I did a quick markup here while we were
25 sitting. 2, 3 and 4, really.

Page 6

1 Q. Okay. I'll just go through for clarity.

2 Number 2 says, The review and approval
3 process that DHEC undertakes in issuing on-site
4 wastewater permits, also known as individual septic
5 tank permits, for those that generate less than 1,500
6 gallons per day of domestic wastewater.

7 Are you prepared to answer questions about
8 that area?

9 A. Yes.

10 Q. 3 is, DHEC's historical and present-day
11 recordkeeping practices for individual septic tank
12 permits.

13 Are you prepared to talk about that area?

14 A. Yes.

15 Q. Number 4 is, Any permits issued by DHEC for
16 individual septic tank permits generating less than
17 1,500 gpd that received a CZCC.

18 Are you prepared to talk about that area?

19 A. Yes.

20 Q. And then, did you say Number 6 or --

21 A. Yeah, but I believe it's mistaken.
22 Everything else you pretty much covered with Chris's
23 testimony.

24 Q. Okay, 2, 3 and 4. All right.

25 And when I ask you questions and I say "you",

1 I'm going to assume that you are speaking on behalf of
2 the agency unless you clarify otherwise; is that
3 correct?

4 A. Yes.

5 Q. All right. And as I mentioned to Mr. Stout,
6 if I refer to DES or DHEC, can we agree that it's the
7 same agency --

8 A. Yeah, I'll agree.

9 Q. -- for purposes of this deposition?

10 Okay. And on the last page of the 30(b)(6)
11 notice, there is a Notice to Produce. Do you see that?

12 A. Here? Second line in that last -- under
13 Notice to Produce, or the entire statement?

14 Q. Feel free to review it as long as you need
15 to. Yeah, are you familiar with this notice that was
16 served on DHEC?

17 A. Yes.

18 Q. And did you bring any documents with you
19 today that are responsive to that?

20 A. No.

21 Q. Okay. David, what did you do to prepare for
22 this deposition today?

23 A. Reviewed the information within this -- this
24 document, consulted with counsel, and even, you know,
25 referenced a regulation, which is, kind of, a daily

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1 basis in my role anyhow.

2 Q. Okay. Did you take -- undertake any
3 investigation of any permitting history or permitting
4 files within DHEC or DES?

5 A. Can you rephrase that?

6 Q. Did you review any records or documents that
7 are in the possession DES in preparation for this
8 deposition?

9 A. No.

10 Q. Okay. Would you tell me your employment
11 history at DES?

12 A. So I am about 29 years into the agency as of
13 last week. Worked for our Bureau of Laboratories to
14 begin with for about three years here in Columbia.
15 Worked for our vector control program with a local
16 health department here in Richland County, within DHEC
17 at the time.

18 Q. Tell me again; what did you say?

19 A. Vector control in Richland County. That was
20 within our local Richland County Health Department's
21 jurisdiction at the time. They contracted with
22 Richland County.

23 Q. And what is vector control?

24 A. Vector control is, essentially, mosquito
25 control, for the most part. But we did do other things

1 at the time, such as, you know, rodent control and
2 nuisances when there was a regulation to enforce that.

3 Q. Okay.

4 A. After that, I worked for several years over
5 in Kershaw County, in our office there, as a
6 sanitarian, working multiple programs in environmental
7 health, including on-site wastewater, general
8 sanitation, rabies, even a lead investigation or two,
9 some foster home stuff, and a little bit of food
10 cross-training.

11 Q. And let me stop you there. What are -- what
12 were your duties in that role with DHEC, specifically
13 relating to on-site wastewater?

14 A. The on-site wastewater there, really, as far
15 as the permitting goes, that was -- a field level staff
16 member, at that point in time, would go out and
17 investigate sites for suitability or not, for the
18 issuance of a permit for a septic system.

19 Q. So --

20 A. And inspect the systems, once they were
21 installed.

22 Q. And that was your job or somebody else's?

23 A. That was a shared job between the multiple
24 people.

25 Q. Okay. But you were a part of that permit

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1 review process? Field review process?

2 A. Uh-huh.

3 Q. Okay. All right. Please continue. Next?

4 A. So from Kershaw County, I moved to Sumter,
5 the office that we had there, doing, essentially, the
6 same role with -- with a different title and some other
7 responsibilities, which led to supervising the entire
8 county's programs and employees there, in addition to a
9 mosquito control program that we ran for Sumter County
10 itself. Contracted with the county and the city of
11 Sumter for about 11 years as we merged into regions and
12 merged bureaus of environmental health and
13 environmental quality control together. That
14 regionalized offices and became a hub there. So those
15 duties expanded to multiple counties. And, in 2015, I
16 went to our regional office here in the Midlands,
17 located at State Park, specifically, at that point,
18 performing on-site wastewater duties because we, kind
19 of, segregated things as we merged in and had more
20 folks to be able to devote to different programs and
21 isolate their -- concentrate their duties. From there,
22 I went to our central offices, the on-site wastewater
23 program manager for the state. And, after -- that was
24 2016. After a couple of years of that, I was given the
25 title of division director, which had multiple programs

1 underneath it. And it was along the division director
2 title, but it included the on-site wastewater program,
3 our rabies program for the state, our enforcement
4 section, as well as a vector surveillance program that
5 is still currently run. As we separated an agency and
6 began separating those programs out that would go to
7 public health versus environmental services, I'm now
8 just solely responsible for the on-site wastewater
9 program across the state as its division director.

10 Q. Okay. Tell me what your duties and
11 responsibilities are as the division director of the
12 on-site wastewater program.

13 A. I oversee the overall management of the
14 program, its policies, regulation, development, things
15 that we deal with our -- with our internet
16 communications, representation for the program,
17 policies, standard operating procedures, things of that
18 nature.

19 Q. How many people do you supervise?

20 A. Directly, currently, I think I'm down to 11.

21 Q. And how many employees are responsible for
22 on-site wastewater permitting review?

23 A. So I'd have to go and verify those to be
24 specific, but I believe we're at 86 field positions
25 currently that we have. And, in total, when you

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1 include our central staff through our customer service
2 and compliance division, the staff that work under me
3 directly in bureau management for -- let me rephrase
4 that -- regional management of the program, we're at,
5 like, 106, I think, total.

6 Q. Okay. How many offices are spread out across
7 South Carolina that -- sorry.

8 How many offices in South Carolina process
9 on-site wastewater permits?

10 A. It's a good question because we've, kind of,
11 reworked the program in the past couple of years. We
12 realigned it and rearranged it from its traditional
13 organizational structure, which would have been located
14 in seven offices -- regional offices -- across the
15 state. We have lots of employees that do some -- are
16 remotely located. And they still answer to regional
17 offices. But I believe we're at -- we're still at
18 seven as a hub.

19 Q. And when you say "located remotely," what do
20 you mean?

21 A. We have staff that are remote headquarters.
22 And they're handling more geographic areas instead of
23 out of one office because of the relocations, the
24 divisions of the agency, us no longer having office
25 space that we did before, you know, and having

1 challenges of 30 staff members and only five places for
2 them to sit, as an example.

3 Q. Okay. Let's talk about the Area of Inquiry
4 Number 2. Tell me how DES processes septic tank
5 permits that generate less than 1,500 gallons per day.
6 What is the review and approval or denial process?

7 A. So, once an application is submitted through
8 our electronic permitting system, it's reviewed for
9 completeness and consistency of everything that's
10 required, such as, are they filling in all the blanks
11 that apply to what they want? Do they include a plat,
12 a description of their property? Do they -- is there
13 another property owner that's involved in the
14 situation? We ask them to give us permission -- a
15 letter of permission to set foot on the property to do
16 our job. Once all that is reviewed, it's assigned to a
17 regional office, which then gets assigned out even
18 further to an individual inspector, who would visit the
19 property, evaluate the site, the soil conditions and
20 the site conditions, and anything else that would have
21 a factor, play a role in permitting. And if they can't
22 issue a permit, they -- it's chosen for one of the
23 designs in Regulation 61-56. And they apply that to
24 the property and the conditions that are there, and
25 issue a permit to construct.

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1 There are also two other ways that that can
2 happen.

3 Q. That what can happen?

4 A. That a permit to construct can be issued,
5 okay? So that's number one --

6 Q. Uh-huh.

7 A. -- with our field staff.

8 Number two is if somebody hired a
9 professional soil classifier to do that site and soil
10 evaluation for them. And if the conditions met one of
11 those appendices or designs that's in the regulation,
12 they could submit the soils work and the system layout
13 to us, all the specifications and parameters of that
14 system. And we can do an administrative review to
15 issue a permit to construct based on their licensure
16 from LLR.

17 If the conditions do not meet one of those
18 specific designs in the regulation, the applicant can
19 take that soils work from the professional soil
20 classifier to a registered professional engineer, let
21 them design a system through one lone standard in that
22 reg. And we would administratively review it for a
23 permit issuance based on both of those licensures
24 involved.

25 Q. Okay.

1 A. So --

2 Q. You mentioned -- oh, do you have -- did you
3 have anything else?

4 A. Yeah. You want me to tell you the whole
5 process, right?

6 Q. Yes, please.

7 A. Okay. So that's issuing a permit to
8 construct.

9 Septic tanks are installed by licensed
10 contractors that the department issues those licenses
11 for. We do final inspections of those systems for
12 compliance with the regulation and the permit that was
13 issued. If we do not, they also have the opportunity,
14 currently, to do some self-inspections and turn that
15 information in on a department-approved form that's
16 created. The engineered permits still have to be
17 installed by a specific level licensed contractor by
18 the department. But the engineer does the final
19 as-built drawings and inspections to approve that what
20 they designed was put in per their design. That gets
21 submitted to us for review and issuance of an approval
22 to operate that system.

23 Q. So for -- and so that we can have an
24 agreement, when I say "small septic tank system," I'm
25 referring to a septic tank system that generates less

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1 than 1,500 gallons per day.

2 A. That's consistent with the regulation.

3 Q. Okay. All right. So when a small septic
4 tank permit is applied for, there are, essentially, two
5 approvals? Are you saying a permit to construct and a
6 permit to operate?

7 A. That's correct.

8 Q. Two separate permits?

9 A. Correct.

10 Q. Okay. And so I understand the circumstances,
11 not every small septic permit application involves a
12 site visit?

13 MS. MARTINEZ: Object to the form of the
14 question.

15 BY MS. LENHARDT:

16 Q. Is that right? Are there permit applications
17 that do not require a site visit?

18 A. No.

19 Q. Okay. So every small septic application --
20 for every small septic permit application, DHEC
21 conducts a site visit; is that correct?

22 A. No.

23 Q. Okay. When is a site visit required?

24 A. Okay. As I explained earlier, if our staff
25 are doing the evaluation, we visit every site and do a

1 specific soil evaluation. If somebody has followed
2 another option through our application process and
3 utilized the services of a professional soil
4 classifier, they're doing the initial site visit.

5 Q. Okay.

6 A. That -- that third option could be decided at
7 that point in time or it could be triggered from our
8 evaluation. And we say that -- this -- the conditions
9 don't meet the regulation -- one of the designs of the
10 regulation. You have the option to go ahead and seek
11 the services of a professional soil classifier and an
12 engineer.

13 Q. What regulations does DES apply in the review
14 of small septic tank permit applications?

15 A. Regulation 61-56.

16 Q. Are all of the standards applicable to small
17 septic tanks contained within 61-56?

18 A. Yes.

19 MS. MARTINEZ: Object to the form of the
20 question.

21 BY MS. LENHARDT:

22 Q. Okay. Are there any other regulations the
23 staff applies when reviewing small septic tank permit
24 applications?

25 A. We apply this regulation to the permitting.

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1 However, occasionally, it bumps into something that's
2 under the purview of another section within the
3 department, such as the Bureau of Water or the Bureau
4 of Coastal Management. So, yes, we are monitoring the
5 conditions that actually are under our wheelhouse or
6 not. And if they're not, we have to either refer to
7 them, work with them, or send the applicant to get
8 permission or acknowledgement from that particular
9 entity before proceeding.

10 Q. What circumstance would trigger, for example,
11 the involvement of the Bureau of Water?

12 A. Well, when -- normally, Leslie, it's working
13 with a larger flow, where we have to set up something
14 that includes financial assurances or review. That's
15 done through the Bureau of Water. And we work with
16 them to issue permits in tandem with one another.
17 That's our -- our biggest one, you know. Or, when
18 there was another setback or something that involves
19 one of their regulations is where we seek that. And
20 when I say "a setback," it could be something that is a
21 floor drain in a facility that's not going into an
22 on-site wastewater system treating domestic sewage.
23 You know, we'd work with -- with another bureau for
24 that, to make sure that somebody is not trying to pull
25 one over on the department and put something in the

1 septic system that doesn't belong there.

2 Q. So as I understand it, you coordinate with
3 other subdivisions of DHEC when required; is that
4 right?

5 A. Yes.

6 Q. Does your section apply any other regulations
7 that other subdivisions apply?

8 A. No.

9 Q. Is Regulation 61-56 applicable statewide?

10 A. Yes.

11 Q. And when your staff is reviewing small septic
12 tank applications in the eight coastal counties, are
13 there any provisions in 61-56 that are applicable only
14 to the eight coastal counties?

15 A. Yes.

16 Q. And what are -- what is that?

17 A. So there are a few standards under certain
18 soil conditions that would apply. And they normally
19 are under those coastal conditions. But something
20 that -- that would apply is -- let's say we're working
21 next to a critical area. We would ask -- we would
22 either have the applicant provide us with a new survey
23 plat that recognizes the department's most recent
24 survey of a critical line or, you know, where -- where
25 their jurisdiction falls, you know, critical area, so

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1 that we can meet required offsets, whatever that may be
2 for that particular system being considered or not. It
3 could prevent you from issuing a permit.

4 Q. Is there a required setback from the critical
5 area?

6 A. Yes.

7 Q. And what is that?

8 A. It depends on the particular design.

9 Q. Okay. Explain that a little bit.

10 A. So some designs, a minimum requirement is a
11 75-foot setback. Other more conservative designs,
12 based on the soil conditions of the site, increase to
13 up to 125 feet.

14 Q. Explain what you -- what is a conservative
15 design?

16 A. A conservative design -- let me -- to answer
17 that, let me tell you what a conventional system is. A
18 conventional drain line is a system with 14 inches of
19 aggregate and a minimum of nine inches of natural cover
20 backfilled on top of it. The -- your offsets to
21 restrictive layers or zones of saturation don't change,
22 no matter what design is implemented.

23 A more conservative design would be something
24 that is put up shallower in the soil, depending on the
25 conditions there -- say it was a high water table

1 present -- up to above ground for some of the mounded
2 system designs that we have. Those -- those are,
3 obviously, in conditions where there's, you know, more
4 conditions at play as far as water table. You're
5 trying to treat things better, do a more quality
6 effluent treatment prior to it getting to -- to that
7 area.

8 So that's -- we're more conservative by
9 having increased setbacks, setbacks to property lines
10 and critical lines.

11 Q. How does the -- how does DES evaluate the
12 level of the water table?

13 A. We do that by using a national standard for a
14 site and soil texture estimation, and looking at soil
15 colors by utilizing a Munsell Color Chart. We teach
16 all of our employees -- standardize them to use that,
17 as well as do soil texture based on the NRCS soil
18 texture guide.

19 Q. And is that evaluation done on the site
20 itself?

21 A. Yes.

22 Q. Okay. Does the design change based on the
23 site visit, ever?

24 A. So when you say "the design," can you be more
25 specific?

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1 Q. You testified there are examples where a
2 conservative design is warranted.

3 A. Uh-huh.

4 Q. Are you concluding there's a more
5 conservative design warranted before or after the site
6 visit?

7 A. It's --

8 MS. MARTINEZ: Object to the form of the
9 question.

10 BY MS. LENHARDT:

11 A. -- so it's based on the evaluation of the
12 site. So, in other words, you're identifying the
13 conditions are there, what Mother Nature has put there,
14 or what somebody else has placed there, and determining
15 the difference between the two and applying the
16 appropriate design standard from the regulation.

17 Q. So I guess I may not understand the
18 application process. When an application is received
19 by DHEC for a small septic tank, is the design
20 proposed?

21 A. No.

22 Q. Okay. The -- what design is going to be
23 installed has not been decided when the application is
24 submitted; is that right?

25 A. No. The application is just submitted for

1 what the person is wanting to do, in other words, what
2 they're wanting to construct.

3 Q. Okay. And that may or may not change based
4 on the site visit; is that correct?

5 A. Depends on the applicant.

6 Q. Okay. I just want to make sure I understand.
7 When you say "what they want to do" --

8 A. Okay. What they want to do is, Do you want
9 to build a home? Do you want to build an office? Do
10 you want to build a restaurant, you know, a commercial
11 facility, something of that nature?

12 Q. Okay, thank you.

13 When we are talking about small septic tank
14 permit applications, does DES place any of those
15 applications on public notice?

16 A. No.

17 Q. Is there any requirement that the applicant
18 take any measures to notify anyone or any entity?

19 A. Is there -- well, I don't know if there's
20 something required locally, so I can't answer that.
21 Now, as far as the department is concerned, we don't
22 have a requirement that they put it on public notice.

23 Q. Okay. For septic system -- on-site
24 wastewater systems that generate larger than 1,500
25 gallons, is there a public notice requirement?

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1 A. From?

2 Q. For DHEC.

3 A. Well, for DHEC, that's -- that's a two-faced
4 answer. Because that question can be answered by Chris
5 from their perspective. But, from the division of
6 on-site wastewater, it's not required to be put on
7 public notice, okay, from Regulation 61-56.

8 Q. Okay. So 61-56 does not have a public notice
9 requirement regardless of the size of the on-site
10 wastewater system?

11 A. Correct.

12 Q. Okay. When your staff receives an
13 application that is located within the eight coastal
14 counties, who determines whether or not a CZ cert is
15 required?

16 A. That's a question for Chris.

17 Q. Do any of your staff make a decision as to
18 whether or not a CZ cert is required?

19 A. Uh-uh. No. Sorry.

20 Q. What is the document retention policy for
21 small septic tank permits?

22 A. So which permit? Could you be more specific?

23 Q. First of all, let me ask about the permit to
24 construct.

25 A. Okay. So a permit to construct has a

1 five-year expiration date unless otherwise affected by
2 a legislative action. So we would retain them for that
3 amount of time, whichever is applicable.

4 The approvals to operate, after they've been
5 issued, have a -- currently, have a 20-year retention
6 schedule per state retention.

7 Q. Are those retention policies contained in a
8 regulation?

9 A. It's in the state retention schedule. The
10 five-year expiration date is within the regulation.

11 Q. And the agency's retention for five years,
12 you said that is in the retention -- the state
13 retention schedule?

14 A. The 20-year retention of a permit that has
15 been installed and approval to operate is in the state
16 retention schedule for the agency.

17 Q. And the state retention schedule, is that in
18 a regulation?

19 MS. MARTINEZ: Object to the form of the
20 question.

21 BY MS. LENHARDT:

22 A. It's not in this regulation.

23 Q. Okay. So you -- you are not aware if it is
24 contained in any regulation?

25 A. I would have to go back and research that for

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1 you, Leslie.

2 Q. With regard to the permit to construct, after
3 five years, what happens to the permits within DHEC?

4 A. So if -- if they fall within that expiration
5 date and do die at the end of that time, they are
6 purged. We go through our agency-approved internal
7 process for document destruction, both physically and
8 electronically. Now these documents are in
9 e-permitting, so it's, pretty much, all electronic.

10 Q. And for the permit to operate that has the
11 20-year time frame --

12 A. Uh-huh.

13 Q. -- does DHEC retain those permits for 20
14 years?

15 A. Correct.

16 Q. And after the 20 years, what happens to the
17 permit?

18 A. Same process as far as the state retention
19 schedule and -- and the destruction of records.

20 Q. Do all of your staff have access to the
21 records that document the permits?

22 A. Yes.

23 Q. Can one of your employees go on the database
24 and locate an issued permit?

25 A. They have the ability to.

1 Q. Fair enough. Fair enough. What about permit
2 denials?

3 A. So that's --

4 MS. MARTINEZ: Object to the form of the
5 question.

6 BY MS. LENHARDT:

7 A. What -- what about them?

8 Q. Do -- does the agency retain any permit
9 denial documents?

10 A. Yes.

11 Q. And how long do they retain them for?

12 A. I believe that's three years.

13 Q. When there is a proposed residential
14 development in South Carolina, and the development
15 seeks small septic tank permits for that development,
16 are those septic tank applications reviewed
17 individually?

18 A. Yes.

19 Q. Typically, does a development -- typically,
20 does the agency receive septic tank permit applications
21 for a particular development as a group?

22 A. Generally, yes.

23 Q. Okay. Do any of your staff review one of --
24 in the context of a proposed development where there
25 are multiple septic tank applications, does the staff

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1 consider the number of septic tank applications that
2 are being submitted for that development?

3 A. Consider in what manner?

4 Q. Does the agency take into account the fact
5 that a septic tank application is one of, say, 25?

6 MS. MARTINEZ: Object to the form of the
7 question.

8 BY MS. LENHARDT:

9 A. Well, we're reviewing them on an individual
10 basis. So, I mean, that would be in -- so you're --
11 you're asking something -- for an answer. But I don't
12 know if you're aware that anything that has ten or more
13 lots proposed for development has to go through a
14 professional soil classifier through the developer. So
15 they're submitted to us through that process. It may
16 come in, in one or 100. But we're reviewing every
17 individual application still.

18 Does that answer your question?

19 Q. It does, thank you.

20 A. Okay.

21 Q. Are you also in charge of the septic tank
22 enforcement program?

23 A. No.

24 Q. Who is?

25 A. Tim Kinney is the division director's name

1 over the enforcement program.

2 Q. Do you ever coordinate with his section?

3 A. Often.

4 MS. MARTINEZ: Object to the form of the
5 question.

6 BY MS. LENHARDT:

7 Q. And how -- how do the two subsections work
8 together?

9 A. Well, on cases where there's been a violation
10 identified, you know, whether that's by a member of the
11 public or one of our own staff -- generally, it's from
12 an installer who, you know, didn't do something
13 according to a permit, or if they were doing outside of
14 their -- their jurisdiction or outside of the
15 regulation. We work together on that.

16 And if there is a malfunctioning septic
17 system, you know, identified for investigation, they
18 normally handle that on their own as far as the civil
19 investigation and enforcement. But, occasionally, it
20 does come through my office.

21 Q. Does the enforcement section have a document
22 retention policy?

23 A. Yes.

24 Q. What is that?

25 A. I don't recall off the top of my head. I'd

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1 have to look it up.

2 Q. Where would you look it up?

3 A. I would look it up off of our agency's --
4 our -- you know, our internal SharePoint stuff. But
5 you can certainly look that up, the state retention
6 schedules. It's public information.

7 Q. Okay.

8 A. In other words, our internal copies are what
9 you can see externally. No difference.

10 Q. Does your section receive notifications or
11 does your section receive complaints about particular
12 septic systems?

13 A. Yes.

14 Q. And what do you do with those complaints?

15 A. It depends on the nature of the complaint.
16 If it's a complaint about a malfunctioning septic
17 system, we either refer that to one of the regional
18 staff members to investigate or we refer the
19 complainant to a system that we have online called
20 REPORT IT!, where they can actually -- it's an
21 environmental complaint reporting system for anything
22 that can be triaged there -- and let the actual
23 complainant fill in the information that they're
24 witnessing and they're concerned about. And then, that
25 gets routed electronically to the appropriate

1 investigative office to work.

2 Q. And is the investigative office under you or
3 under the enforcement section?

4 A. Well, the enforcement section doesn't
5 supervise those staff. Those are regional staff. Most
6 of them are doing the same things as everybody else as
7 far as the review and issuance of permits.

8 Q. Does DHEC or DES conduct any inspections of
9 septic tanks once they are installed?

10 MS. MARTINEZ: Object to the form of the
11 question.

12 BY MS. LENHARDT:

13 A. Yes, rephrase it.

14 Q. I will rephrase it.

15 Does DES conduct any routine or regular
16 inspections of septic tank systems once they are
17 installed?

18 A. No, other than that installation inspection
19 for approval.

20 Q. Okay. For small septic tank systems, does
21 the owner or operator of that system -- is there a
22 requirement that the owner or operator of that system
23 maintain the septic system?

24 A. Yes.

25 Q. Where is that requirement?

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1 A. In the Regulation 61-56.

2 Q. In the same regulation, okay.

3 A. Which I can look it, up if you want.

4 Q. I can -- no, thank you.

5 A. Okay.

6 Q. And just to be clear, in the eight coastal
7 counties, do any of your staff apply policies of the
8 Coastal Management Program?

9 A. That is a responsibility for the Bureau of
10 Coastal Management.

11 Q. So you agree with me that your staff --
12 meaning the on-site wastewater staff -- does not apply
13 any policies in the Coastal Management Program?

14 A. The on-site wastewater staff are applying the
15 policies and, you know, rules within the Regulation
16 61-56, not within another one.

17 Q. So if we're talking about the Coastal
18 Management Program, your staff does not review any of
19 those policies in the eight coastal counties; is that
20 correct?

21 A. That is correct.

22 Q. Okay. Are you -- with regard to Number 4,
23 you said you were prepared to address this area of
24 inquiry, correct?

25 A. Yes.

1 Q. Did you do any investigation in order to
2 discuss Area of Inquiry Number 4?

3 A. It wasn't necessary.

4 Q. Why not?

5 A. Because we don't issue permits for individual
6 septic systems less than 1,500 gallons per day that
7 require a CZC review. Now, I can't speak for those
8 that came before me, if somebody might have done that
9 in the past. That's why there was no -- no, you know,
10 research necessary. Because, to my knowledge, there's
11 none -- none there.

12 Q. And you've been in the on-site wastewater
13 section for how many years again?

14 A. 2001. Does that sound about right?

15 Q. 2001?

16 A. Twenty-three.

17 Q. And you're not aware of any instance in which
18 a small septic permit received a CZ cert?

19 A. No, I am not aware of that.

20 Q. For larger septic tank systems, is the
21 recordkeeping policy or document retention policy any
22 different than what you described for small septic
23 systems?

24 A. Yes.

25 Q. And how it is different?

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1 A. We keep them forever.

2 Q. Is there a basis for differentiating on the
3 policy?

4 A. Absolutely.

5 Q. What is that?

6 A. Because of the complexity of the systems and
7 the designs. So large systems have a much longer,
8 in-depth process before approvals can be done. In
9 other words, it may take several months instead of one
10 to two visits to a site and then working with the
11 applicants or working with, sometimes, soils work
12 folks, with engineering firms and professional
13 engineers. And also, like I said, we're working with
14 other bureaus to make sure that their permits are
15 issued in tandem that may affect the particular -- you
16 know, there's different categories of a large system.
17 But everything over 1,500 gallons still applies. So
18 when there's -- you know, it could be thousands of feet
19 of an on-site wastewater system in the ground. And
20 that changes hands, you know, from owner to owner.
21 It's, kind of, tough to tell somebody to -- Look, we
22 don't retain this anymore. You need to go identify the
23 entire system. Prove to us what you've got and its
24 working order.

25 Q. Does DES regularly inspect those larger

1 septic tank systems?

2 A. No.

3 Q. And I believe you testified there is no
4 requirement for public notice in the regulations. And
5 that is true regardless of the size --

6 A. Uh-huh.

7 Q. -- correct?

8 Does DHEC actually publicly notice larger
9 septic system?

10 MS. MARTINEZ: Object to the form of the
11 question.

12 BY MS. LENHARDT:

13 A. Rephrase.

14 Q. Are there circumstances under which larger
15 septic systems are placed on public notice?

16 A. Not to my knowledge currently.

17 MS. MARTINEZ: Object to the form of the
18 question.

19 BY MS. LENHARDT:

20 Q. How long are permits for larger septic
21 systems valid for?

22 A. Still the same. Five years unless, you know,
23 affected by a legislative action.

24 Q. And those -- do those also have both a permit
25 to construct and a permit to operate?

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1 A. Absolutely.

2 Q. So the same time frame works for those, as
3 well?

4 A. Correct.

5 Q. Okay. Is there any procedure for DHEC to
6 monitor compliance with the terms of a small septic
7 permit?

8 MS. MARTINEZ: Object to the form of the
9 question.

10 BY MS. LENHARDT:

11 A. Once it's placed into operation?

12 Q. Yes.

13 A. No.

14 Q. All right. Let's take another break and see
15 if I can clean this up.

16 (A brief recess was taken.)

17 BY MS. LENHARDT:

18 Q. I asked you questions about 61-55, and you --
19 -56. I asked you questions about 61-56. And you, I
20 believe, testified that an example of a provision that
21 is applied in the eight coastal counties was an offset
22 from the critical area?

23 MS. MARTINEZ: Object to the form of the
24 question.

25 BY MS. LENHARDT:

1 Q. From the -- you testified that 61-56 contains
2 a standard for offsets from the critical area line; is
3 that right?

4 A. Correct.

5 Q. Okay. Are there any other standards in 61-56
6 that are specifically applicable in the eight coastal
7 counties?

8 A. Yes.

9 Q. And what are those?

10 MS. MARTINEZ: For the record, he's referring
11 to 61-56. I don't think we need to mark it
12 because it's a --

13 MS. LENHARDT: It's a --

14 MS. MARTINEZ: -- reg.

15 MS. LENHARDT: -- yeah.

16 BY MS. LENHARDT:

17 A. So I can point out a couple and let you look
18 up the rest. Or we can spend the time and go through
19 each and every one of them. Because there are all
20 these appendices here that go through. And the further
21 you get, a lot of times, the more -- not necessarily --
22 I was going to say more -- more conservative they are.
23 But you have an ultra shallow placement system up here.
24 But when you get down into where you see mounded
25 infiltration systems, such as Appendix N-0, elevated

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1 infiltration system, specialized on-site wastewater
2 systems, which are specialized systems most people will
3 commonly refer to as an engineered system, because it
4 involves an engineer at that point for those to be
5 done, those all involve increased setbacks to critical
6 area lines.

7 Q. Okay. So just describe, generally, what the
8 appendices are in that regulation.

9 A. The appendices are designs, standards for
10 permits to be issued.

11 Q. And according to what you testified to, there
12 are certain designs that only are authorized in the
13 eight coastal counties?

14 MS. MARTINEZ: Object to the form of the
15 question.

16 BY MS. LENHARDT:

17 A. It depends on the site conditions.

18 Q. Are -- are those appendices designs that
19 could be installed anywhere in the state?

20 A. If the conditions were suitable for the
21 design, yes.

22 Q. So aside -- well, you said there were other
23 examples of critical area or -- I'm sorry -- coastal
24 zone specific standards in the regulations; is that
25 right?

1 A. Within these particular standards is where
2 they're going to come into play.

3 Q. And so you said there are specific standards
4 in 61-56?

5 A. Uh-huh.

6 Q. Is that right?

7 A. Correct.

8 Q. Okay. And I do not want to go through
9 61-56 --

10 A. I didn't think you would.

11 Q. -- with you. But do you know, sitting here
12 today, some of those standards?

13 A. I just mentioned one, the -- the specialized
14 standard, or 610, which in here is Appendix Q --

15 Q. Okay.

16 A. -- for a specialized on-site wastewater
17 system.

18 Q. So you would say the -- the offset from the
19 critical area line, the appendices you pointed to. Are
20 there any other that you know of today?

21 A. Yes. But I would want to go through them
22 individually just for consistency, because we do have a
23 general statement included in multiple appendices.

24 Q. And what does that general statement say?

25 A. Well, that statement may say, you know, Has

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1 an increased offset to any critical area, you know,
2 established critical area zones. You know, if it's in
3 a wetland, it may require an Army Corps of Engineers
4 review before proceeding for permitting, things of that
5 nature. You know, tide -- mean -- mean high water
6 mark, you know, in tidal areas, those -- those types of
7 statements are associated with those systems --

8 Q. Okay.

9 A. -- and greater offsets to those areas for
10 protection.

11 Q. All right. And then, relating to the
12 retention of the permits to construct and the permits
13 to operate, when a permit expires and DHEC gets rid of
14 the documentation or the permit itself, how does DHEC
15 determine compliance on a case-by-case basis if there
16 is no permit to review?

17 A. So compliance of a functioning system that
18 has been installed on someone's property? Is that what
19 you're asking?

20 Q. If DHEC gets a request to inspect an old
21 permit for any reason, and that request for an
22 inspection is after the permit is no longer retained by
23 DHEC, how does DHEC determine if it's in compliance or
24 not?

25 MS. MARTINEZ: Object to the form of the

1 question.

2 BY MS. LENHARDT:

3 A. We're getting requests to inspect systems
4 based on a function or malfunctioning situation, not
5 just random requests for compliance to go out. So if
6 somebody needs a system inspected, we refer them to a
7 licensed installer to go do that. However, our
8 approach to investigating a malfunctioning system is
9 consistent, no matter what the cases is.

10 Q. Okay. I think that's all the questions I
11 have. Thank you.

12 MS. LENHARDT: Do you have any?

13 MS. MARTINEZ: I don't have any questions.

14 MS. LENHARDT: All right. Thank you very
15 much.

16 (The deposition concluded at 1:21 p.m.)

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C E R T I F I C A T E

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STATE OF SOUTH CAROLINA:
COUNTY OF CHARLESTON:

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I, MARY ANN RIDENOUR, Registered Professional
Reporter and Notary Public, State of South Carolina at
Large, certify that I was authorized to and did
stenographically report the foregoing deposition of
David Vaughan; and that the transcript is a true record
of the testimony given by the witness, and was sworn as
such.

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I further certify that I am not a relative,
employee, attorney or counsel of any of the parties,
nor am I a relative or employee of any of the parties'
attorney or counsel connected with the action, nor am I
financially interested in the action.

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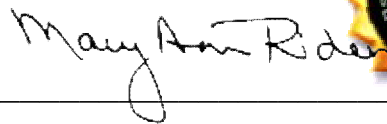
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WITNESS MY HAND AND OFFICIAL SEAL this 8th day of
November, 2024, in the City of Charleston, County of
Charleston, State of South Carolina.



Mary Ann Ridenour, RPR, CLR
and Notary Public
My commission expires:
January 13, 2031

STATE OF SOUTH CAROLINA	*	COURT OF COMMON PLEAS
	*	
COUNTY OF CHARLESTON	*	TRANSCRIPT OF RECORD
-----X		
SOUTH CAROLINA COASTAL	*	
CONSERVATION LEAGUE and	*	
CHARLESTON WATERKEEPER,	*	
	*	
Plaintiffs,	*	
vs.	*	Case No. 2022-CP-10-05192
	*	
SOUTH CAROLINA DEPARTMENT OF	*	
HEALTH AND ENVIRONMENTAL	*	
CONTROL,	*	
	*	
Defendant.	*	
-----X		

February 26, 2025

B E F O R E:

The Honorable Frank R. Addy, Jr., Presiding Judge

A P P E A R A N C E S:

Leslie Lenhardt, Esq.
Attorney for the Plaintiff

Brad Churdar, Esq.
Joseph Giordano, Esq.
Attorneys for Defendant

Recorded by: WebEx Recording

Court Transcriber: Bobbi Fisher, RPR
SC Official Court Reporter III

I N D E X

DESCRIPTION	PAGE
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E X H I B I T S

(None.)

COURT REPORTER/TRANSCRIBER LEGEND

Dash (--)	Indicates an interruption in speech
Ellipses (...)	Indicates trailing off in speech
(ph)	Indicates phonetic word
[sic]	Indicates the word is written as said
(Indiscernible)	Indicates word(s) is not known due to poor audio recording quality

P R O C E E D I N G S

(The following proceedings started at 2:03 PM:)

THE COURT: All right. We have started recording. It is 2:03 -- 2:03 on February the 26th, and we are addressing Case No. 22-CP-10-5192. These are basically cross-motions for summary judgment.

And for the benefit of everyone in attendance, please do note that the Court does not have a court reporter. The Webex recording will serve as the official record, and should you desire or otherwise need a transcript of these proceedings, please fill out the proper form, email same to Court Administration, and if you can't find a form on the website, give them a call. They'll be more than happy to help you and charge you the prevailing rate for preparation of a transcript.

I have had an opportunity to review everything that has been submitted in this case, and my understanding is that this relates to septic tanks, the manner in which DHEC permits those, and I believe that the filings indicate that, currently, they permit tanks which have a capacity of excess than -- excess of 1500 gallons per day.

And I think Coastal Conservation is essentially taking the position that state law requires DHEC to do more and that, of course, the prevalence of septic tanks in construction where septic tanks are used in environmentally sensitive

1 areas, particularly along the coast, is of major point of
2 concern, and they would like to see DHEC essentially keep
3 track of all tanks that are permitted going forward regardless
4 of the size.

5 And, again, they take the position -- Coastal
6 Conservation takes the position that state law essentially
7 mandates that DHEC do more than they are currently doing in
8 order to protect ecologically sensitive areas along the coast,
9 which doesn't drain well, just like in Greenwood where we have
10 lots of mud.

11 What have I missed?

12 MS. LENHARDT: Your Honor, can you hear me okay?

13 THE COURT: Yes.

14 MS. LENHARDT: I am a Leslie Lenhardt, and I'm
15 representing the plaintiffs, the Coastal Conservation League
16 and Charleston Waterkeeper. And if it suits you, Your Honor,
17 I'd go ahead and make my arguments in support of our Motion
18 for Summary Judgment.

19 THE COURT: Sure, go right ahead.

20 MS. LENHARDT: And Your Honor has a pretty good handle on
21 the essence of our case with, I imagine, a short period of
22 time to review it.

23 The underlying action is declaratory judgment as you --
24 and as you basically and concisely said. We are asking the
25 Court to rule that DES has a requirement to review all septic

1 permit applications, not only the ones that are larger than
2 1500 gallons per day, but even the smaller ones, which
3 essentially consist of all the individual septic tank permit
4 applications.

5 We believe the law requires DES, formerly DHEC, to review
6 all state and federal permits, including septic tanks, under
7 the State's coastal management policies and to certify that a
8 particular permit application does not contravene those
9 policies.

10 We also take the position of DES's failure to publicly
11 notice the septic tank permit applications violates the
12 public's rights to due process.

13 And with regard to the Coastal's own consistency
14 certification process for context for Your Honor, the Coastal
15 Tidelands and Wetlands Act authorizes and requires DES, the
16 Department, to create something called the Coastal Management
17 Program, or CMP. It's actually a creature of federal statute.

18 And in the eight coastal counties, which is referred to
19 as the coastal zone, the State has a requirement to review and
20 certify all permits in those coastal counties; the reason
21 being, that all of the counties along the coast have
22 particular and unique environmental circumstances that make it
23 necessary to look at a permit more closely -- sea level rise,
24 low water tables or high water tables, those kinds of things
25 that make it particularly challenging to look at permits like

1 this in the coastal zone.

2 The authority for the Coastal Management Program, the
3 particular provision in the Coastal Tidelands and Wetlands
4 Act, is contained in 48-39-80, and it requires the recreation
5 of a system -- and I talk about the actual language in a
6 moment in order to review those permits for consistency.

7 The CMP is a little bit unique. It was approved by the
8 legislature. It's been recognized by the Supreme Court as
9 having the force and effect of a regulation, although the
10 process for approval was a little bit different, but it
11 contains policies that are directly -- both directly and
12 indirectly applicable to septic tank permitting, one of which
13 is in Chapter 3 of the CMP that says that septic tanks are
14 adequate where development is limited but can have major
15 environmental impacts in densely populated areas.

16 The residential developmental policies also apply when
17 you're looking at septic tank installations. That policy
18 provides that septic tanks should be permitted only for
19 low-density developments when they are designed properly and
20 soils are adequate, and they also say that it's a primary
21 concern to adequately treat and dispose of domestic sewage
22 from those residences.

23 So there also is a more general policy that is very, very
24 important when you're talking about installing numerous septic
25 tank permits within one development, and that is that the

1 cumulative impacts of a project need to be evaluated. So one
2 septic tank should not be looked at in terms of a vacuum but
3 looking at the disturbances and the impact as a whole.

4 So the problem that we have is that the CMP purports to
5 exempt a very, very large category of septic tanks from the
6 certification process, and they are not -- they are reviewed
7 individually and not as a unit. And when this review is not
8 undertaken, what has happened and what continues to happen is
9 that vast numbers of developments in the eight coastal
10 counties are cramming sometimes hundreds of septic tanks onto
11 hundreds of very small lots, some as small as a quarter acre
12 in size, where you have -- in areas that are especially
13 vulnerable to those things like sea level rise. And we
14 identified several of those developments as examples in our
15 Complaint filed in this case.

16 The injury, though, to the members of the Coastal
17 Conservation League, Charleston Waterkeeper, and other members
18 of the public is that the risk and the actual injury is that
19 our coastal waters have been polluted and degraded, and
20 they're harming our members' enjoyment and really health -- it
21 creates a health risk too.

22 So the critical point that Your Honor should consider
23 today is that DHEC is shirking their statutory obligation in
24 carving out these number of permits.

25 Now, going back to 48-39-80, the language is, quote,

1 "DHEC is required," quote, "to develop a system whereby the
2 Department shall have the authority to review all state and
3 federal permit applications in the coastal zone and to certify
4 that these do not contravene the management plan." End Quote.

5 That is a mandatory requirement, and it should not be
6 read to reach an absurd result. It requires the Department to
7 do two things: to review and to certify state and federal
8 permits.

9 Now, you will hear from counsel from DES, I believe, in
10 response, "Well, we did create a system per the statute, and
11 we have the authority but that means we don't have to exercise
12 that authority. We have a cut off of 1500 gallons, and that's
13 enough of a system."

14 And they have presented to you an administrative law
15 court case in support of their argument, which is, obviously,
16 not a judicial decision and not binding on Your Honor, and
17 it's also been appealed.

18 But the system, if you take their interpretation to its
19 logical conclusion, they could refuse to review any permits in
20 the coastal zone, and that would be the system, and that's an
21 absurd result and it's not effectuating the intent of the
22 legislature. The intent of the legislature can be found in
23 the other CMP policies that I've already identified relating
24 to and recognizing problems with septic tank permitting.

25 It's clear from the Coastal Tidelands and Wetlands Act

1 itself, the legislature knew how to provide for permitting
2 exceptions and other exceptions when they thought it was
3 necessary. In 48-39-130, one of the provisions, they identify
4 dredge and fill activities undertaken by the corps, walkways
5 over sand dunes, conservation and research activities.
6 There's pretty specific provisions where they identified that
7 a permitting review does not need to be undertaken for those
8 things.

9 THE COURT: And forgive me for interrupting you real
10 quick, but let me touch on something that you were -- that you
11 alluded to a moment ago under the statement that you made that
12 under -- I'm going to call them DHEC because I'm used to
13 calling them DHEC. Okay?

14 MS. LENHARDT: I am too, Your Honor.

15 THE COURT: So under DHEC's reading of applicable law,
16 they can simply refuse to address any permits or any septic
17 tank regardless of size. And I think, if they were to do that
18 -- and this maybe goes to the crux of what I am -- what I am
19 dealing with, which I'm sure you're going to get to at some
20 point in time, but if they were to do that, I think you've got
21 a very good argument for "Hey, this decision is arbitrary and
22 capricious, their reading of the law simply makes no sense if
23 the very purpose of the law is to regulate these -- these
24 septic systems."

25 After reviewing everything -- I did a little bit of

1 Googling myself. The average household in the United states
2 uses 300 gallons of water per day on average. So we are
3 talking about some systems that are obviously going to be used
4 for individual dwellings, perhaps some that are already in
5 existence where the existing septic tank fails, and so they're
6 going to obviously be putting in a much, much smaller tank
7 than 1500 gallons.

8 And your -- I think the matter that was appealed -- I had
9 it up just a moment ago, but the administrative law appeal
10 where -- you referenced some -- 44 permits for Pulte Homes
11 LLC, for on-site wastewater systems, for peak flow level of
12 less than 1500 gallons per day.

13 I understand that -- you know, I get what your -- I truly
14 get what you're getting at, that the proliferation of a lot of
15 very small septic tanks that fall under that 1500-gallon limit
16 is as bad or maybe even worse than a whole bunch of systems at
17 1500 gallons or more, because people let these things go -- I
18 know this just from living here in Greenwood. People don't
19 service them. They fail. You get a heavy rain, and they
20 don't work. Ethylene gets washed into marshes and other
21 habitats, and that's true whether it's a system designed for
22 1500 gallons or 300 gallons, and you've got a whole bunch of
23 developers that are sticking these things in the ground on
24 postage-size lots where it's not going to be able to handle
25 the -- it's simply, in all likelihood, won't be able to handle

1 the flow, so I get that. And perhaps on a personal level, I
2 agree with you.

3 Help me -- help me get to where they're violating the law
4 in that they are not -- because, on the one hand, requiring
5 public notice for a 300-gallon tank or a tank that can handle
6 300 gallons that's going to be going into some existing
7 dwelling, requiring public notice for that, if the dwelling is
8 already in existence, that's -- I don't know that that's
9 really something that should be required.

10 There's no other alternative at that point in time. The
11 dwelling exists. The people are living there. They're
12 calling it home. And even if it should never have been put in
13 there 20 years ago, the only option for those people is to
14 live in that house.

15 And so you can't really retroactively go back and say,
16 "Okay, well, now we're going to ask for public commentary on a
17 permit for that house."

18 New development? Maybe that's a different question, but
19 how is -- how is DHEC -- how is their decision to review only
20 1500-gallon-plus tanks -- how is that expressly in violation
21 of state law when it seems that the legislature deferred to
22 DHEC to try to -- try to figure out what they can do or what
23 they can work with based on available resources that they
24 have?

25 That was a long question. I'm sorry. You get what I'm

1 getting at?

2 MS. LENHARDT: I do. I do, Your Honor. And before I get
3 to the more ultimate question, just to back up a minute
4 because you mentioned individual septic tanks that are -- you
5 know, for example, a house that's been in your family for
6 generations, we are certainly not taking any sort of position
7 that a septic tank in and of itself is a harmful thing. And
8 we also aren't trying to get a result of retroactively --
9 those permits are issued. Those permits are done.

10 And that's part of the problem with relating to the
11 public notice issue is because, when you do not know whether a
12 permit application has been applied for, there is no way for
13 the public to come in and be notified of that. We would only
14 be talking about individual lots or developments that come in
15 to seek a permit, and I believe DHEC does -- would and does
16 have the resources because they permit -- they publicly notice
17 very -- they publicly notice electronically. It's a pretty
18 streamlined process. And so we can get into, you know, the
19 notice problems -- constitutional notice problems of those
20 permits later.

21 But the 1500 gallon cut-off is -- is arbitrary, and
22 there's no evidence that DHEC has submitted that there's any
23 real basis other than "we just don't want to look at these
24 small ones." And maybe, in 1977 when this Coastal Management
25 Program was approved, it wasn't as critical as it is today,

1 but my -- my argument to you is, it violates the law because
2 the law doesn't differentiate between small and large. The
3 policies in the CMP apply to all septic installations, the
4 ones that are already there.

5 So to have such an arbitrary cut-off when a bunch of
6 small septic tanks, as you recognize, are going to have
7 potentially a worse outcome than a larger system that's
8 designed more specifically to the area. And a larger system
9 will have those coastal zone consistency layers of review.

10 So, again, we're -- we're not asking for a prohibition on
11 permits, but when you have 44 like you do that was in front of
12 Judge Durden, there was -- I mean, it was really a stroke of
13 luck we found out about them, and you have just a very much
14 higher risk of failure when you have all of those.

15 So I would just -- you know, in direct response to your
16 question, I think the Coastal Zone Management Act, along with
17 a couple of other statutes, which I'm going to talk about,
18 too, make it clear that there should not be a demarcation.

19 THE COURT: Okay. And perhaps that was something that I
20 misunderstood. When it came to the notice provision that you
21 were looking for, my impression from what was filed was that,
22 anytime going forward in these eight counties, somebody wants
23 to put a septic system to the ground -- whether it's to
24 replace an existing system or it's new construction -- your
25 position, I thought, was that some sort of notice to the

1 public needs to be had, regardless of whether it was an
2 existing dwelling or new construction.

3 MS. LENHARDT: Well, if it were a new system, yes, we
4 would -- we feel that all -- that all of these septic tank
5 permits -- and not even in the eight coastal counties but just
6 as a general rule should be applied for.

7 Now, if there were some carve-outs for, you know, a
8 system has already been in place and you're repairing it or
9 you're replacing it and not changing, you know, the drainage
10 field and things like that, that would be something, you know,
11 that would be on -- that would be something up to DHEC, I
12 believe.

13 THE COURT: And that's what -- that's kind of what I was
14 getting, that if -- let's assume that that's what I rule.
15 Okay? There needs to be a public hearing. There needs to be
16 a new permit either for existing structures. And so DHEC then
17 goes out there and they said, Okay, well, this house where
18 people are actively living and it's the only place that they
19 have to live and -- you know, we're not talking about a
20 \$5 million estate on Hilton Head, we're talking about a
21 \$75,000 shotgun shack somewhere on the Edisto just outside of
22 Charleston and this needs to be replaced, the septic system
23 needs to be replaced. Oh, gosh, the ground doesn't perk; we
24 can't put one in here.

25 All of a sudden, you've got a house that the only option

1 is going to be an outhouse. And I don't know that that could
2 have been the intention of the legislature, is what I'm
3 saying.

4 MS. LENHARDT: No, I don't believe -- I don't believe it
5 is, Your Honor, and I would just admit that, you know, in
6 terms of the notice, that's a little bit of a separate
7 analysis from, you know, even -- just say you deny the -- you
8 know, you rule that this is not a due process violation, that
9 family, unfortunately, if they do need to put in a new system
10 or an existing system, is going to have to go to DHEC, and
11 they may very well say, you know, there are problems with the
12 site, but that -- you know, certainly, we would hope that
13 wouldn't happen because we don't -- truly, the things we are
14 concerned about are not being able to have -- you know, notice
15 the opportunity to comment and judicial review when there are
16 larger environmental impacts.

17 You know, say you have a property in Awendaw, and you
18 hear through the grapevine that there is a 200-lot -- which
19 has happened -- a 200-lot development, and you go to DHEC and
20 say, "I need to know what the permits." [sic]

21 What they're going to do is come back say, "You need to
22 tell me when the permit application was submitted. You need
23 to tell me what the permit number is. You know, you can
24 submit a FOIA, but we can't guarantee, when you file the FOIA,
25 if there's going to be an application to give you."

1 And if they wait -- if you file it and an application
2 gets submitted, it could be issued well after the time to
3 respond.

4 So if you just -- Your Honor, I'm just trying to sort of
5 paint a picture for the problems that people run into when
6 they're not able to at least know, you know, that something is
7 being applied for.

8 THE COURT: Okay. Let's put -- if we could, let's just
9 put a pin in that real quick, because I want to ask -- I
10 guess, Mr. Churdar, you're on deck for DHEC.

11 But how burdensome would that really be? Somebody's
12 developing a large tract of land, they're putting in septic
13 systems for 45 -- for 45 homes that are going to be located on
14 15 acres of land. Certainly, DHEC has some role or the local
15 zoning people have some role in all of this.

16 Would it really be that onerous to simply say, "Okay,
17 Developer, if you're going to be putting in 45 or 46
18 individual septic systems on this 15-acre plot of land,
19 publish a notice somewhere in the paper or do it
20 electronically."

21 And Ms. Lenhardt says that you've got some sort of
22 electronic method by which you can alert the whole world to
23 it. Would that really be that hard to do?

24 MR. CHURDAR: Your Honor, is that -- is that directed at
25 me?

1 THE COURT: I'm asking whoever knows or wants to answer
2 it.

3 MR. CHURDAR: Okay. I mean...

4 THE COURT: Whoever on behalf of DHEC wants to answer
5 that.

6 MR. CHURDAR: Sure. Okay. Well, I mean, I think that --
7 that the question is -- is -- is not so much the -- whether
8 the burden is too onerous or not on the Department. Judge
9 McCoy, in her Order denying injunctive relief, really, I
10 think, got to the heart of the matter. It's really, I think,
11 a question that is separation of power issues.

12 I mean, she said that the plaintiffs were "asking this
13 Court to 'prohibit the Department from permitting individual
14 'small' onsite wastewater systems that are part of a Larger
15 Common Plan or within 200 feet of a Water of the State in the
16 coastal zone," and then she said, "However, this Court cannot
17 grant the relief Plaintiffs seek via temporary injunction,"
18 and I would say even via summary judgment.

19 And she quotes a couple of cases: Key Corporation
20 Cap. Inc vs. The County of Beaufort. It says, "It is beyond
21 this Court's power to effect a change in the statutes enacted
22 by the Legislature."

23 And then quoting Keyserling vs. Beasley, it says, "This
24 Court does not sit as a superlegislature to second guess the
25 wisdom or folly of the decisions of the General Assembly."

1 THE COURT: And I get that. And I get that. And that --
2 and that's, you know -- that's a -- in the back of my mind
3 too. Okay? That is clearly in my mind.

4 The question, though, DHEC's position seems to be, "Hey,
5 look, we have made a rational decision that we are not going
6 to look at every single septic tank application and these --
7 in these eight counties. We're not going to do that because
8 (A) we've got limited resources; (B) we've made the decision
9 that the legislature can defer to us to decide how to
10 implement this regulation; and we have made the decision that
11 we're going to concern ourselves with 1500-plus-gallon tanks
12 and not anything less.

13 And so if the argument is that you're lacking the
14 resources to look at the smaller size tanks, I think it's a
15 fair question to -- and if the reason that you're doing that
16 is lack of resources and if Ms. Lenhardt is correct that
17 you've got some sort of electronic method by which you can
18 post applications or the permits that are requested, even for
19 smaller tanks, how big of a problem is that going to be?

20 And we're talking about the notice part of this now.
21 Because I -- as I see it, it's kind of like two questions.
22 One has notice. How hard would notice be? The second one,
23 which is maybe a little bit more thorny, would be how hard
24 would giving clearance for, you know, a smaller tank, how hard
25 would that be?

1 Notice doesn't seem to be so hard if they're having to
2 apply for a permit to put in a tank anyway; right?

3 MR. CHURDAR: I would -- I would agree with that. I
4 mean, I think that where we are, though, is -- and I hate to
5 dish -- dish off, but I -- without having talked to Chris
6 Stout, who has -- who has signed an affidavit on behalf of
7 explaining to the Court what the -- what the
8 1500-gallon-per-day effluent limit is and how it's applied,
9 without talking to him, I don't know that I could give you a
10 -- a particular answer as to the burden that that would cause.

11 It may very well be what you're saying. I'm just -- I'm
12 not sure, and I would defer to, you know, what Judge Durden
13 said in her -- both in her Order granting summary judgment to
14 the Department and in her Order denying the Motion for
15 Reconsideration.

16 And, yes, I understand that the plaintiffs are appealing
17 Judge Durden's Order but, nonetheless, you know, those are the
18 Orders that she issued. And she addressed the question of the
19 sufficiency of due process and what that requires of the
20 Department and found that there was not a specific violation
21 of that in the way that the lack of -- lack of notice impacts
22 due process rights.

23 I mean, part of her -- part of her point was, look,
24 you're in court. I mean, and -- and that's the same thing,
25 you know, here today. I mean, they are getting the full

1 measure of due process with -- with this hearing and with the
2 hearing in the Pulte Homes case.

3 THE COURT: Right. And here's where I'm kind of going
4 with that. All right? And Ms. Lenhardt alluded to this a few
5 moments ago that it was just by happenstance that they
6 discovered some of these large developments -- she referenced
7 Awendaw and things like that. Just it so happened that they
8 found out about them.

9 If there's a method -- if there's a method by which
10 notice can be given, because they have -- they have somewhat
11 of a point, that 46 small septic systems, in many ways, is
12 going to be worse than a 1500-gallon or an engineered system.

13 So 46 different septic systems on 15 acres of land, I get
14 what they're saying.

15 If, at the very least -- forget inspection for a moment,
16 but, at the very least, if notice can be given that some
17 developer wants to put in 46 different septic systems on 15
18 acres in Awendaw and let's assume that DHEC has no obligation
19 to inspect those, let's assume I agree with you that DHEC has
20 the right to implement these regulations and draw the
21 regulations as the legislature defers to them, at the very
22 least, notice to the world allows people like the nice people
23 of the South Carolina Coastal Conservation League, when they
24 get notice of something like that, to step in and then say,
25 "Whoa, whoa, whoa, hold on, Zoning Board in Charleston or

1 Zoning Board in Georgetown or Horry, we need to step back.
2 Here why, and here's what you're going to have, and here's
3 what's going to happen when it rains. And by the way, these
4 soils -- this soil is clay. There's not enough sand there.
5 It's not going to drain. Oh, and guess what? You've got an
6 estuary just next door to this development."

7 So that's kind of my point, it allows them to take action
8 even if DHEC doesn't want to or lacks the resources to or
9 feels like it's not empowered under state law to do so.

10 So notice seems to -- if they're already requiring
11 permits, notice seems like a very easy thing to do in this
12 scenario.

13 MR. CHURDAR: Your Honor, I just -- I realized as I -- as
14 I started talking that I should have given a bright line as to
15 the division of labor here. On this Zoom call is Joseph
16 Giordano, who is with the Office of General Counsel as well,
17 and he was going to be handling the due process question. And
18 I have just sat here and started talking to you about it. And
19 the way that I was intending was to handle the statutory
20 question, you know, under 48-39-80.

21 And so, to the extent that he is handling that, I think I
22 probably jumped the gun in speaking over his topics -- or his
23 topic, that one topic.

24 THE COURT: Well, I'm happy to hear from him.

25 I try to push these things along and I try to do that by

1 reading what they're about beforehand.

2 MR. CHURDAR: Right.

3 THE COURT: And, yeah, so if he wants to address that --
4 and the thing is, you know, I feel like DHEC does have a very
5 -- it's a very compelling argument that the way you're reading
6 the regulation, the way that you're implementing the General
7 Assembly, maybe this is not a matter that the courts should be
8 reviewing.

9 There's the argument that should be -- I mean, the
10 argument -- I understand the argument 100% that I need to tell
11 Ms. Lenhardt and the Coastal Conservation people, "I agree
12 with you 100 percent. Let's get some pitchforks and some
13 torches, and let's descend on the State House in Columbia and
14 make our voices heard so that the people down there rewrite
15 this abysmal law to mandate that DHEC has got to preserve the
16 work." I'm with her. I agree generally with that
17 proposition. And I have been to Myrtle Beach in the summer
18 when it rains and it washes into the ocean and kids get sick.

19 So, yeah, this is a problem. I agree that she's got a
20 legitimate beef here. The question is perhaps what can the
21 courts do about it.

22 Now, if Mr. Giordano wants to -- if he's able to weigh in
23 on the notice issue, because I think those are two separate
24 things that they're talking about: notice and inspection.

25 MR. CHURDAR: Your Honor, this has gotten a little bit

1 sideways. This is Brad again. I had more of a flow for my
2 argument rather than kind of taking it in bits and pieces, and
3 I can -- if it -- unless -- I mean, I don't want to hijack the
4 way you want to do it, but I was going to say, if you want to
5 hear from me on the statutory issue and then hear from Joseph
6 on the due process issue, would that be helpful or would
7 that --

8 THE COURT: I was -- I was hoping to kind of break them
9 down but what we're going to do instead is I'll let
10 Ms. Lenhardt finish.

11 MR. CHURDAR: Okay.

12 THE COURT: I'll give the floor back to you. Sorry about
13 that.

14 MS. LENHARDT: Oh, that's fine, Your Honor. And I'll
15 just be brief because you certainly have reviewed this thus
16 far.

17 I would just say, we don't believe that this relief would
18 require you to legislate the -- we believe that you can
19 invalidate the arbitrary threshold because, again, there's no
20 evidence that there was really -- other than just small and
21 large.

22 Because they're -- we're not asking you to rewrite the
23 policies or tell DHEC what policies to apply, but there are
24 already existing policies that need to be applied. And so
25 it's not as though we want to change the standard of review,

1 but you need to capture -- what we take from the position is
2 you need to capture all the permits in the coastal zone
3 particularly when state and federal law has deemed these kinds
4 of permits -- it really can be dangerous to the environment.

5 And I wanted to raise two statutes, Your Honor, really
6 quickly for you. Number one is the Pollution Control Act --
7 South Carolina Pollution Control Act, which says it's unlawful
8 for a person to discharge into the environment organic or
9 inorganic matter, including sewage, which is another
10 recognition of the permitting responsibilities that the State
11 has and also, you know, doubling on that is the additional
12 layer of coastal zone consistency.

13 The second statute is the Federal Coastal Zone Management
14 Act. The Coastal Management Program was created actually to
15 comply with federal law, and it has several provisions that
16 require South Carolina to preserve and protect coastal waters.
17 One is 16 U.S.C.A. [sic] 1452 that says a coastal program
18 should at least provide for the protection of natural
19 resources and to manage coastal development to improve
20 (indiscernible) water quality.

21 Again, the Act also says minimum management measures
22 should be taken to protect coastal waters generally.

23 So there's a tension between that cutoff and the other
24 laws and statutes and regulations that I've pointed to. And,
25 also, addressing your concerns about burden, certainly with

1 regard to the notice, Mr. Churdar didn't give, I don't think,
2 Your Honor, any indication of why it would not be possible to
3 do it.

4 And also, with regard to Judge Durden's Order,
5 Mr. Churdar did say she found no prejudice with regard to
6 that, which is, you know, part of the reason why she denied
7 our due process claim because, as you said, we found out about
8 them kind of by happenstance when we were before the Court.
9 That's not the case in the vast majority of circumstances.

10 And just one other piece for Your Honor's context is
11 there are ways to review coastal policies that are not
12 necessarily requiring them to individually look at, for
13 example, a family home. There are things such as general
14 certifications that DHEC does often where they issue a
15 certification for a specific type of activity and they say,
16 okay, if it's a house that's one acre -- on one acre or larger
17 or, you know, just pick any sort of standard, then that
18 certification will automatically be issued. You will
19 automatically have coverage under that certification.

20 So, you know, that's just addressing Your Honor's concern
21 about the burden, but we do believe in the larger context of
22 the law, the legislature intended for DHEC to review all of
23 these permits.

24 So -- and I believe, Your Honor, that is -- those are the
25 points I wanted to make.

1 THE COURT: Something just occurred to me. Let me -- if
2 I may, let me ask you, Ms. Lenhardt -- and this is a question
3 I genuinely don't know the answer to because I -- again, it
4 just occurred to me, so I haven't really had a chance to maybe
5 look into it and I don't think it's addressed in the briefs.

6 Obviously, in every county you've got a building
7 inspector, you've got a building office, you've got a
8 permitting process that has to be followed. I'm new to this
9 litigation, so I'm asking you, but to what extent are your
10 concerns being addressed or are not being addressed in your
11 experience by local government?

12 Because every time you have a new development -- and I
13 know this from personal experience -- but your local
14 government, usually you've got your NIMBYs -- Not In My
15 Backyard -- that don't want this big development close to
16 their house. You've got them, but you've also got members of
17 County Council who don't want to run water or who don't want
18 to run sewer or are concerned about what the additional
19 development is going to do in terms of straining the road
20 network or the road grid, power grid, things like that.

21 And so, you know, at least in my hometown -- and at
22 Rotary yesterday, we just had the luck to have the planning
23 director come and speak to us for 30 minutes about division --
24 subdivisions that are going up in Greenwood, and she was very,
25 very knowledgeable, and she talked about those sorts of

1 things.

2 But to what extent is local government maybe stepping
3 into the void where DHEC is not? Or can you speak to that?

4 MS. LENHARDT: Well, I can. You know, with regard to
5 local governments, most municipalities are not taking the
6 responsibility for septic tank permitting, inspection, other
7 things like that. I think maybe the Town of James Island has
8 got an ordinance. There are some communities that are taking
9 that on.

10 But, you know, they're not looking specifically at
11 environmental impacts. When you're talking about a town
12 council, planning commission, they're looking at density.

13 And you're right, all the policy considerations of sewer,
14 utility, septic, you know, are complicated, but those kinds of
15 things -- you know, they're passing ordinances and, you know,
16 they do -- local governments have a lot of -- a lot of
17 discretion and a lot of deferences afforded those decisions.

18 So, really, in terms of the septic tank permitting, you
19 know, it's really DHEC who is charged throughout the coast
20 with permitting those.

21 THE COURT: And of course -- of course your local county
22 councils also want to grow the tax base, so anytime you can
23 turn undeveloped farmland into multi-family residential,
24 that's going to enhance the tax base come hell or high septic
25 water. Okay. I got it.

1 Mr. Churdar, whoever else, let me hear from DHEC/DES.

2 MR. CHURDAR: Sure. Your Honor, first of all, I'm not
3 hiding; I can't seem to find the camera, and I apologize for
4 that.

5 THE COURT: That's fine. That's not a problem. We've
6 had a couple of those today.

7 MR. CHURDAR: Yeah. But, anyway, so as I mentioned, I
8 will be handling the -- addressing the CZMA and the
9 interaction between that and the authority granted under
10 48-39-80, and Mr. Giordano will be handling the public
11 notice/due process question.

12 So, as an initial matter, Your Honor, the plaintiffs'
13 argument that the CZMA requires the Department to review the
14 permits for consistency with the Coastal Zone Management Plan
15 is not an accurate representation of the explicit words of the
16 statute.

17 Based on an accurate reading of the statute, it's clear
18 that it doesn't mandate a review of all federal and state
19 permits. Furthermore, the program document, which is required
20 by the Coastal Zoning Management Act in which, under the
21 inspector has been deemed his -- recognized as being
22 equivalent to regulation, implementing the CZMA, that
23 specifically excludes a consistency review on on-site -- of
24 on-site wastewater systems with peak flow less than 1500
25 gallons per day as we've talked about.

1 The Department is required to develop and implement a
2 coastal planning program for the governor and the General
3 Assembly's approval, and 48-39-30 sets forth the policy in
4 implementing the act for the protection of the quality of "the
5 coastal environment and to promote the economic and social
6 improvement of the coastal zone and of all the people of the
7 state." That's a quote from 48-39-30.

8 Specifically, the Act encourages, quote, "The development
9 of coastal resources in order to achieve such improvement with
10 due consideration for the environment and within the framework
11 of a coastal planning program."

12 48-39-50 charges the Department with developing and
13 recommending to the Governor and the General Assembly a
14 comprehensive program designed to promote policies set forth
15 in the Act.

16 Now, 48-39-80 charges the Department with developing,
17 enforcing, and administering the comprehensive Coastal
18 Management Program. Part of the comprehensive program in
19 question in this case is the requirement that 48- -- in
20 48-39-80 that the Department develop a system whereby the
21 department shall have the authority to review all state and
22 federal permit applications in the coastal zone and to certify
23 that these do not contravene the management plan.

24 And part of that system that the -- that is an overlay or
25 maybe a foundation of that was addressed in the affidavit of

1 David Vaughn. That was -- that was submitted at the
2 preliminary injunction stage, and what Mr. Vaughn said is
3 South Carolina Reg 61-56 established a comprehensive framework
4 of system standards, permit procedures, minimum conditions,
5 and other requirements designed to protect the environment and
6 public health from potential wastewater discharges.

7 And then specifically Section 200 under that regulation
8 establishes minimum site, soil, and setback conditions which
9 must be met for approval of a permit application.

10 So that system that is in place is part of the
11 comprehensive program. And while the Department is mandated
12 to include a system in the Coastal Zone Planning Program,
13 which gives authority to review all permits, we are not
14 mandated to review all permits; that the clear words of the
15 statute state that the Department is required to have a
16 program, which we do.

17 The statute clearly says that the program must include a
18 system whereby the Department has the authority to review all
19 state and federal permit applications in the coastal zone and
20 to certify that these do not contravene the management plan,
21 which it does.

22 The Department considered the environmental consequences
23 of a minimum threshold in developing the program document.
24 The Department elected not to require coastal zone consistency
25 certification for all septic permits, but rather, only for

1 those that exceed the 1500-gallon-per-day that we talked
2 about.

3 The Department considered the environmental implications
4 of septic tanks and small on-site wastewater systems and
5 concluded that 1500 gallons per day or less, that's the point
6 when the CZC certification is not required.

7 And the plaintiffs' disagreement with this minimum
8 threshold is not proof of the Department's non-compliance with
9 48-39-80. Having Judge Durden mention this in her Order,
10 having the authority to review is permissive, and there's
11 established precedent that an agency regulation is not
12 required to include items that are permissive in a statute.

13 The required program as set forth in the CZMP program
14 document, it was adopted in 1979, it was refined in 1993 by
15 the General Assembly, and it was approved by the Governor.
16 Its validity, as I mentioned just a moment ago, was upheld in
17 the 2010 Spectre vs. DHEC Supreme Court opinion.

18 The Court need not try to construe the legislature's
19 intent with regard to 48-39-80 and whether DHEC is in
20 compliance with the Act by including the list of the state and
21 federal permits in the plan that it will review because the
22 legislature and the governor's adoption of the plan is clearly
23 the true expression and confirmation of their intent.

24 The program document memorializes the scope of the
25 Coastal Zone Management Plan, and the document is clear as to

1 which permits the Department reviews. What the plaintiffs are
2 arguing, I mentioned that with reference to Judge McCoy's
3 order denying injunctive relief, what they're arguing for is
4 an amendment to the program -- CZMP program document.

5 48-39-80 requires the Coastal Zone Management Plan to
6 provide for a review process of the CZMP, and it does.
7 Chapter 5 -- in Chapter 5 of the CZMP, the document says the
8 way for it to be amended is through the same process that the
9 CZMP document itself was adopted. And this is codified in
10 48-39-90(e), which says, "Any change in or amendment to the
11 final management plan shall be implemented by the procedures
12 established in this section," which are the provisions through
13 which the program document was established, and ending with
14 review and approval of the governor and the General Assembly.

15 The plaintiffs would have this Court usurp the power of
16 the General Assembly and the governor, who adopted the CZMP
17 and confirmed the Department complied with all required
18 considerations set forth in 48-39-80.

19 DHEC's review -- DHEC reviewed -- or not DHEC; I'm in the
20 same boat that you guys are, referring to it as DHEC, but the
21 Department reviews permits for consistency with the CZMA in
22 accordance with the list of permits that are set forth in
23 Chapter 5 of the program document.

24 And this list clearly includes on-site wastewater systems
25 but only those systems that are having 1500 gallons a day or

1 more of domestic wastewater or effluent other than domestic
2 waste.

3 The exclusion of small domestic water on-site wastewater
4 systems has long been in place, and it was even upheld with
5 the ALC as properly accounting for factors, including the
6 Department's lack of direct authority or authority over sewage
7 treatment and disposal, the sheer number of septic tank
8 permits issue within the coastal zone and the design of
9 Regulation 61-56 to ensure that the state water quality
10 standards and adjacent water bodies must be maintained.
11 That's a quote from 61-56.

12 And that ALC opinion, if Your Honor is interested in
13 looking at it, is North -- North Beaufort County Commission
14 vs. The South Carolina Department of Health and Environmental
15 Control. The opinion is a 1996 opinion. The cite is
16 96-ALJ-07-0117-CC. Judge Kittrell was the administrative law
17 judge hearing that.

18 But, anyway, that is -- that is my -- my portion of the
19 Department's case, and Joseph Giordano is going to address the
20 public notice in the due process issues or issue.

21 THE COURT: Okay. While we're on your issue, go ahead
22 and address -- go ahead and address the point that
23 Ms. Lenhardt made and that Judge Durden so adeptly sidestepped
24 that, essentially, the argument was made that you have the
25 authority to review -- or that 48-39-80 says that you've got

1 the authority to review all permit applications. You're
2 exercising your discretion and reviewing only those that
3 involve 1500 gallons or more per day. And like she said a
4 moment ago, what's to prevent DHEC from saying, "You know
5 what? You're right. We have the discretion not to review
6 anything. We have the discretion to say it's only going to be
7 a 2 million gallon tank per day that we're going to review."

8 If taken to the logical conclusion, that seems to be the
9 argument that DHEC is making, and it's a point that Judge
10 Durden didn't exactly address.

11 MR. CHURDAR: Well, Your Honor -- I don't know if you can
12 hear me. I couldn't hear you for part of your question, but I
13 think I've got the gist of it.

14 THE COURT: Okay. Go ahead.

15 MR. CHURDAR: But, I mean, first of all, the point is,
16 the kind of slippery-slope argument, that's not where we are.
17 I mean, you know, the 1500 gallons is not, you know, what she
18 has described as just seeming arbitrary, if I'm saying her --
19 her words correctly or representing her correctly. I don't
20 think it's in accord with -- do you have the affidavit of
21 David Vaughn? He's the director of the division of onsite
22 wastewater within the -- well, what was formerly the Bureau of
23 Environmental Health Services at DHEC. That affidavit was
24 attached to the return to the -- or the -- yeah, I guess it
25 would be the return to the petition for injunctive relief or

1 the Motion for Injunctive Relief. Did you have --

2 THE COURT: Yes. And I'm trying to -- hold on. I want
3 to say that I saw that when I looked at this either last week
4 or over the weekend. Return to Plaintiffs' Motion -- no,
5 that's not it. Hold on.

6 Do this: Can somebody just email that to me? You're
7 going to be able to find it quicker than I am.

8 MR. CHURDAR: Sure. Let's see...

9 THE COURT: David Vaughan -- here, affidavit of David
10 Vaughn.

11 MR. CHURDAR: Oh, you found it?

12 THE COURT: Yeah.

13 MR. CHURDAR: Okay.

14 THE COURT: Dated September something 2023. Yeah.

15 MR. CHURDAR: Right, right.

16 My point, Your Honor, is that, you know, this is -- this
17 is -- the program document is an overlay of the septic
18 permitting process within the eight coastal counties of the
19 coastal zone.

20 So, I mean, it's not -- it's not, you know, just a
21 decision that's made within a vacuum that, "Well, you know,
22 we'll just decide that anything over 1500 requires an
23 individual CZC certification but anything below that, we're
24 okay with it.

25 I mean, it's not like that at all. I mean, he describes

1 in his affidavit the process that goes into approving a permit
2 application for a septic tank. So I think that that is a -- a
3 reality that -- that would mitigate against the argument that,
4 well, the Department can -- can just, you know, waive any kind
5 of a requirement, and -- and it will all be, you know, okay
6 because we have the authority, you know, consider, under --
7 under 48-39-B-11 all land -- lands and waters in the coastal
8 zone for planning purposes.

9 I mean, when you look at the large policies under the
10 Coastal Tidelands and Wetlands Act and in particular,
11 48-39-30, you know, it talks about broad policies protecting
12 the -- quote, "the quality of the coastal environment and
13 promote the economic and social improvement of the coastal
14 zone and of all people of the state."

15 And, I mean, these are very -- very good opposing
16 counsel, and we have been in many, many cases over the years.
17 And so I know Ms. Armstrong is very familiar with the Supreme
18 Court's back-and-forth on the Captain Sams Spit development
19 case, and they were very much using the broad policies under
20 48-39-30 to base a large portion of their -- of their opinion
21 on.

22 And my point is, that's not just kind of high-flown
23 language that has no meaning or no teeth, and we have to
24 comply with the broad policies of the Act, and to just take
25 the position that, for instance, "Well, you know, we're going

1 to waive it" -- an individual's CZC certification for anything
2 that does not reach a 2 million gallon -- or I'm not sure; I
3 think that's what you said, like, 20,000 gallon-a-day effluent
4 discharge, I think would be violating the policies of the Act.

5 So, you know, we aren't there. I mean, we're not talking
6 about something like that. You know, the absurd result
7 argument was not persuasive with Judge Durden, and I don't
8 think it should be persuasive with Your Honor as well given --
9 given those other structures and frameworks and policies both
10 with the Bureau of Water specifically and then the -- within
11 the program document and in the policies and the Coastal
12 Tidelands and Wetlands Act.

13 THE COURT: Okay. Thank you.

14 And let's do this: I've been at this for about an hour.
15 Let's just take a quick five-minute break, and we can return
16 phone calls or use the facilities, whatever the case may be,
17 and then we will resume with -- we will resume with DHEC.
18 Okay?

19 Freda, pause recording, please.

20 It is three-oh--

21 (A recess was taken.)

22 THE COURT: All right. It's 3:18. We're resuming with
23 22-CP-10-5192.

24 All right. Let me hear -- let me hear DES's other
25 argument, please.

1 MR. GIORDANO: Your Honor, may it please the Court. My
2 name is Joseph Giordano. I also represent the South Carolina
3 Department of Environmental Services, also known as DES.

4 As my colleague, Mr. Churdar, stated earlier, I'm here to
5 address the claims in the plaintiffs' motion regarding the
6 Department and its failure or alleged failure to provide
7 public notice for septic permits and applications.

8 Specifically, they argued that this lack of public notice
9 constitutes a denial of their due process rights. I just want
10 to state, first and foremost, that there's no state law that
11 requires the Department to issue public notices for each
12 septic tank permit application or issued permit.

13 Additionally, the Department's regulations, specifically
14 Regulation 61-56, Onsite Wastewater Systems, outlines the
15 requirements for septic systems, but the regulation does not
16 impose a blanket public notice requirement.

17 Additionally, the assertion that the lack of notice or
18 lack of public notice prevents the public of a meaningful
19 opportunity to be heard and for subsequent -- I'm sorry -- to
20 be heard and for subsequent judicial review is not true.

21 My colleague, Mr. Churdar, stated earlier or touched upon
22 this earlier that this case, as well as the case heard in the
23 ALC, is the embodiment of being able to be heard and having
24 judicial review as required by the South Carolina
25 Constitution.

1 A lack of formal public notice procedure for each septic
2 application doesn't equate to the inability to receive notice
3 of a septic tank permitting decision or the inability to
4 timely seek judicial review.

5 THE COURT: Are you -- are you conceding, then, that I
6 have the power to order DHEC to provide notice? Because if
7 they -- if they -- if due process is satisfied by this hearing
8 and the capacity for this Court to order that relief, which is
9 what Plaintiff is seeking, absent some regulation -- I'm
10 assuming you're not conceding that.

11 MR. CHURDAR: No, sir.

12 THE COURT: All right. And I'm sure Ms. Lenhardt will
13 pick up on that in her reply.

14 Go ahead.

15 MR. GIORDANO: As with all the permits, there are
16 multiple state statutes applicable to and followed by the
17 Department that do, in fact, promote transparency and public
18 participation in the decision-making process.

19 For example, in addition to making a request for a septic
20 tank record, such as applications or permitting decisions via
21 the Department's Freedom of Information Office, any member of
22 the public may request notice of permitting decisions through
23 the straightforward process established in the South Carolina
24 Code 48-6-30, which is formerly 44-1-60.

25 THE COURT: May I ask this? Is this information that

1 DHEC collects?

2 MR. GIORDANO: What information specifically?

3 THE COURT: For every -- I want to -- I want to put a
4 septic tank in my home in Awendaw. Is this information that's
5 going to simply go to the local -- to the local building
6 permit office, or is this something that is transmit- --
7 regardless of whether you can say no or not and it's less than
8 1500 gallons, is this something that is collected by DES, that
9 information?

10 MR. GIORDANO: These permits and applications? Yes.

11 THE COURT: Okay. So they are collected by you.

12 MR. GIORDANO: Yes, sir.

13 THE COURT: And they're done electronically?

14 MR. GIORDANO: Yes, sir.

15 THE COURT: Okay. How hard would it be to simply post
16 those somewhere then, if they're already being submitted
17 electronically? Because it -- I'm kind of with you on -- I'm
18 sort of with you on the burden potentially imposed for a
19 permit application approval for every single septic tank. But
20 I'm back to my earlier question that I asked of your
21 colleague.

22 If you're already collecting this information and you
23 have it in electronic format, it would take a 15-year-old
24 child about 30 minutes to figure out a way to correct it, to
25 establish a DES pull-down tab on DES's website where John

1 Smith applied for a 300-gallon septic tank for 108 Taylor
2 Street in Awendaw. If it's already information you collect,
3 it seems like there's no real burden in going ahead and
4 providing it.

5 MR. CHURDAR: Well, Your Honor, with a formal public
6 notice requirement, DES would not have the -- you know, the
7 manpower or resources for that, as well as the significant
8 delay. Because we have 17,000 permits and applications that,
9 you know, we receive and have to approve every year. Going
10 through a formal public notice, you know, procedure, you know,
11 that would cause a significant delay for the permitting
12 process, which would further potentially put an unnecessary
13 burden upon the applicants.

14 THE COURT: Maybe I'm mistaken in what they're asking
15 for. They're asking simply for notice that this permit has
16 been applied for, and not necessarily -- let's assume for a
17 moment that I agree with you, that you don't have the
18 resources or the manpower to inspect each of these 17,000
19 different sites where somebody wants to put in a septic
20 system.

21 And I -- I imagine that the actual number is going to be
22 less because my understanding -- correct me if I'm wrong,
23 somebody, but my understanding is that the Coastal
24 Conservation League is only concerned about eight counties.

25 So it's whatever the septic tanks -- however many are

1 being placed in those eight counties along the coast that
2 would be an issue.

3 And, again, simply noticing that this developer has now
4 asked for 46 tanks on 15 acres and then it falls to the
5 plaintiffs to do whatever they need to do either by way of an
6 injunction or some other action, leave DHEC completely out of
7 it, but it then falls to them to ask the hard questions that
8 they feel like needs to be asked of is this -- is this
9 something that should be allowed or is this developer
10 hoodooing some member of County Council or all of County
11 Council in saying that this clay land is going to perk.

12 It seems like there's no burden whatsoever if you're
13 already collecting the data, and then it falls to whoever else
14 to contest it at some point.

15 MR. GIORDANO: Your Honor, in regards to our
16 capabilities, whether we can post something electronically
17 like that, I can't -- I can't speak on that capability or
18 whether we're able to do that. All I can do is provide the
19 avenues that we can provide to the public currently to access
20 our these documents or permits and applications to review
21 them.

22 THE COURT: Right. But that's my point. If you're
23 collecting them anyway, it doesn't seem like there's any
24 personal protected information in those; it would all be a
25 matter of public record.

1 Frank Addy owns a lot at 106 Arthurs Point, and he wants
2 to put in his septic system. That information is already
3 available on the county GIS, and the fact that I own it is a
4 matter of tax record, so there's no big secret there that I
5 live at that address.

6 And if you're collecting that information anyway, it
7 seems like, at the very least, putting it out there, I'm not
8 -- I'm not saying allow public comment or public notice or
9 whatever on Frank Addy's proposal to put in a septic system,
10 but it does at the very least provide the plaintiffs with the
11 ability to intervene if they feel like this -- they can step
12 in where perhaps you can't or maybe don't want to or are
13 unable to because of manpower limitations. That's my
14 point.

15 MR. GIORDANO: And I understand your point completely,
16 Your Honor. I just -- I can't confirm whether or not the
17 Department is capable of doing that. I can't speak on my
18 Department staff, whether that's something they're capable of
19 doing. I can just simply provide the avenues that we can
20 provide currently.

21 THE COURT: Okay. I do understand your position.
22 Anything else on that?

23 MR. GIORDANO: No Sir.

24 MR. CHURDAR: Your Honor?

25 THE COURT: Yes. I saw you unmuted. Go ahead.

1 MR. CHURDAR: I was just going to say, you know, I mean,
2 just to add just a sentence or two to what Mr. Giordano said.
3 I mean, there is no statutory or regulatory requirements for
4 the Department to provide public notice on these -- on these
5 wastewater system permits.

6 And, I mean, we have two situ- -- well, we've got the
7 Pulte Homes Order or the request for contested case before the
8 administrative law court, and we have this case.

9 And, I mean, the due process aspect of this is -- well, I
10 mean, our courts have seen it as a rather flexible process.
11 And so without the -- without the statutory requirement of
12 that, you know, I think for purposes of a summary judgment
13 motion, I believe that that would be -- it would be
14 appropriate to not grant summary judgment with -- well, with
15 regard to due process but also the issues that I mentioned as
16 well.

17 THE COURT: And I understand your position. I understand
18 the legal position. I understand 100 percent that there is
19 nothing that compels you either through regulation or a law to
20 provide this information; that the discussion I had a few
21 moments ago was really more -- it just seems like it's such a
22 simple thing to do.

23 And to the extent that the plaintiff wants to challenge
24 each and every -- and I understand Plaintiffs' position; they
25 feel like each of those 17,000 septic tank permit

1 applications, each of those should be inspected. I get that.
2 I tend -- and Ms. Lenhardt, I'll let you lead into this since
3 you're pretty much the moving party on this, so you get last
4 word, but I seriously doubt that they have the manpower to
5 inspect all of those. I seriously doubt that it's feasible to
6 allow a public hearing for each of the -- or to make allowance
7 for the potential for a public hearing for each of those
8 17,000 permits.

9 What are your closing thoughts?

10 MS. LENHARDT: Yes, Your Honor. So -- oh, sorry; were
11 you talking to Mr. Churdar? I apologize.

12 THE COURT: No, no. I was talking to you.

13 MS. LENHARDT: Okay, okay.

14 To clarify what due process provides -- and I would also
15 -- I would say, to start off, the fact that there is no
16 statutory requirement doesn't obviate the agency from
17 complying with the constitutional requirements of due process.
18 And when we're talking about notice and an opportunity to be
19 heard, I'm not referring to requiring that there be an
20 inspection of every septic tank.

21 I understand from the process -- we deposed the DHEC
22 employee who sort of oversees these permitting -- they rely a
23 lot of times on an engineer to provide drawings to the agency,
24 and they don't -- they don't have the manpower to inspect.
25 That's a different requirement, and we're certainly not

1 alleging that that's required for all permits.

2 We're also not alleging that a public hearing needs to be
3 scheduled for all of these. It is merely an opportunity for
4 us to take on the responsibility of monitoring the website,
5 which is what we do all the time, even if the notice is short.
6 Say it's 15 days. There is no way for us to find out, unless
7 the timing is specifically just right -- and Mr. Churdar's
8 co-counsel made a point about, well, we have -- we can look
9 under FOIA or we can also request to be notified under the
10 notification statute and appeals process. It used to be
11 44-1-60; it may have changed when the statute -- when the two
12 agencies were split, of the actual site.

13 But we have attached to our memo an email from DES
14 counsel that you've probably already seen where we asked to be
15 notified under that statute -- I think it's Exhibit 9 -- and
16 Ms. Martinez said, "Well, we need to know the applications
17 that you want notice of." How we find that out, I don't know.

18 And so that -- "Any notice to any future application,
19 please resubmit your request at such time as the applications
20 or permit exists."

21 So there's, you know, assuming that there's some
22 mechanism for us to be able to find out about it.

23 So those are -- those are the things that I would say.
24 In terms of the manpower, that kind of goes back to what I was
25 saying before. You know, I don't think the burden on the

1 agency should really, again, obviate the requirements under
2 due process, but they've made some conclusory statements about
3 how it would be a burden, and I don't know that they've ever
4 submitted anything to identify exactly how difficult it would
5 be given what we know that you can certainly take judicial
6 notice of. There are, you know, many, many programs where
7 there are public notices on the website, so...

8 Those are the comments I would -- I would say.

9 THE COURT: I get the Catch-22 that you're in. You've
10 asked DHEC for that information, and they can't provide you
11 that information unless you have that information to ask for.
12 So I get that. That's not lost on me.

13 Talk a little about -- because Mr. Giordano seemed to
14 indicate that due process is being satisfied by your ability
15 to come here into this court and beseech this Court for a
16 remedy which Mr. Giordano says I can't provide without
17 overstepping and stepping into the legislative arena.

18 Due process, how is your organization entitled -- how are
19 you -- this is almost a standing argument, but how are you
20 entitled to notification or due process as it relates to this
21 information?

22 MS. LENHARDT: It does -- it does particularly go
23 because, you know, at least the statute relating to our right
24 to request notice of a permitting decision and take advantage
25 of that appeals process specifically cites to affected

1 persons, and we, as affected persons -- I mean, you do. You
2 obviously have to have standing to be able to challenge and
3 get judicial review.

4 As far as I know, I mean, the only -- there are only --
5 there are a few options. You either notify everybody or you
6 go and notify adjacent property owners directly, which is a
7 way more onerous requirement. We certainly have those
8 requirements in the critical area of permitting within the
9 coastal zone.

10 But I would connect the two, as you mentioned. The folks
11 that are going to be impacted should be entitled to the notice
12 of an application that -- you know, someone who lives in
13 Awendaw is not going to care about a septic tank that's issued
14 in Richland County.

15 THE COURT: And, obviously, your organization's goals are
16 or the scope of your work is not even -- it's not Awendaw
17 versus Richland; it's primarily the coastal zone, so...

18 MS. LENHARDT: Well, I mean, you know, Jasper County --
19 you know, pick a county.

20 But, you know, the reality of it is, is that the dense --
21 you know, South Carolina is one of the fastest growing states
22 in the country in terms of the development, and dense
23 developments are happening and they're happening all
24 throughout the state but they're certainly happening in
25 coastal counties.

1 THE COURT: All right. Everyone, thank you very much.
2 Okay. I'm going to take this under advisement. I'm going to
3 look at this in a little bit harder. And while I am doing
4 that, I have a homework assignment for Mr. Giordano.

5 Out of intellectual curiosity, I'm going to ask that you
6 contact your IT department at DES and ask them to provide me
7 and Ms. Lenhardt an affidavit with a -- a statement would be
8 fine, too. I genuinely do not think it would be difficult, if
9 you're already receiving that permit application
10 information -- as a practical matter, it seems that if, it's
11 already a public record, if it can already be accessed by
12 FOIA, and if it's something that could easily be placed on a
13 website, please inquire informally of them and let them tell
14 me and everybody else if that would even really be that hard
15 to do, and we'll see what they say.

16 And, obviously, being an attorney, they can run it by
17 you, and you can see if there's any legal implications for
18 providing that information in such a -- such a public way.

19 But I'll have it under advisement and, candidly, this is
20 going to be -- this will be probably the third thing I have
21 taken under advisement this week. I've only got four total,
22 though, including these three, so I would like to rule sooner
23 rather than later. And to the extent that that information
24 could be provided, that might be helpful and satisfying, if
25 nothing else, my intellectual curiosity.

1 MR. GIORDANO: Absolutely, Your Honor. We can do that.
2 Do you have a specific date that you would like this
3 affidavit by?

4 THE COURT: You let me know. I don't want to burden -- I
5 don't want to burden anyone unnecessarily. Contact IT and see
6 what they say, see what they think. Because to the extent
7 that Ms. Lenhardt could aid a hand -- her organization could
8 lend a hand in assisting DES in their core mission, I'm
9 certain that y'all would not complain about any additional
10 assistance from the nice people at Coastal Conservation. They
11 can help do your job for you -- or with you as a partner.

12 With that, y'all have a great day.

13 3:41. Freda, you can stop recording.

14 Y'all take care. I appreciate everyone's attention.
15 Thanks.

16 MS. LENHARDT: Thank you, Your Honor.

17 MR. GIORDANO: Thank you, Your Honor.

18 MR. CHURDAR: Thank you. Bye-bye.

19 (The proceeding concluded at 3:41 PM.)
20
21
22
23
24
25

Certificate of Transcriber

CASE NAME: SCCCL, et al. vs. SCDHEC

DATE OF HEARING: 2/26/25

RECORDING METHOD: WebEx Recording

I, Bobbi Fisher, do hereby certify that the foregoing transcript is a true and correct record of the recorded proceedings; that I was not present for the live proceeding; and that said proceedings were transcribed to the best of my ability from the audio and/or video recording and supporting information; and that I am neither counsel for, related to, nor employed by any of the parties to this case; and I have no interest, financial or otherwise, in its outcome.

/s/ Bobbi Fisher

Bobbi Fisher, SC Official Court Reporter III, RPR

Transcript Prepared: 8/14/25

NOTE: PURSUANT TO RULE 607(h)(1)(B), SCACR, "A COURT REPORTER SHALL RECEIVE THE FEE OF \$1.00 PER PAGE FOR FURNISHING A COPY OF A PREVIOUSLY PREPARED TRANSCRIPT." ALL REQUESTS FOR COPIES OF THE ATTACHED TRANSCRIPT (FORM 800) FROM OPPOSING PARTY OR NON-PARTIES MUST BE SENT TO THIS REPORTER AT BFISHER@SCCOURTS.ORG.



**SOUTH CAROLINA
ENVIRONMENTAL
LAW PROJECT**

Lawyers for the Wild Side

PO Box 1380, Pawleys Island, SC 29585 / (813) 527-0078 /
www.scelp.org

Executive Director & General Counsel
Amy E. Armstrong | amy@scelp.org

Senior Manager of Strategy
Michael G. Corley | michael@scelp.org

Senior Managing Attorneys
Benjamin D. Cunningham | ben@scelp.org
Leslie S. Lenhardt | leslie@scelp.org

Staff Attorneys
Lauren Megill Milton | lauren@scelp.org
Emily S. Poole | emily@scelp.org
Madison R. Martin | madison@scelp.org
Monica K. Whalen | monica@scelp.org

May 2, 2024

Sara Martinez, Esq.
SCDHEC
2600 Bull Street
Columbia, SC 29201

Re: Coastal Conservation League & Charleston Waterkeeper v. SCDHEC
C/A No. 2022-CP-10-05192, Requests to Admit

Dear Sara:

Please find for service on you Plaintiffs' Requests to Admit in the above-referenced matter.

Yours truly,

s/ Leslie Lenhardt

Senior Managing Attorney

Attachment

cc: Brad Churdar, Esq.

Board of Directors - Gerald Schulze, Chairperson, Mac Bennett, Keith Bowers, Janielle Ellis, Amy Fabri, Terry Grayson-Caprio, Tom Kester, Bess Lochocki, Esq., Walton McLeod, Esq., Carla Pinckney, Cynthia Powell, Greg VanDerwerker

Board Member Emeriti - Frances Close, John Mark Dean, Robert Schofield

ROA 935

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	FOR THE NINTH JUDICIAL CIRCUIT
COUNTY OF CHARLESTON	)	Case No. 2022-CP-10-05192
	)	
South Carolina Coastal Conservation	)	
League and Charleston Waterkeeper,	)	
	)	
Plaintiffs,	)	PLAINTIFFS'
vs.	)	REQUESTS FOR ADMISSION
	)	TO DEFENDANT
	)	
South Carolina Department of Health and	)	
Environmental Control,	)	
	)	
Defendant.	)	

TO: THE DEFENDANT AND THEIR ATTORNEYS

The Plaintiffs hereby submit, pursuant to Rule 36 of the South Carolina Rules of Civil Procedure, the following requests for admission to Defendant South Carolina Department of Health and Environmental Control.

You are instructed to serve on the undersigned counsel of record within thirty (30) days from service of these requests your answers and/or objections to these requests for admission. Pursuant to Rule 26 of the South Carolina Rules of Civil Procedure, you are further instructed to supplement your responses up to and through the trial of this matter. The definitions set forth below shall govern the following requests for admission as well as your responses to them:

DEFINITIONS

1. The term “documents” as used herein means all original writings of any nature whatsoever and all non-identical copies thereof in your possession, custody and control, regardless of where located, and regardless of whether printed or reproduced by any process, or written and/or produced by hand, or stored in any form of mechanical or electronic information retrieval system, and whether or not claimed to be privileged or otherwise excludable from discovery, and including, but is not limited to, contracts, agreements, records, tape recordings, correspondence, memoranda,

communications, reports, studies, summaries, compilations, abstracts, minutes or records of all meetings including directors, staff, management, and executive officer meetings, notes, agenda, bulletins, notices, announcements, statements, instructions, charts, manuals, brochures, schedules, price lists, telegrams, teletypes, papers, books, accounts, letters, photographs, objects, transcripts of oral statements, court papers or any other tangible thing.

2. The term “concerning” or “concerns” as used herein means referred or referring to, alluded or alluding to, related or relating to, connected with, regarding, describing or reflecting.

3. The terms “you” or “your” as used herein shall mean the Defendant, South Carolina Department of Health and Environmental Control (“DHEC”) and all of DHEC’s present and former agents, employees, representatives, attorneys and all other persons acting on its behalf.

4. The terms “and” and “or” shall be both conjunctive and disjunctive.

REQUESTS FOR ADMISSION

1. Admit that DHEC does not review individual septic tank permit applications, those that generate less than 1,500 gallons per day of domestic wastewater, for consistency with the policies of the Coastal Management Program.

2. Admit that the Coastal Management Program policies relating to septic tanks have not been updated since the policies were approved by the General Assembly in 1979.

3. Admit that DHEC estimates that between ten and thirty percent of septic systems fail to function properly in an average year.

4. Admit DHEC does not place on public notice of any kind individual septic tank permit applications of less than 1,500 gpd.

5. Admit that DHEC is the state agency charged with processing permit applications to construct and operate onsite wastewater systems generating less than 1,500 gallons of domestic wastewater per day.

6. Admit that a permit to construct and operate any new, upgraded, or expanded onsite wastewater system must be obtained from DHEC prior to construction and operation of the system.

7. Admit that a permit to construct an onsite wastewater system is a state-issued permit.

8. Admit that DHEC was required by state law to develop a system that allowed it to review all state and federal permit applications in the coastal zone and to certify that such applications do not contravene the coastal management plan.

Respectfully submitted,

SOUTH CAROLINA ENVIRONMENTAL LAW PROJECT

s/ Leslie S. Lenhardt

Leslie M. Lenhardt, Esq. (S.C. Bar #: 15858)

Amy E. Armstrong, Esq. (S.C. Bar #: 70352)

Physical: 510 Live Oak Drive | Mount Pleasant, SC | 29464

Mailing: P.O. Box 1380 | Pawleys Island, SC | 29585

Phone: (843) 527-0078 | Emails: leslie@scelp.org, amy@scelp.org

*Attorneys for Plaintiffs South Carolina Coastal
Conservation League and Charleston Waterkeeper*

Charleston, SC
May 2, 2024

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	FOR THE NINTH JUDICIAL CIRCUIT
COUNTY OF CHARLESTON	)	Case No. 2022-CP-10-05192
	)	
South Carolina Coastal Conservation	)	
League and Charleston Waterkeeper,	)	
	)	
Plaintiffs,	)	CERTIFICATE OF SERVICE
	)	
vs.	)	
	)	
South Carolina Department of Health and	)	
Environmental Control,	)	
	)	
Defendant.	)	
	)	

I hereby certify, as an employee of the SC Environmental Law Project, that on this date I have served Plaintiffs’ Requests for Admission via U.S. Mail and electronic mail delivery by email to the parties addressed:

Bradley D. Churdar, Esq.
South Carolina DHEC
1362 McMillan Avenue, Suite 400
Charleston, SC 29405
churdabd@dhec.sc.gov

Sara V. Martinez, Esq.
South Carolina DHEC
2600 Bull Street
Columbia, SC 29201
martinsv@dhec.sc.gov

Respectfully submitted,

SOUTH CAROLINA ENVIRONMENTAL LAW PROJECT

Jaya Wragg, Legal Assistant

Charleston, SC
April 17, 2024



June 3, 2024

Leslie M. Lenhardt, Esquire
Amy E. Armstrong, Esquire
South Carolina Environmental Law Project
P.O. Box 1380
Pawleys Island, SC 29585

RE: Coastal Conservation League & Charleston Waterkeeper v. SCDHEC
C/A No.: 2022-CP-10-05192

Dear Counsel:

Attached please find for service upon you DHEC's Responses to Plaintiffs' Requests for Admissions in the above-referenced matter.

Sincerely,

Bradley D. Churdar
Associate General Counsel

BDC/jhd

Enclosures

STATE OF SOUTH CAROLINA
COUNTY OF CHARLESTON

IN THE COURT OF COMMON PLEAS
NINTH JUDICIAL CIRCUIT

South Carolina Coastal Conservation
League and Charleston Waterkeeper,

Case No. 2022-CP-10-05192

Plaintiffs,

v.

DHEC'S RESPONSE TO PLAINTIFFS'
REQUESTS FOR ADMISSION

South Carolina Department of Health and
Environmental Control,

Defendant.

TO: LESLIE LENHARDT, ATTORNEY FOR THE PLAINTIFFS

Pursuant to Rule 21 and Rule 36 of the South Carolina Rules of Civil Procedure, Respondent South Carolina Department of Health and Environmental Control ("DHEC" or "the Department"), by and through its undersigned attorneys, hereby responds to Plaintiffs' Requests for Admissions as set forth below.

1. Admit that DHEC does not review individual septic tank permit applications, those that generate less than 1,500 gallons per day of domestic wastewater, for consistency with the policies of the Coastal Management Program.

RESPONSE: DHEC admits only that it is not required to review individual septic applications that generate less than 1,500 gallons per day of domestic wastewater for consistency with the current Coastal Management Program. DHEC denies the remainder of Request to Admit No. 1.

2. Admit that the Coastal Management Program policies relating to septic tanks have not been updated since the policies were approved by the General Assembly in 1979.

RESPONSE: Admit.

3. Admit that DHEC estimates that between ten and thirty percent of septic systems fail to function properly in an average year.

RESPONSE: Denied. While a percentage of installed septic systems may malfunction, DHEC has not estimated that percentage and has only investigated known malfunctions on a case-by-case basis in accordance with Regulation 61-56.

4. Admit DHEC does not place on public notice of any kind individual septic tank permit applications of less than 1,500 gpd.

RESPONSE: Admit.

5. Admit that DHEC is the state agency charged with processing permit applications to construct and operate onsite wastewater systems generating less than 1,500 gallons of domestic wastewater per day.

RESPONSE: Admit.

6. Admit that a permit to construct and operate any new, upgraded, or expanded onsite wastewater system must be obtained from DHEC prior to construction and operation of the system.

RESPONSE: Admit.

7. Admit that a permit to construct an onsite wastewater system is a state-issued permit.

RESPONSE: Admit.

8. Admit that DHEC was required by state law to develop a system that allowed it to review all state and federal permit applications in the coastal zone and to certify that such applications do not contravene the coastal management plan.

RESPONSE: DHEC admits that the Department is authorized by state law to develop a system whereby OCRM shall have the authority to review all state and federal permit applications in the coastal zone, and to certify that these do not contravene the management plan. The Department has in fact satisfactorily developed a comprehensive coastal management program through its promulgation of the Coastal Management Program. The Department considered the environmental consequences and elected not to require a CZC

Certification for all septic tank permits and “small” onsite wastewater systems, but rather only for those that exceed 1500 gallons per day. DHEC denies the remainder of Request to Admit No. 8.

s/Bradley D. Churdar

Bradley D. Churdar, SC Bar # 12829
South Carolina Department of Health and
Environmental Control
1362 McMillan Avenue, Suite 400
Charleston, SC 29405
(843) 953-0213
churdabd@dhec.sc.gov

Sara V. Martinez, SC Bar #74822
South Carolina Department of Health and
Environmental Control
2600 Bull St.
Columbia, SC 29201
(803) 898-0288
martinsv@dhec.sc.gov

June 3, 2024

Charleston, South Carolina

STATE OF SOUTH CAROLINA

COUNTY OF CHARLESTON

South Carolina Coastal Conservation
League and Charleston Waterkeeper,

Plaintiffs,

v.

South Carolina Department of Health and
Environmental Control,

Defendant.

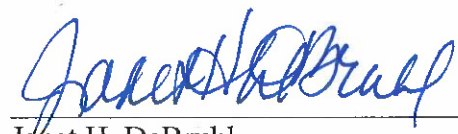
IN THE COURT OF COMMON PLEAS
NINTH JUDICIAL CIRCUIT

Case No. 2022-CP-10-05192

CERTIFICATE OF SERVICE

I, Janet H. DeBruhl, Paralegal with the South Carolina Department of Health and Environmental Control, hereby certify that I have this date served the foregoing *DHEC's Response to Plaintiffs' Requests for Admissions* upon all counsel of record by U.S. Mail and electronically by sending to the addresses indicated below:

Amy E. Armstrong, Esquire (amy@scelp.org)
Leslie S. Lenhardt, Esquire (leslie@scelp.org)
S.C. Environmental Law Project
P.O. Box 1380
Pawleys Island, SC 29585


Janet H. DeBruhl

June 3, 2024

Charleston, South Carolina

**STATE OF SOUTH CAROLINA
COUNTY OF RICHLAND**

)
)
)
)

**AFFIDAVIT OF
DAVID VAUGHAN**

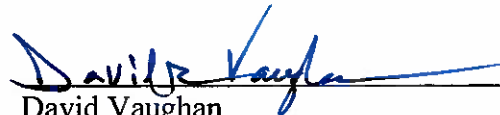
PERSONALLY appeared before me, David Vaughan, who being duly sworn, deposes and says as follows:

1. I have been employed by the South Carolina Department of Environmental Services (“Department”) for over 29 years.
2. I am currently employed as the Division Director of the Onsite Wastewater Program at the Department. My job responsibilities include being responsible for oversight and implementation of the Department’s Onsite Wastewater Program.
3. I am submitting this Affidavit in response to the Honorable Frank R. Addy Jr.’s request to determine whether the Department possesses the resources to electronically post all applications for individual onsite wastewater (“OSWW”) systems servicing an individually deeded dwelling or business that generates less than 1500 gallons per day (“gpd”) of domestic wastewater.
4. Based on my expertise and the information available to me, I affirm that since 2020 the Department has received on average per year over 17,000 applications for septic systems and issued on average per year over 14,500 Permits to Construct individual septic systems. Specifically, in fiscal year 2020-2021, the Department received 17,256 applications for septic systems and issued 14,443 Permits to Construct individual septic systems; in fiscal year 2021-2022, the Department received 18,105 applications for septic systems and issued 14,760 Permits to Construct individual septic systems; in fiscal year 2022-2023, the Department received 16,026 applications for septic systems and issued

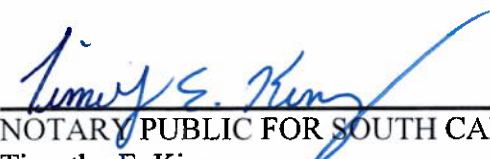
14,511 Permits to Construct individual septic systems; and in fiscal year 2023-2024, the Department received 17,336 applications for septic systems and issued 13,981 Permits to Construct individual septic systems.

5. Given my experience with the Department's Onsite Wastewater Program for the last 23 years, it is my belief and understanding that while electronic public noticing of applications and/or permits issued may not have an immediate effect on Department staff, the staff may be indirectly affected through public requests for information and objectionable appeals filed against the Department's consideration or issuance of a permit.

I declare under penalty of perjury that the foregoing is true and correct.


David Vaughan

Sworn to and subscribed before me
this 20th day of March 2025


NOTARY PUBLIC FOR SOUTH CAROLINA
Timothy E. Kinney

My commission expires: 12/16/2030

Table 1

**State Agency Permits Subject to
Council Review and Certification**

1. Aeronautics Commission	—Certificates of approval for airports and other air traffic facilities.
2. Budget and Control Board	—Permits for activities below the ordinary high water mark which are within the coastal zone but out of the critical areas.
3. Department of Health and Environmental Control	—State permits to construct wastewater treatment systems or septic tanks handling either more than 1500 gallons per day or other than domestic waste. —National Pollutant Discharge Elimination System (NPDES) permits (delegated by EPA). —Section 401 of the Federal Water Pollution Control Act certification. —Construction permits for air emissions. —Water supply permits. —Sanitary Landfill Design, Construction and Operation permits. —Oil and Gas facilities registration certificates.
4. Land Resources Conservation Commission	—Mining operations permits.
5. Public Service Commission	—Certificates for major utility facilities.
6. Water Resources Commission	—Oil and gas facilities permits. —Groundwater capacity use area permits.

CERTIFICATE OF COUNSEL

The undersigned counsel for Appellant certifies that, in accordance with Rule 210(c), SCACR, this **Record on Appeal** contains all material proposed to be included by any party that was presented to the lower court and not any other material. The undersigned also certifies that this **Record on Appeal** complies with the Supreme Court of South Carolina's Revised Order Concerning Personal Identifying Information and Other Sensitive Information in Appellate Court Filings issued April 15, 2014.

RECEIVED
May 04 2026
SC Court of Appeals

s/Leslie S. Lenhardt
Leslie S. Lenhardt, Esq. (S.C. Bar No. 15858)
Amy E. Armstrong, Esq. (S.C. Bar No. 70352)
Monica Whalen, Esq. (S.C. Bar No. 106638)
S.C. ENVIRONMENTAL LAW PROJECT
510 Live Oak Drive
Mount Pleasant, S.C. 29464
Telephone: (843) 527-0078
FAX: (843) 527-0540

Attorneys for Appellant

Charleston, S.C.
May 4, 2026