Environmental Assessment

prepared for the

Stumpy Point Water & Sewer District

Dare County, North Carolina

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Prepared by:
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
919.828.0531
Engineering • Planning • Architecture

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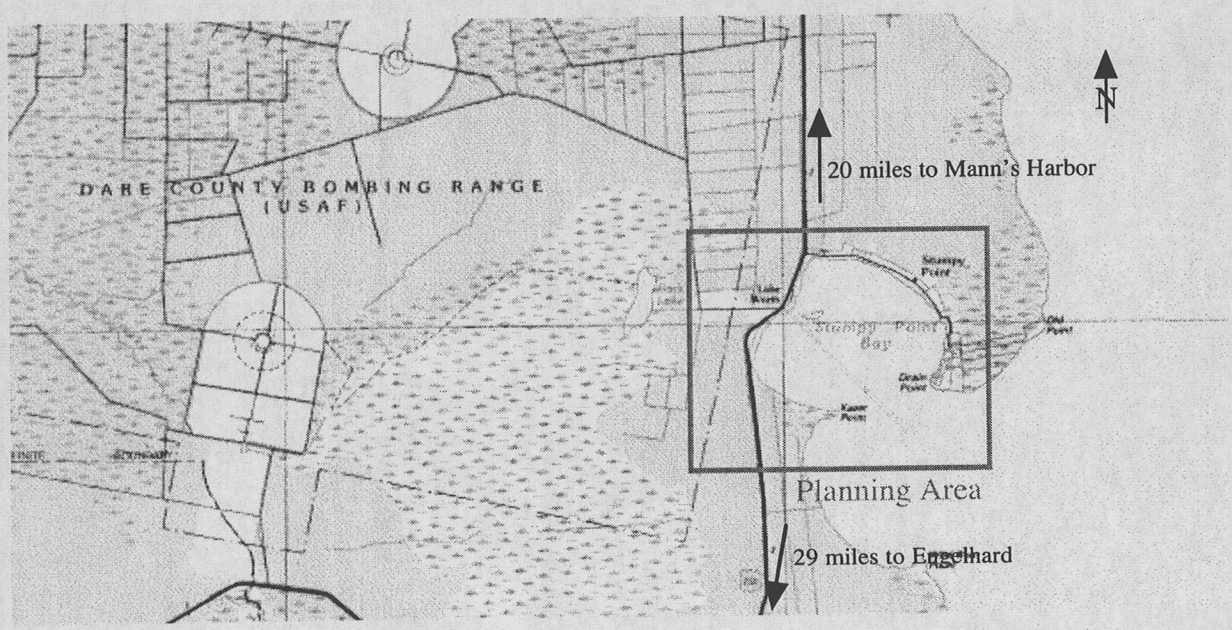
I. Introduction

This Environmental Assessment (EA) has been prepared for the Stumpy Point Water and Sewer District. Stumpy Point is a small, isolated community of 198 persons located on mainland Dare County on the north side of Stumpy Point Bay. The community has potable water service provided by the County through the Stumpy Point Water and Sewer District, but no central wastewater collection and treatment system. Sixty-three (63) of the 110 existing onsite septic systems are known to have straight pipe discharges while another 15 systems or so constructed as to be subject to failure which has resulted in contamination of Stumpy Point Bay and subsequent closure of the bay by the State for use as shellfish harvesting waters.

Location Map of Stumpy Point Planning Area



With funding assistance from the North Carolina Rural Economic Development Center (Rural Center), Dare County commissioned a sewer feasibility study for the Stumpy Point community in June 2003. This document addresses the environmental impacts associated with the recommended alternatives from that study.

The EA is divided into seven (7) sections - Introduction, Existing Environment, Project Need, Alternate Analysis, Environmental Consequences, Mitigative Measures and References. This first section is the Introduction and gives a brief overview of the remainder of the document. The second section, Existing Conditions, discusses the topography, land use, soils, surface waters and groundwaters of the project area. The Project Need section justifies the community's need for a wastewater collection and treatment solution. The fourth section, Alternate Analysis, reviews the types of collection and treatment systems investigated for Stumpy Point and describes the recommended solution. Environmental Consequences expected from construction and operation of

the recommended collection and treatment system are discussed in the fifth section. The sixth section, Mitigative Measures, discusses the actions that will be taken to prevent any permanent, detrimental impacts from the proposed project. References used in the preparation of this document are listed in the seventh section while project comments from Federal and State Agencies are included in the appendix.

II. Existing Environment

Demographics

The community of Stumpy Point is located on mainland Dare County, on the north side of Stumpy Point Bay, approximately 20 miles south of the Mann's Harbor community and 29 miles northeast of the Engelhard community in Hyde County. Stumpy Point Bay opens into the Croatan Sound which separates mainland Dare County from the islands of the Outer Banks. Highway 264 provides the only vehicle access to the community. The land surrounding Stumpy Point belongs to the Alligator River National Wildlife Refuge which is operated by the US Fish and Wildlife Service. Located just west of the study area are two practice bombing ranges operated by the US Air Force and US Navy.

Nearly all residents in Stumpy Point live along Bayview Drive, a 13,500 foot long road that ties into Highway 264 just north of Stumpy Point Bay. Three-quarters of a mile south of the Bayview Drive and Highway 264 intersection is the Lake Worth area. This area includes a barber shop, cabinet shop, Benny's Seafood, NC Forest Service, and one residence, and is included as part of the project study area. According to the Year 2000 census, the population of the area is 198 people. The future population of the area is projected as being 323 people.

Topography

The community of Stumpy Point is situated on the northern edge of Stumpy Point Bay which projects into the Croatan Sound. This is a low-lying, flat area with numerous swamps and peat bogs that surround the community. The two highest points in the study area are both 7 feet MSL. The first point is located at the softball field at the junction of Highway 264 and Bayview Drive, while the other point is located in the Lake Worth sub-area at the junction of Highway 264 and Lake Worth Road. The remainder of the study area ranges in elevation from 2 to 3 feet MSL, with some depressions at sea level. The 100 year maximum wind tide elevation is 6 feet MSL along the waterfront side of Bayview Drive. The wind tide elevation on the north (canal) side of Bayview Drive is 5 feet MSL and the wind tide elevation in the area along Lake Worth is also 5 feet MSL.

The terrain of the areas surrounding Stumpy Point and Lake Worth primarily consists of low-lying swamps and pocosins with dense vegetation. Flooding is frequent and occurs for extended periods of time due to densely-packed muck soils and a high groundwater table. The dominant tree cover is oak, pine, yaupon holly, and redbay while dominant plant varieties include cattails, sawgrass, waxmyrtle, and willow.

Climate

According to the National Climatic Data Center, Dare County is generally hot and humid in

summer, but the coast is cooled by sea breezes. Winter is cool and has brief, occasional cold spells. Rains, often heavy, occur throughout the year, but snowfall is rare. Annual precipitation is adequate for all crops commonly grown.

The average winter temperature is 46° F and the average daily minimum temperature is 35° F. The lowest temperature on record is 6° F and occurred on January 13, 1981. The average summer temperature is 77° F and the average daily maximum temperature is 86° F. The highest temperature on record is 100° F and occurred on July 20, 1977.

Annual precipitation averages 52.6 inches. Fifty-five percent (55%), or about thirty (30) inches, typically falls from April through September. The growing season for most crops also falls in this period. The heaviest 1-day rainfall is 10.7 inches which occurred on September 5, 1979. Thunderstorms occur on about forty-three (43) days per year. Every few years, a tropical storm or hurricane crosses the area which brings 1 to 3 days of intense rainfall. Average seasonal snowfall is approximately two (2) inches and the maximum recorded snowfall is ten (10) inches.

Average humidity for Dare County is nearly sixty-five (65) percent. Humidity is higher at night, and the average humidity at dawn is 80 percent. The sun shines fifty-five (55) percent of the time possible in winter. Prevailing wind is from the southwest and the average windspeed is thirteen (13) miles per hour.

Land Use

Stumpy Point is not currently subject to any land use zoning restrictions. Dare County is working with residents to establish some zoning controls, if the consensus in the community would support such measures. Out of the 110 developed lots, only seven (7) are used for commercial and institutional purposes. These lots include the Stumpy Point Trading Post, Shiloh United Methodist Church, Stumpy Point Volunteer Fire Department, Stumpy Point Community Building, Bayview Chapel, Full Gospel Holiness Church and the Stumpy Point Desalination Water Facility. The remaining 103 developed lots are occupied by residences. Sixty-six (66) lots are undeveloped and of these lots, only nine (9) lots have potential to be developed using traditional onsite wastewater disposal units. These lots are situated on massive sand fills installed decades ago by the US Army Corps of Engineers as a flood protection method.

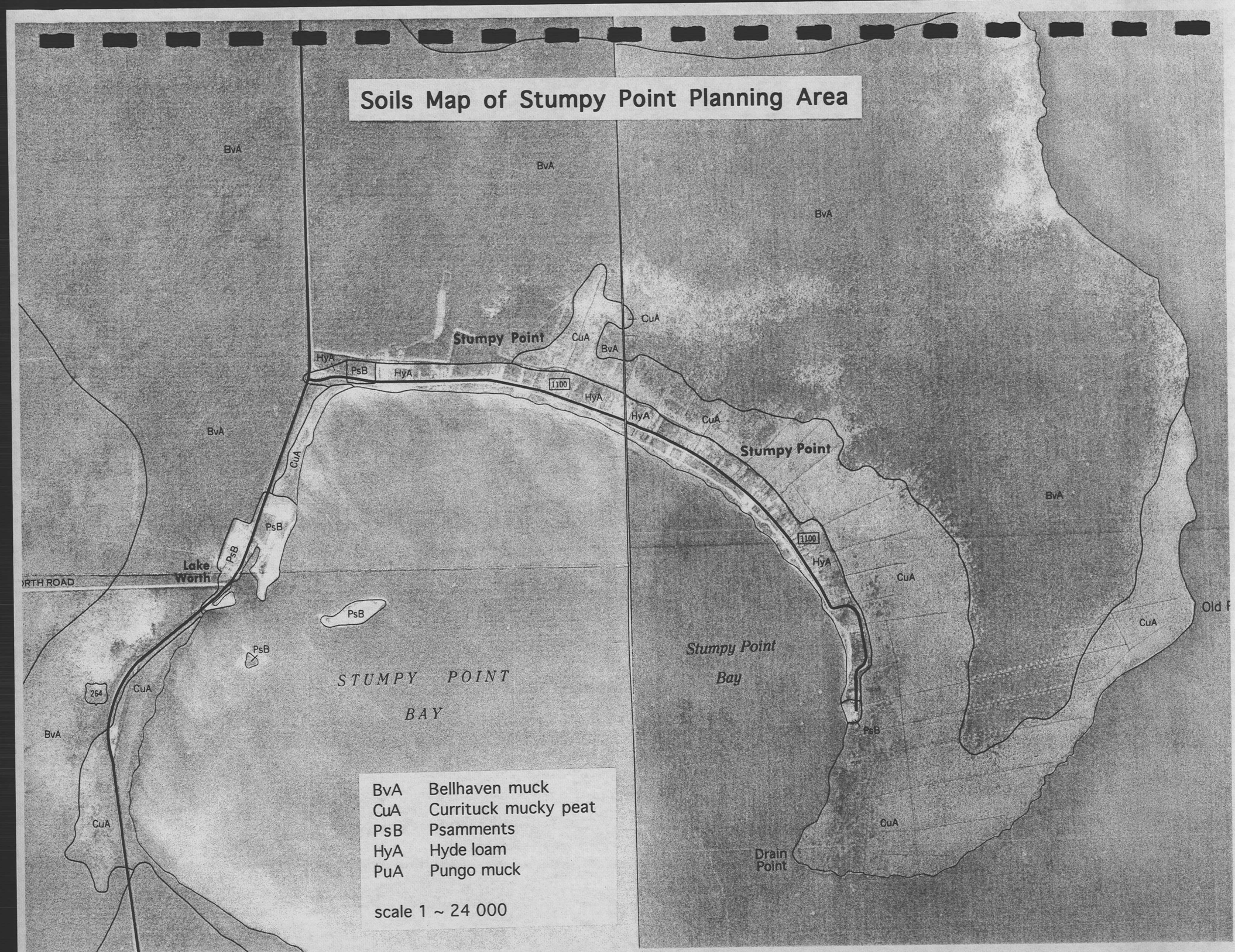
The remaining fifty-seven (57) lots do not meet the minimum groundwater separation requirement of twelve (12) inches required by the NC Division of Environmental Health to install an onsite system and therefore cannot be developed without some form of alternative wastewater treatment and disposal system. Groundwater separation is not the only barrier to onsite treatment. The native soils consist of massive, nearly structureless, and virtually impervious muck that allows little vertical or horizontal movement of water.

The Lake Worth sub-area currently consists of four (4) commercial lots, including Benny's Seafood, Hair by the Bay Hair Salon, Carpenter Shop and NC Forest Service, and one(1) residence. Soils in the Lake Worth area are as limited as those along Bayview Drive.

Soils

Six of the seven soil types in the Stumpy Point area are considered muck soils. Muck soils are nearly level, poorly drained soils typically consisting of dark, well decomposed organic material. Specific muck soils in the study area include Currituck mucky peat, Bellhaven muck, Pungo muck, Roper muck, Hobonny muck, and Ponzer muck. The seventh soil type in the Stumpy Point area is a Hyde loam soil. Loam soils consist of clay, silt, and sand particles, and like muck soils, are nearly level, very poorly drained soils with high organic content and slow permeability characteristics. A typical profile for each soil present in the area is given below.

Soil Type	Typical Profile		Seasonal High Water Table
Currituck Mucky Peat	0-17	Dark brown muck	-1 to +1 ft
	17-40	Very dark brown muck (upper) and black muck (lower)	
	40-60	Black sand (upper) and dark grayish brown sand (lower)	
Bellhaven Muck	0-4	Partially decomposed leaves, twigs and stems	At or near surface
	4-12	Black muck	
	12-38	Black muck (upper) and dark reddish brown muck (lower)	
	38-72	Gray loam	
Pungo Muck	0-2	Partially decomposed needles, leaves and twigs	At or near surface
	2-10	Dark reddish brown muck	
	10-65	Dark reddish brown muck	
	65-72	Gray loam	
Roper Muck	0-13	Black muck	At or near surface
	13-18	Dark grayish brown mucky loam	
	18-34	Dark grayish brown loam	
	34-72	Gray loamy fine sand (upper) and gray loam (lower)	
Hobonny Muck	0-16	Very dark grayish brown muck	At or above surface
	16-72	Very dark grayish brown muck (upper) and dark gray muck (lower)	
Ponzer Muck	0-11	Black muck	At or near surface
	11-24	Very dark brown muck	
	24-72	Dark grayish brown loam (upper) and gray clay loam (lower)	
Hyde Loam	0-13	Black loam (upper) and very dark gray loam (lower)	At or near surface
	13-27	Grayish brown (upper) and dark grayish brown (lower)	
	27-70	Gray fine sandy loam (upper) and light brownish gray loamy fine sand (lower)	


Soils Map of Stumpy Point Planning Area
BvA
CuA
PsB
HyA
PuA
Stumpy Point
Lake Worth
STUMPY POINT BAY
Stumpy Point Bay
Drain Point
1100
264
BvA Bellhaven muck
CuA Currituck mucky peat
PsB Psamments
HyA Hyde loam
PuA Pungo muck
scale 1 ~ 24 000

Geology

Stumpy Point is located on the eastern side of mainland Dare County, which is situated on the Outer Coastal Plain (commonly referred to as the 'tidewater' region) of eastern North Carolina. The Coastal Plain is a wedge of mostly marine sedimentary rocks that gradually thickens to the east and is the largest belt in the State covering 45 percent of the land area. The most common sediment types are sand and clay. The Outer Coastal Plain consists of the immediate coast, including barrier islands, sounds, marshes, lower river systems and associated mainland generally less than 20 feet in elevation.

Fuel-grade peat deposits cover about 677,000 acres in Coastal North Carolina. These deposits formed in the past 10,000 years in swamps or pocosins, Carolina bays and river flood plains. Most of the peat occurs at the surface with no overburden. The peat ranges from 1 to 15 feet thick and averages 4.5 feet thick. Peat has been identified in the swamp and pocosin areas surrounding the Stumpy Point and Lake Worth areas. These areas are all within either the Alligator River National Wildlife Refuge or within military bombing ranges. There is, therefore, little potential for the economic development of the peat deposits.

Surface Waters

Two major surface water bodies are present in the Stumpy Point area - Stumpy Point Bay and Back Lake (also commonly referred to as Lake Worth). Stumpy Point Bay is a large, saltwater body that is designated by the North Carolina Division of Water Quality as Class SA (shellfish), HQW (High Quality Waters). This bay is subject to tidal influences and opens into the Croatan Sound, the body of water separating mainland Dare County from the islands of the Outer Banks. The bay was closed several years ago for use as shellfish harvesting by the Shellfish Sanitation Branch due to fecal coliform bacteria contamination.

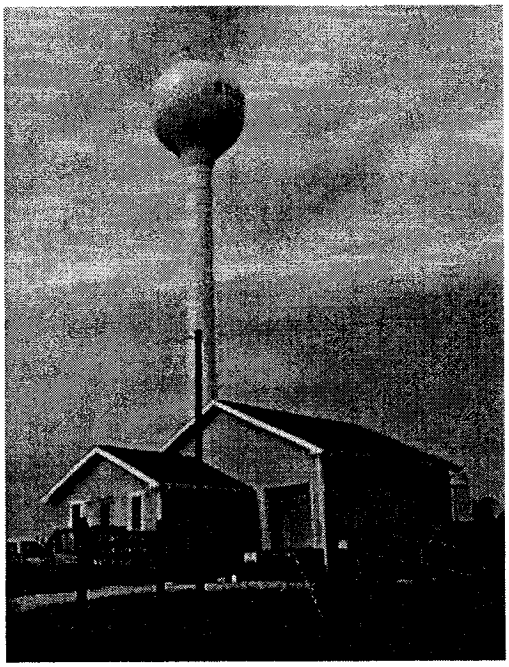
Back Lake is a 110 acre freshwater body located approximately 1.6 miles west of the Lake Worth area. This lake collects water from surrounding wetlands and discharges through a freshwater canal (Lake Worth Canal) that leads to Stumpy Point Bay. The lake is isolated, with limited public access.

Groundwaters

Groundwater is Dare County's main source of water supply. According to the USDA Soil Survey of Dare County, thousands of feet of sediments underlie the County, but only the upper sandy aquifer contains fresh water. The fresh groundwater is generally of good quality, except for excessive hardness and the possibility of excessive iron. On the mainland, salt water is typically at a depth exceeding 200 feet, except near estuaries where the depth to salt water may be 100 feet or less. Limited freshwater well capacity has forced Dare County and the Stumpy Point Water and Sewer District to utilize brackish groundwaters for potable water.

Infrastructure

The Stumpy Point Water and Sewer District operates the Stumpy Point Water Desalination Facility which was put online in December 2002. This facility desalinates brackish groundwater collected from two (2) wells. Each well is equipped with a pump capable of providing groundwater at 70 gallons per minute. Water is treated using the Reverse Osmosis (RO) process and stored in a 75,000 gallon storage tank. The RO reject waste stream is discharged into Stumpy Point Bay through a NPDES permit.



Stumpy Point Water & Sewer District
Desalination Plant & Elevated Tank

Wastewater treatment and disposal is provided by individual onsite septic tank systems and, in a minority of cases, drainfields. Straight pipe discharges are the predominant wastewater disposal method. The Stumpy Point area has no central wastewater collection nor treatment facilities.

Political Jurisdictions

Stumpy Point and Lake Worth lie within the bounds of Croatan Township, also known as the Stumpy Point Tax District, the Stumpy Point Election Precinct and the Stumpy Point Water and Sewer District. The Stumpy Point Election Precinct belongs to Dare County District 1. Dare County lies in North Carolina Congressional District No. 3.

Areas of Archaeological or Historical Value

The North Carolina Office of State Archaeology does not have record of any specific sites of archaeological value in the Stumpy Point and Lake Worth areas. However, this area lies within the 6,000 square mile Carolina Algonkian tribe territory that ranged from the Neuse River northward to the Chesapeake Bay.

No sites in the Stumpy Point vicinity are included on the National Register of Historic Places according to the North Carolina State Historic Preservation Office. The nearest sites include Wynne's Folly near Engelhard in Hyde County and the George Washington Creef House, Fort Raleigh National Historic Site and Theodore S. Meekins House near Manteo in Dare County.

Wildlife and Wildlife Habitats

The Alligator River National Wildlife Refuge borders Stumpy Point on all sides and provides an undisturbed, natural habitat for a number of natural communities, plants and animals. Species

identified in the area known to be of Federal or State concern are listed in the table below. This information was provided by the North Carolina Natural Heritage Program.

Common Name	Genus species	Status
Natural Communities		
Low Pocosin	-	-
Brackish Marsh	-	-
Pond pine Woodland	-	-
Plants		
Cranberry	Vaccinium macrocarpon	Significantly Rare
Spoonflower	Peltandra sagittifolia	Significantly Rare
Northern White Beaksedge	Rhynchuspora alba	Significantly Rare
Animals		
Carolina Watersnake	Nerodia sipedon williamengelsi	Special Concern
Black Bear	Ulssus americanus	Special Concern
Northern Diamondback Terrapin	Malaclemys terrapin terrapin	Special Concern
Manatee	Trichechus manatus	Endangered
Gull-Billed Tern	Sterna nilotica	Threatened
Black Skimmer	Rynchops niger	Special Concern
Black Swamp Snake	Seminatrix pygaea	Special Concern

III. Project Need

Inadequate soils, coupled with a high seasonal groundwater table, have precluded the effective use of septic tank drainfields. A recent survey conducted by the Dare County Health Department revealed that 63 of the 110 developed lots in Stumpy Point have straight pipe discharges to the main canal that parallels Bayview Drive. Another 15 systems are considered to be "non-conforming" systems subject to failure. Straight pipe discharges are considered illegal discharges by the State. The straight pipe discharges and other problem installations are believed to be the source of high numbers of fecal coliform bacteria which has forced the State to close the waters of Stumpy Point Bay for shellfishing purposes. The presence of straight pipes discharging into the canal also creates general public health concerns, particularly with respect to body contact within the waters.

IV. Alternate Analysis

Do Nothing Alternative

The 'Do Nothing' alternative would be to continue to allow sixty-three (63) straight pipe discharges into a canal that leads directly to Stumpy Point Bay, and allow another 15 known problem systems to remain in operation. Not only are straight pipe discharges considered illegal discharges by the State, but fecal coliform contamination would continue to plague the shellfish waters of the bay and not allow them to be reopened by the State for shellfish harvesting. In addition, public health concerns with respect to body contact with the water would not be resolved. The 'Do Nothing' alternative is not an acceptable alternative for Dare County nor the inhabitants of Stumpy Point.

Transportation Alternative

The Town of Manteo has indicated that it does not have the reserve treatment capacity necessary to accept wastewater from Stumpy Point. Even if the Town had adequate capacity, the costs associated with transporting wastewater to Manteo for treatment and disposal are prohibitive. Projected costs for transporting the collected wastewater 26 miles, including a 5 mile directional bore under the Croatan Sound, are in excess of $3.81 million. This estimate does not include the additional materials and labor that would be required by a dredging crew to dredge the Sound at points where tie ins for multiple bore shots would be required.

Transporting wastewater to Engelhard for treatment and disposal has also been eliminated from further consideration. The costs of transporting the wastewater 29 miles would require in excess of $2.45 million (not including collection system costs) assuming Engelhard would be willing to give Stumpy Point a large portion of its treatment capacity. Engelhard has issued no formal response to inquiries concerning the acceptance of wastewater from the Stumpy Point area. The Engelhard system is only permitted to accept 64,000 gallons per day of wastewater, and would therefore be in a poor position to accept Stumpy Point wastewater.

Onsite Treatment and Disposal Alternative

Native soils in Stumpy Point are unsuitable because of extremely low permeabilities and high groundwater levels for onsite systems. A 50 acre area just south of Lake Worth on the east side of Highway 264 has traditionally been used by the US Army Corps of Engineers as a spoils site for the dredging of Stumpy Point Bay. This area was evaluated as a potential wastewater receiving site. After inspecting the site, the Onsite Wastewater Section of the North Carolina Department of Environment and Natural Resources has stated it would not permit the use of

this site for an on-site wastewater treatment and disposal system. The high water retention characteristics of the fine sandy soil, mixed with silt and clay, coupled with the high groundwater conditions at the site would limit the vertical movement of water through the soils, likely resulting in surface failure.

Smaller decentralized systems that could be built in the community have also been eliminated from consideration. Soils mapping indicates the absence of suitable indigenous soils. Hand auger borings made at randomly selected points in the community confirmed the information contained in the Dare County Soil Survey. Some sandy dredged materials were disposed of on the sound side of Bayview Drive to build up the dike years ago, but only nine (9) of these lots are available for development. The available land space would not support the projected wastewater volume nor would concentrating the entire community's wastewater disposal operations directly on the Bay be desirable.

Reuse Alternative

One way in which to eliminate, or partially reduce, a surface water discharge is to adopt reuse practices. Reuse water, also referred to as reclaimed water, can be used for a number of commercial and industrial purposes including golf course and athletic field irrigation, construction dust control and compacting, sewer cleaning, street cleaning, concrete mixing, and certain other manufacturing processes. Reuse water is highly treated, but not accepted as potable water. Benefits from reuse include reduced demands on the potable water supply and reduced effluent discharge to local surface waters. Reuse for the Stumpy Point area is not a viable alternative because of the lack of a reuse customer base. There are no water-intensive commercial or industrial operations in the area. The shallow depth to groundwater (present at depths less than 6 inches for essentially all of the community not built on US Army Corps of Engineer fill area) and the low natural permeability and high water retention capacity of area soils preclude a strong irrigation water demand.

Non-Discharge Alternative

Land application treatment systems are often referred to as "non-discharge" systems because these systems do not directly discharge to surface waters or wetlands. A land application system usually provides secondary wastewater treatment in a large, aerated or facultative lagoon before wastewater is sprayed over sizable acreage of farmland or forests. The required sprayfield size depends on the soil type and vegetative cover. Secondary treatment is followed by treatment from natural bacteria naturally present in the soils as well as by mechanical screening and absorption and adsorption processes that occur as wastewater percolates through the soils. The applied wastewater moves through the sprayfield soils before reaching groundwaters.

Land application via spray irrigation is not suited for the muck-type soils present in the Stumpy Point area. These types of soils, coupled with a high seasonal groundwater table, do not allow for adequate irrigation time during the dry months to dispose of the wastewater stored during the cool season months. No sites are available that would allow the separation between land surface and the groundwater table that the State normally requires. There are provisions in State rules that allow for land application where minimum separation distances from the groundwater table do not exist if predictive calculations demonstrate that there will be no contravention of groundwater standards. Even if predictive calculations demonstrated compliance with the standards, some runoff would occur, due to the high groundwater table being raised to the ground surface at even modest wastewater application rates. Runoff would result in a discharge from a "non-discharge" facility, so a land application system is not an available alternative.

Point Source Discharge Alternatives

Surface discharge systems usually treat wastewater through natural processes, accelerated through the use of mechanical treatment, to provide secondary or tertiary treatment prior to discharging into local surface waters or wetlands. Secondary treatment normally requires 85 percent removal of oxygen demanding waste, removal of solids and disinfection. Tertiary treatment is used when removal rates for conventional pollutants in excess of 85 percent are needed and often also include processes for nutrient removal (nitrogen and phosphorus).

Treated effluent is discharged to free flowing surface waters (stream, river, etc.) or, rarely, to wetlands. A surface water discharge usually consists of a single pipe discharging to receiving waters with a positive 7Q10 flow (the 7Q10 flow is the lowest expected flow to occur for 7 consecutive days in a 10 year period). A wetlands discharge usually requires some type of pipe network to disperse the treated water over a large surface area. Direct wastewater discharges to surface waters classified as shellfish waters (Class SA waters) are generally prohibited by the North Carolina Division of Water Quality regardless of the level of wastewater treatment achieved. Discharge directly to Stumpy Point Bay was therefore not considered for this reason.

The only two options available to Stumpy Point for wastewater disposal are 1) a direct discharge to Lake Worth Canal which drains Back Lake (also referred to as Lake Worth), or 2) a wetlands discharge. Both options are currently under consideration by the NPDES Unit of the NC Division of Water Quality. Tertiary treatment of the wastewater would be provided by the construction of an activated-sludge type treatment plant prior to disposal by either method.

Summary

The 'Do Nothing' alternative will not resolve public health concerns nor eliminate the principle

cause for closed shellfish waters. Transportation to another treatment system is cost prohibitive, and neither Manteo nor Engelhard would agree to accept the wastewater. Decentralized onsite systems and, likewise, conventional land application cannot be used due to soil and groundwater conditions. Reusing treated wastewater is not possible due to a lack of reuse opportunities. The only remaining viable wastewater disposal options for Stumpy Point are tertiary wastewater treatment followed by point source discharge to Lake Worth Canal or a well-dispersed wetlands discharge.

V. Environmental Impacts

Environmental impacts resulting from a project's construction can be broken down into direct and indirect impacts. Direct impacts are experienced during actual construction of the project. Most of these impacts are minimal and temporary, and mitigative measures can usually be taken to significantly reduce their effects on the environment. Indirect impacts usually occur after a project is completed, and are more related to developmental activities that would have not otherwise occurred without the project's implementation. Indirect impacts can be considered as either beneficial impacts or adverse impacts.

Changes in Land Use

Few changes in land use can be expected with the construction of a wastewater collection and treatment system. The collection system will be built on previously disturbed, privately-owned land and in the existing road easements of Bayview Drive and Highway 264. The treatment system will either be built on a previously disturbed dredge spoils area located south of Lake Worth or adjacent to Lake Worth Canal on bombing range property owned by the US Air Force. The treatment plant site is expected to have an actual constructed footprint of less than 0.25 acres and should not alter surrounding land use.

Wetlands and Floodplains

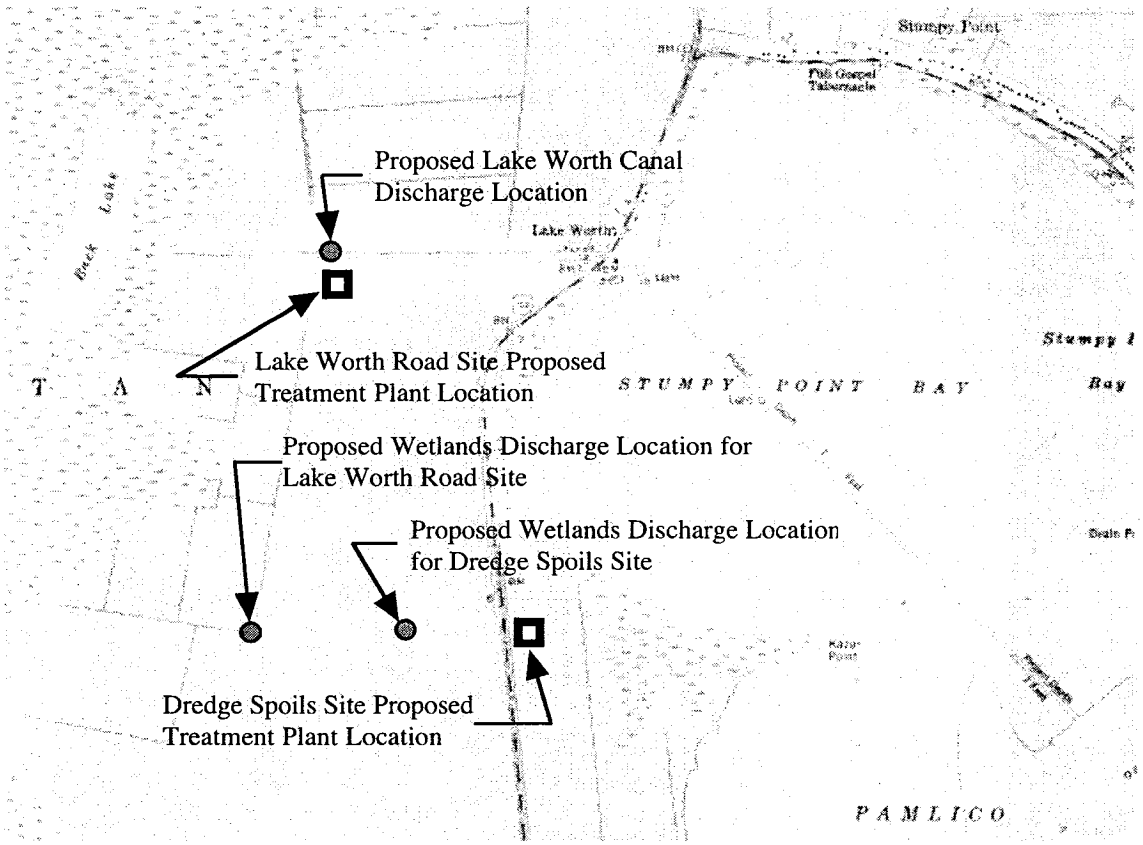
Wetlands, belonging to the Alligator River National Wildlife Refuge, dominate the areas surrounding Stumpy Point and Lake Worth. Wetland disturbance is only anticipated in the event that a wetlands discharge were to be permitted. A wetlands discharge would require a small maintenance easement (200' x 10') to be secured in a natural area to construct an effluent dispersion system consisting of an 18" high crushed stone bed with a perforated pipe. This type of dispersion system would create a thin (estimated as being less than 0.06 inch) laminar flow over a large surface area so as not to disrupt existing vegetation nor create a drinking water source for area wildlife. The discharge is not expected to create an adverse impact on the surrounding wetlands because of the high water quality of the treated water and a relatively large dispersion area.

Two sites are considered for a wetlands discharge depending on the treatment plant location. If the dredge spoils site was selected as the treatment plant location, a wetlands discharge would be proposed approximately 2,400 feet west of the site. Locating the discharge in this area would isolate the flow from road drainage canals.

The other area proposed for a wetlands discharge would be at the south end of an access road that crosses Lake Worth Road, if the Lake Worth Road site was selected for the treatment plant location. The proposed site is 7,000 feet south of the proposed treatment plant and like the other proposed discharge, the site would be isolated from major canals and in a less densely forested

area of the Refuge. The map below identifies the proposed treatment plant and discharge locations.

Location of Proposed Treatment Plant Locations and Proposed Discharge Locations



Prime or Unique Agricultural Lands

Both Hyde loam and Roper muck soils, when properly drained, are considered prime farmland soils in Dare County. The only stretch of Hyde loam soils in the planning area is located along Bayview Drive which has already been residentially developed and therefore is excluded as a prime farmland soil. A 350 acre area of Roper muck soils that straddles Highway 264 begins 1.1 miles south of Lake Worth and extends for 1.25 miles in a southward direction. This property is owned by the US Fish and Wildlife Service. The dredge spoils area, proposed as one of the treatment plant locations, is located on these soils. Since this property is part of the Wildlife Refuge, it is not anticipated that these soils would be cultivated for farming purposes. The proposed project will therefore not interfere with nor result in destruction of prime farmland soils.

Public Lands

The wastewater collection system will be constructed in existing road easements along Bayview Drive and Highway 264. The treatment system would be constructed on land owned by the US Fish and Wildlife Service or land owned by the US Air Force.

Dare County and the US Fish and Wildlife Service have tentatively agreed that any lands acquired from the Wildlife Refuge for this project would be swapped for land owned by Dare County that lies adjacent to, or within, the Wildlife Refuge boundaries. The amount of land swapped would not necessarily be figured on an acre to acre basis, but rather depend on the habitat value of the affected area. The US Air Force has indicated that an easement fee equivalent to the fair market land value would be required if any facilities would need to be constructed on military property.

Two treatment plant sites are under consideration - one site is located on a dredge spoils area owned by the US Fish and Wildlife Service and the other site is located adjacent to Lake Worth Road on land owned by the US Air Force. The proposed 2 acre dredge spoils site is located in the northwest corner of a 70 acre diked area previously utilized by the US Army Corps of Engineers. The site has been previously cleared and is located on the immediate east side of Highway 264 just south of the Lake Worth community. The other proposed treatment site would be located on the south side of Lake Worth Road approximately 5,300 feet west of Highway 264. This location is under consideration by the NC Division of Water Quality for a point source discharge to Lake Worth Canal. A portion (about 0.25 ac) of this site has been previously cleared. This site is more secluded than the dredge spoils site, but is still easily accessible.

Scenic and Recreational Areas

The wastewater collection system would not disturb any scenic or recreational area in the planning area. The treatment system, if constructed at the dredge spoils site, would be positioned in the northwest corner of the site so as not to interfere with wildlife and future dredge operations. If constructed adjacent to Lake Worth Canal, the treatment system would be located on Bombing Range Property operated by the US Air Force, which is not now used for recreational purposes, and has no unique scenic qualities.

The project in general will help improve the water quality of Stumpy Point Bay. The bay is currently closed by the State to shellfish harvesting due to fecal coliform bacteria contamination from failing septic systems. The proposed project would collect, treat, and properly dispose of untreated wastewater that is currently harming bay water quality.

Areas of Archaeological or Historical Value

No areas of archaeological or historical value have been identified in the project area that are on

record with the North Carolina Office of State Archaeology or North Carolina State Historic Preservation Office.

Air Quality

Air quality should not be significantly affected by the proposed project. During construction, heavy machinery may cause minor adverse impacts on the local air quality, but these effects would be temporary and would end with project completion. The wastewater treatment plant would have an emergency backup generator powered by fossil fuels that would be activated during power outages only, but again the negative impacts on air quality would be minimal and of short duration.

Groundwater Quality

Groundwater quality would be improved by the proposed project. The groundwater table in the project area is at or near the surface most of the year. A central collection system would eliminate the straight pipe discharges to the canal that intermingles with the high groundwater table and would also eliminate those few systems that do have drainfields discharging to the groundwater table.

Noise Levels

Noise levels from construction machinery in the planning area would increase temporarily during construction, but levels would return to normal after completion of the project. Noise associated with the operation of the treatment plant facility would be minimal, and isolated, to the immediate vicinity of the plant site.

Water Supplies

The proposed project would have no negative impacts on water supplies. Water supplied by the Stumpy Point Water and Sewer District is collected from two (2) deep groundwater wells and water supply is adequate to handle any projected growth in the planning area. Elimination of onsite systems will minimize the threat posed to the private, individual wells still used by some residents for potable water.

Shellfish or Fish and their Habitats

The proposed project would benefit the local shellfish and fish population in Stumpy Point Bay by eliminating the fecal coliform bacteria contamination caused by failing septic tank systems in the planning area and the stress caused by the ammonia and biochemical oxygen demand within the wastewater streams.

Wildlife and their Habitats

The proposed collection system would not adversely affect wildlife or wildlife habitats since it

will be built within existing road rights-of-way. No threatened or endangered species have been identified in the immediate planning area. All collection system construction would take place in privately-owned residential lots and in existing road easements. The proposed treatment system would be constructed on one of two previously disturbed areas and no wildlife habitats would be disturbed during construction. If a wetlands discharge is permitted, a strip of land approximately 200 feet long by 10 feet wide would be disturbed during construction of a wetland dispersion system. This system would consist of a perforated pipe embedded inside an 18 inch layer of crushed stone. After construction this strip would remain just cleared enough to allow an all terrain vehicle to pass to facilitate inspection and repair of the wetlands discharge dispersion system.

Introduction of Toxic Substances

The proposed project would not introduce any type of toxic substance to the land or waters of the planning area. Wastewater will be treated to reduce the level of biochemical oxygen demand to less than 5 mg/L and the level of ammonia to less than 1 mg/L. Total phosphorus and and total nitrogen levels will generally be less than 2 mg/L and less than 8 mg/L, respectively. Pathogen control will be achieved through 1) the extensive die-off associated with the activated sludge process to be used as the principle treatment system, 2) mechanical removal and adsorption associated with the tertiary filtration process, and 3) ultraviolet (UV) light disinfection. Coliform counts are expected to be consistently removed to less than 14/100 mL and meet State Reuse water levels and the levels required for discharge to high quality waters. Chlorination will not be used to avoid potential toxic effects on aquatic flora.

Eutrophication of Receiving Waters

Eutrophication of the local receiving waters is not expected with construction of the proposed project. The proposed treatment system will reduce the levels of nitrogen and phosphorus that are currently being discharged to local surface waters from failing septic tanks.

VI. Mitigative Measures

Mitigative measures can be taken to help reduce adverse environmental impacts associated with direct construction of the proposed project and with post developmental effects experienced after completion of the project. Brief descriptions of the measures to be taken for this project are given below.

Refuge Lands

Dare County and the US Fish and Wildlife Service have tentatively agreed to swap an equal amount of land (based on habitat value, not acreage size) for any Wildlife Refuge property used by the County for implementation of the proposed treatment system.

Erosion and Sedimentation

An erosion and sedimentation control plan will be made part of the plans and specifications for all wastewater collection and treatment system activities, and this plan will be followed by the project contractor(s) to mitigate the erosion and sedimentation impacts. Any erosion and sedimentation from post project developmental activities will be coordinated with the Dare County Land Use Plan, which has been prepared in accordance with Coastal Area Management Act (CAMA) guidelines to protect estuarine areas.

Water Quality and Air Quality Impacts

Neither heavy commercial nor industrial operations are expected to locate in the planning area, and any effects experienced from light commercial or residential development should be minimal. Water and air quality issues associated with these post project activities will be coordinated with the Dare County Land Use Plan.

Construction Inconvenience

During construction, disruption of traffic and inconvenience to community residents could be minimized by proper planning of construction activities. The noise effect during construction can be minimized by operating equipment during daylight hours and maintaining muffler systems on all the machinery used in construction. Collection system construction will, however, produce some unavoidable inconveniences such as short term road stoppages, and short term loss of driveway access. Installation of new septic tanks as part of the proposed STEP collection system will result in some construction occurring within each resident's yard, and within the yard of each business and institution. STEP effluent pumps will be powered from the existing electrical service of each customer. This will usually require that electricians enter into private homes and business to make the required connections. Undersized electrical services will also have to be replaced as a part of the construction process.

Wastewater Collection and Disposal

Wastewater that is collected from the planning area will be treated to meet State discharge limits for High Quality Waters prior to disposal into the receiving waters or wetlands. A wetlands discharge would be virtually unnoticeable so as not to disrupt aquatic vegetation nor provide a drinking water source for area wildlife. A number of measures will be taken to provide for a high degree of treatment reliability. Dual treatment units will be supplied for all critical treatment components (SBR reactors, tertiary filters, UV disinfection bulb banks, aerobic digester/holding tank blowers) and the treatment plant will be supplied with a standby power generator. All treatment units, including the standby generator, will be located above the 100 year wind tide elevation as a flood protection measure. Septic tank units will be designed with a "storage" pool level above the normal pump off level large enough to accommodate the wastewater expected to be generated during the longest, non disaster related power outage. Pump controls will be designed with a quick connect fitting to allow use of portable generators for pumping power during periods of prolonged power outages such as those that can occur following disasters like hurricanes. A supply of spare septic tank effluent pumps will be maintained by the water and sewer district so that should pump problems develop at any service location, a spare pump can be quickly installed while the defective pump is repaired.

Waste Biosolids Disposal

Waste biosolids will be stabilized to meet EPA Class B standards. Disposal will be by contract with private firms regularly engaged in this practice. Storage equal to six months projected production at design flow will be provided to allow ample time for contract hauling to be arranged, and to allow for a time cushion should unexpected weather or other causes delay schedule disposal operations.

VII. References

The following resources were used in the preparation of this document:

Soil Survey of Dare County, North Carolina
US Department of Agriculture - Soil Conservation Service

North Carolina Natural Heritage Program
Archdale Building
Raleigh, North Carolina

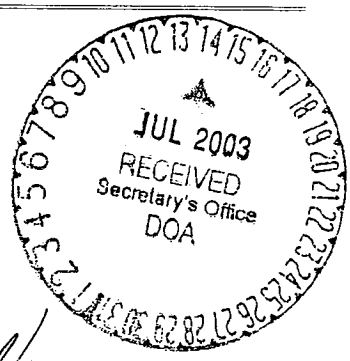
North Carolina Office of State Archaeology
421 North Blount Street
Raleigh, North Carolina

North Carolina State Historic Preservation Office
515 North Blount Street
Raleigh, North Carolina

APPENDIX

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director



MEMORANDUM

TO: Melba McGee, Environmental Coordinator
Office of Legislative and Intergovernmental Affairs
North Carolina Department of Environment and Natural Resources

FROM: David McHenry, Northeast Coastal Region Coordinator
Habitat Conservation Section

DATE: June 25, 2003

SUBJECT: Scoping comments on wastewater project for Stumpy Point, Dare County, North Carolina.
OLIA No. 03-0375

This memorandum responds to a request from the Dare County Health Department for our concerns regarding the effects of a central wastewater system for the Town of Stumpy Point on fish and wildlife resources. Our comments are provided in accordance with certain provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

A large proportion of homes in the Town of Stumpy Point currently discharge domestic sewage through straight pipe outfalls, which collectively present a health threat to the local population and cause chronic bacterial contamination of local waters. An Engineering Report and Environmental Assessment (EA) will evaluate construction of a central wastewater system that would involve wastewater reuse, connection to an existing system or waste disposal via surface water or land application. Either surface water or a land disposal alternative will likely be pursued for this project despite restrictions on discharges of treated wastes to SA classified waters and the limited availability of suitable soils for land application in the Stumpy Point area.

The Commission supports the efforts to eliminate the health concerns and contamination associated with the current straight piping of domestic waste in Stumpy Point. We encourage a full evaluation of practicable alternatives to identify a solution to the problem that also minimizes impacts to fish and wildlife resources in the region. To provide a thorough review of proposed project impacts on fish and wildlife resources, we request that consultants, project sponsors, or permit applicants provide the following information in the environmental documents:

1. Include descriptions of fish and wildlife resources within the project area, and a listing of federally or state designated threatened, endangered, or special concern species. When practicable, potential borrow areas to be used for project construction should be included in the inventories. A listing of designated species can be developed by consulting information from:

   The Natural Heritage Program

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 733-3633 ext. 281 • Fax: (919) 715-7643

N. C. Division of Parks and Recreation
www.ncsparks.net/nhp/search.html

2. Surveys should be conducted by biologists with both state and federal endangered species permits.

3. Include descriptions of any streams or wetlands affected by the project.

4. Include project maps identifying wetland areas. Identification of wetlands may be accomplished through coordination with the U.S. Army Corps of Engineers (COE). If the COE is not consulted, the person delineating wetlands should be identified and their credentials listed.

5. Provide information on existing, planned, and projected sewer and water infrastructure service throughout the service area. A map showing the location of the existing and projected lines and areas containing special resources should be included.

6. Define the service area for the project, including any ETJs (extra-territorial jurisdiction), and provide a map of the service area. The map and description should provide the NCDWQ designated 14 digit hydrologic unit codes (HUC) included in the service area.

7. Provide a description of project activities that will occur within wetlands, such as fill or channel alteration. Acreage of wetlands impacted by alternative project designs should be listed.

8. Provide a description and a cover type map showing acreage of upland wildlife habitat impacted by the project.

9. Discuss the extent to which the project will result in loss, degradation or fragmentation of wildlife habitat (wetlands and uplands).

10. Discuss any measures proposed to avoid or reduce impacts of the project or to mitigate unavoidable habitat losses.

11. Discuss the cumulative impacts of secondary development facilitated by the proposed project. Such discussion should weigh the economic benefits of such growth against the costs of associated environmental degradation.

    (a) Include specific measures that will be used to address stormwater at the source. Include specific requirements for both residential and industrial developments and Best Management Practices (BMPs) that will be required.

    (b) Include specific measures that will be used to protect stream corridors, riparian habitat, and a minimum of the 100-year floodplain from filling and development. Commitments by the project sponsors to protect area streams with riparian buffers through purchase or conservation easement are of particular interest

12. Include a list of document preparers that shows each individual's professional background and qualifications.

Thank you for the opportunity to provide input in the early planning stages of this project. We look forward to reviewing the preceding information and other details of project alternatives as they are developed further. At that time we may have some specific concerns and recommendations regarding impacts of the project on fish and wildlife resources. If we can further assist your office in the interim, please contact me at (252) 946-6481 extension 345.

NCDENR
North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

2 July 2003

MEMORANDUM

TO: Melba McGee, Environmental Coordinator
Office of Legislative and Intergovernmental Affairs

FROM: Harry LeGrand, Zoologist HL
NC Natural Heritage Program

SUBJECT: Scoping: Stumpy Point Wastewater Study; Dare County

REFERENCE: 03-0375

The Natural Heritage Program has several records of rare species in the general vicinity of Stumpy Point. However, all contain some vague information regarding specific locations. Two rare animals known from the area presumably inhabit tidal marshes in the vicinity of Stumpy Point, such as those lying just to the southeast of the community. These animals are the northern diamondback terrapin (*Malaclemys terrapin terrapin*), which is a Federal Species of Concern and State Special Concern; and the Carolina water snake (*Nerodia sipedon williamengelsi*), which is State Special Concern and an endemic taxon to North Carolina. There is also an old record of the spoonflower (*Peltandra sagittifolia*), considered Significantly Rare in the state, "in water of small ditch of savannah near Stumpy Point", but with no date available. The Federally Endangered West Indian manatee (*Trichechus manatus*) has been recorded from Stumpy Point Bay, but this is a vagrant or very rare migrant to the state and is not a resident in Dare County waters. A small island in the western end of Stumpy Point Bay has been used by various terns and black skimmers (*Rynchops niger*) in past years, but the site was not active during the last statewide survey in 2001.

Despite the general vagueness of locality and date information of the above records, it is important that the tidal marshes and estuary system at Stumpy Point and Stumpy Point Bay not be impacted by effluent/runoff from spray irrigation or other sewage disposal methods.

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR

DIVISION OF WATER QUALITY

July 2, 2003

MEMORANDUM

To: Melba McGee, Environmental Coordinator
Office of legislative & Intergovernmental Affairs

From: Al Hodge, Environmental Engineer
Washington Regional Office

Subject: **Project Number # 03-0375**
Scoping Comment Request
Stumpy Point Wastewater Study
Dare County

I have met with Ford Chambliss of the Wooten Company, David Goodrich of the WQ NPDES Permitting Unit, Kim Colson of the WQ Non-Discharge Permitting Unit, David Goodrich of the GW Permitting Group, and the Dare County Health Department on this issue. The points of interest raised, which are to be addressed by this Preliminary Engineering Report & Environmental Assessment, are;

- Preliminary permission form the US Fish and Wildlife Service-Alligator River National Wildlife Refuge management must be obtained for the use of any land under their management.
- Because of the existing environmental conditions; very high seasonal high water table, no known land available for a surface spray irrigation non-discharge system, and no surface waters other than SA & zero flow streams available for discharges, a variance must be obtained for any proposed option. Therefore, all wastewater treatment options must be explored by the Wooten Company including permitting options by the On-Site Sewage Section of the Division of Environmental Health.
- The wastewater study must include the feasibility of the Stumpy Point Community being financially capable of operating and maintaining the chosen option. If the study shows that the Stumpy Point Community is not capable of funding the long term operation and maintenance of the chosen alternative then any secondary funding source must be addressed and a letter of commitment from the secondary source should be included.

State of North Carolina
NCDENR Department of Environment and Natural Resources

Reviewing Office: _____
Project Number: 03-0375 Due Date: ____/____/____

INTERGOVERNMENTAL REVIEW - PROJECT COMMENTS

After review of this project it has been determined that the DENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of this form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (Statutory Time Limit)
☐	Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
☐	NPDES-permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection preapplication conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90 - 120 days (N/A)
☐	Water Use Permit	Preapplication technical conference usually necessary	30 days (N/A)
☐	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
☐	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Preapplication conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
☐	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100, 2Q.0300, 2H.0600)	N/A	60 days
☒	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
☒	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 2D.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-733-0820.		
☐	Complex Source Permit required under 15 A NCAC 2D.0800		
☒	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Section) at least 30 days before beginning activity. A fee of $40 for the first acre or any part of an acre. $50		20 days (30 days)
☐	The Sedimentation Pollution Control Act of 1973 must be addressed with respect to the referenced Local Ordinance.		30 days
☐	Mining Permit	On-site inspection usual. Surety bond filed with DENR. Bond amount varies with type mine and number of acres of affected land. Any are mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
☐	North Carolina Burning permit	On-site inspection by N.C. Division of Forest Resources if permit exceeds 4 days	1 day (N/A)
☐	Special Ground Clearance Burning Permit-22 counties in coastal N.C., with organic soils.	On-site inspection by N.C. Division of Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
☐	Oil Refining Facilities	N/A	90 - 120 days (N/A)
☐	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to DENR approved plans. May also require permit under mosquito control program, and a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of $200.00 must accompany the application. An additional processing fee based on a percentage of the total project cost will be required upon completion.	30 days (60 days)

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (Statutory Time Limit)
☐	Permit to drill exploratory oil or gas well	File surety bond of $5,000 with DENR running to State of N.C. conditional that any well opened by drill operator shall, upon abandonment, be plugged according to DENR rules and regulations.	10 days (N/A)
☐	Geophysical Exploration Permit	Application filed with DENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days (N/A)
☐	State Lakes Construction Permit	Application fees based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15 - 20 days (N/A)
☐	401 Water Quality Certification	N/A	55 days (130 days)
☐	CAMA Permit for MAJOR development	$250.00 fee must accompany application	60 days (130 days)
☐	CAMA Permit for MINOR development	$50.00 fee must accompany application	22 days (25 days)
☐	Several geodetic monuments are located in or near the project area. If any monument needs to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687 Raleigh, N.C. 27611		
☐	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
☐	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
☐	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
*	Other comments (attach additional pages as necessary, being certain to cite comment authority)		

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

☐ **Asheville Regional Office**
59 Woodfin Place
Asheville, N.C. 28801
(828) 251-6208

☐ **Mooresville Regional Office**
919 North Main Street
Mooresville, N.C. 28115
(704) 663-1699

☐ **Wilmington Regional Office**
127 Cardinal Drive Extension
Wilmington, N.C. 28405
(910) 395-3900

☐ **Fayetteville Regional Office**
225 Green Street, Suite 714
Fayetteville, N.C. 28301
(910) 486-1541

☐ **Raleigh Regional Office**
3800 Barrett Drive, P.O. Box 27687
Raleigh, N.C. 27611
(919) 571-4700

☐ **Winston-Salem Regional Office**
585 Waughtown Street
Winston-Salem, N.C. 27107
(336) 771-4600

☒ **Washington Regional Office**
943 Washington Square Mall
Washington, N.C. 27889
(252) 946-6481

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Coastal Management

Michael F. Easley, Governor | Donna D. Moffitt, Director | William G. Ross Jr., Secretary

MEMORANDUM

TO: Melba McGee, N.C. Division of Policy and Development
FROM: Guy Pearce, N.C. Division of Coastal Management GP
SUBJECT: Review of SCH # 03-0375 Date: 7/21/2003

___ A COPY OF ALL COMMENTS RECEIVED BY THE SCH IS REQUESTED

_✓_ REVIEWER COMMENTS ATTACHED

Review Comments:

___ This document is being reviewed for consistency with the N.C. Coastal Management Program pursuant to federal law and/or N.C. Executive Order 15. Agency comments received by SCH are needed to develop the State's consistency position

- Project Review Number (if different from above) _____.
- A consistency position will be developed based upon our review on or before _____.

___ A Consistency Determination document _____ is, or _____ may be required for this project pursuant to federal law and/or N.C. Executive Order 15. Applicant should contact Guy Pearce or Doug Huggett in Raleigh at (919) 733-2293 for information on proper document format and applicable state guidelines and land use plan policies.

___ Proposal is in draft form, a consistency response is inappropriate at this time. A Consistency Determination should be included in the final document.

___ A Consistency Determination Document (pursuant to federal law and/or N.C. Executive Order 15) is not required.

_____ A consistency response has already been issued. Project Number _____ Date Issued _____

_____ Proposal involves < 20 acres and/or a structure < 60,000 sq. ft. and no AEC's or Land use Plan problems.

_____ Proposal is not in the Coastal Area and will have no significant impacts on any land or water use or natural resources of the Coastal Area.

_✓_ A CAMA Permit _____ is, or _✓_ may be required for all or part of this project. Applicant should contact Ted Sampson in Elizabeth City phone # 252/264-3901 for information.

___ A CAMA Permit _____ has already been issued or _____ is currently being reviewed under separate circulation. Permit Number _____ Date Issued _____

___ Other (see attached).

State of North Carolina Consistency Position:

___ The proposal is consistent with the N.C. Coastal Management Program provided that all conditions are adhered to and that all state authorization and/or permit requirements are met prior to implementation of the project.

___ The proposal is inconsistent with the N.C. Coastal Management Program.

___ Other (see attached).

1638 Mail Service Center, Raleigh, North Carolina 27699-1638
Phone: 919-733-2293 \ FAX: 919-733-1495 \ Internet: http://dcm2.enr.state.nc.us

RECEIVED

JUN 2 0 2003

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH

Project Number
03-0375
County
Dare

Inter-Agency Project Review Response

Project Name Stumpy Point Water & Sewer Dist. Type of Project Preliminary Eng. Report; EA

Comments provided by:

- ☐ Regional Program Person
- ☒ Regional Engineer for Public Water Supply Section
- ☐ Central Office program person

Name: Michael Bell Date: 6/25/03

Telephone number: (252) 946-6481

Program within Division of Environmental Health:

- ☒ Public Water Supply
- ☐ Other, Name of Program: _____

Response (check all applicable):

- ☑ No objection to project as proposed
- ☐ No comment
- ☐ Insufficient information to complete review

STUMPY POINT IS SERVED BY A PUBLIC COMMUNITY WATER SUPPLY SYSTEM.

Return to:

Public Water Supply Section
Environmental Review Coordinator
for the
Division of Environmental Health

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Marine Fisheries

Michael F. Easley, Governor
William G. Ross, Jr., Secretary

Preston P. Pate, Jr., Director

MEMORANDUM:

TO: Melba McGee, Office of Legislative and Intergovernmental Affairs, Environmental Coordinator

THROUGH: Mike Street, NC Division of Marine Fisheries, Chief Habitat Protection Section
Sara E. Winslow, NC Division of Marine Fisheries, Northern District Manager

FROM: Lynn T. Henry, NC Division of Marine Fisheries, Marine Biologist

DATE: August 6, 2003

SUBJECT: Stumpy Point Wastewater Study, Dare County, Scoping Comments Request, Project # 03-0375

The following comments by the North Carolina Division of Marine Fisheries (NCDMF) on the subject permit are offered pursuant to G.S. 113-131. Depending on the selected course of action, the proposed project may degrade the receiving waters, affecting existing uses. Such degradation would be a violation of the federal Clean Water Act, as well as applicable state laws, rules, and policies. These comments are pursuant to NCDMF's objective to reduce pollution and improve conditions in the currently impacted areas of Stumpy Point Bay that are prohibited (closed) for shellfish harvest.

The NCDMF hopes that any actions relative to this domestic wastewater treatment problem will not further degrade the aquatic habitat and use of the available shellfish resources in the Stumpy Point Bay area. The "scoping" document states, "State policy does not normally allow for any permitted discharge of treated municipal wastewater into such (SA) waters". The NCDMF is concerned that a sewage treatment plant with a discharge into the surface waters of Stumpy Point Bay would result in a situation similar to that which exists in Shallowbag Bay near Manteo. Shallowbag Bay is currently prohibited (closed) for shellfish harvesting. In 1990, the N.C. Division of Water Quality, based on a request from the Town of Manteo stated that a reclassification from Class SC to SA waters was not possible due to the existing wastewater treatment plant discharge into the bay (NCDENR 2002).

Stumpy Point Bay is classified as SA, HQW waters. (Please see Attachment 1 for the TIDAL SALT WATER QUALITY STANDARDS FOR CLASS SA WATERS.) All SA waters have a supplemental classification of HQW (High Quality Waters) and are considered to have water quality higher than North Carolina's standards for such waters. The majority of the area is approved for commercial shellfish harvest, and most waters in the area are fully supporting designated uses. Two areas (Lake Worth in the northwest and Drain Point in the southeast) within the bay are currently prohibited (closed) for shellfish harvest. The problem parameter is fecal coliform bacteria contamination. Potential sources of pollution include straight pipes, wildlife, and nonpoint runoff (NCDENR 2002). Attachment 1 further describes quality standards applicable to Class SA Waters and prescribed treatment for wastewater discharged to High Quality Waters (HQW).

Survey data from NCDMF indicate that Stumpy Point Bay and adjacent waters are important habitat for many estuarine-dependent species. The NCDMF has been extremely active with shellfish/habitat enhancement projects (shell-planting) in the Stumpy Point Bay area.

3441 Arendell St., P.O. Box 769, Morehead City, North Carolina 28557
Phone: 252-726-7021 \ FAX: 252-727-5127 \ Internet: www.ncdmf.net

Table 1 indicates the material type, amount, and area coverage for each site. These shell-planting sites provide a substrate for the attachment of larval oysters and habitat (foraging and protection) for many other aquatic species, such as blue crabs and red drum.

Land application, constructed wetlands, sub-surface, and conventional treatment should all be evaluated before a final wastewater treatment system is chosen. An innovative combination of these various systems would be likely to provide the best treatment, and therefore protect water quality.

Suitable sites within the adjacent Alligator River National Wildlife Refuge and U. S. Air Force properties should be considered for land application, wetland, or sub-surface treatment. A cooperative venture between Dare County and the federal agencies could yield long-term benefits for North Carolina's natural resources and users.

Wetland and stream crossing impacts resulting from construction of the main facility and sewer lines should be considered and presented as an integral part of the options evaluated and proposed. Horizontal directional boring is the preferred method for crossing wetlands and streams.

Design capacity should allow for population growth, excessive infiltration, and severe weather events. Sludge volume, handling, and disposal should be addressed in the proposal. The applicant should present a proposal for a comprehensive record-keeping system to document operational, inspection, and maintenance activities that may affect water quality for estuarine organisms and human use of the waters of Stumpy Point Bay.

The NCDMF is concerned that the proposed effort will not achieve the desired results unless Dare County officials inspect and require system use by all structures with marginal or failing septic systems. A commitment by Dare County officials to require use and the willingness of Stumpy Point residents to utilize the system should be addressed in the report/assessment.

Due to the low-lying nature of the area and sensitive nature of the adjacent waters, extra precautions must be inherent in the siting and operation of the proposed facility. The inability to properly hold and treat wastes is likely if the system is not designed to handle extreme weather events. The NCDMF recommends that the permit applicant be required to develop an Environmental Impact Statement, given the potential closure of these SA waters to shellfish harvest due to accidental spills, overflows, excess volume, or inundation from flooding (wind tides and excessive rainfall). The document should also evaluate the probable effects of sea level rise during the expected life of the proposed system.

The potential for flooding should be a major consideration in the siting, operation and maintenance of the facility and infrastructure. Worst-case weather related scenarios should be incorporated in the plans for this facility. The main hazards associated with tropical cyclones (especially hurricanes) are storm surge, high winds and tornadoes, heavy rain, and flooding. Along the coast, storm surge is the greatest threat to life and property (http://hurricanes.noaa.gov/prepare/title_hazards.htm.). North Carolina Storm Surge Maps predict that the entire Dare County mainland may be inundated by floodwaters (not rainfall) during Category 1 (minimal) and 2 hurricanes (http://www.ncstormsurge.com/comaps.html.). Estimated flood height would be even greater with the stronger Category 3-5 hurricanes. Hurricanes (and some tropical storms) typically produce widespread rainfall of 6 to 12 inches or more, often resulting in severe flooding (http://hurricanes.noaa.gov/prepare/summary_hazards.htm.). Localized rainfall may be much greater.

Tertiary wastewater treatment with nitrogen removal should be required, if a surface water discharge is allowed by DWQ. A discharge point into Pamlico Sound outside the Stumpy Point Bay area would be preferred to facilitate mixing. Alternatives to chlorine disinfection should be evaluated. If chlorine disinfection is utilized, provisions should be made for chlorine stripping prior to discharge because chlorine is toxic to larvae of many estuarine species.

Literature Cited

NCDENR (North Carolina Department of Environment and Natural Resources). 2002. Pasquotank River Basinwide Water Quality Plan, July 2002, Division of Water Quality, Raleigh, NC. 150p + Appendices.

Table 1. Stumpy Point Shell Planting 1994-2000

Year	Site #	Bushels	Cultch Material
1984	406-84	9,000	surf clam
1985	411-85	13,500	oyster/surf clam
1986	452-86	8,000	surf clam
1987	499-87	4,500	surf clam
1988	543-88	4,500	surf clam
1989	594-89	9,000	oyster/surf clam
1991	699-91	4,500	surf clam
1993	812-93	9,000	calico scallops
1994	920-94	9,200	surf clam
1995	000-95	19,500	surf clam
	D10-95	1,300	surf clam
1997	132-97	9,800	surf clam
	134-97	6,000	oyster
1998	140-98	9,000	oyster
1999	163-99	20,400	surf clam
2000	215-00	12,000	surf clam

Attachment 1

ENR-ENVIRONMENTAL MANAGEMENT T15A: 02B .0200

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15A NCAC 02B .0221 TIDAL SALT WATER QUALITY STANDARDS FOR CLASS SA WATERS

The following water quality standards apply to surface waters that are used for shellfishing for market purposes and are classified SA. Water quality standards applicable to Class SC waters as described in Rule .0220 of this Section also apply to Class SA waters.

(1) Best Usage of Waters. Shellfishing for market purposes and any other usage specified by the "SB" or "SC" classification;

(2) Conditions Related to Best Usage. Waters shall meet the current sanitary and bacteriological standards as adopted by the Commission for Health Services and shall be suitable for shellfish culture; any source of water pollution which precludes any of these uses, including their functioning as PNAs, on either a short-term or a long-term basis shall be considered to be violating a water quality standard;

(3) Quality Standards applicable to Class SA Waters:

(a) Floating solids; settleable solids; sludge deposits: none attributable to sewage, industrial wastes or other wastes;

(b) Sewage: none;

(c) Industrial wastes, or other wastes: none which are not effectively treated to the satisfaction of the Commission in accordance with the requirements of the Division of Health Services;

(d) Organisms of coliform group: fecal coliform group not to exceed a median MF of 14/100 ml and not more than 10 percent of the samples shall exceed an MF count of 43/100 ml in those areas most probably exposed to fecal contamination during the most unfavorable hydrographic and pollution conditions.

History Note: Authority G.S. 143-214.1; 143-215.3(a)(1);
Eff. October 1. 1995.

15A NCAC 02B .0224 HIGH QUALITY WATERS

High Quality Waters (HQW) are a subset of waters with quality higher than the standards and are as described by 15A NCAC
2B .0101(e)(5). The following procedures shall be implemented in order to implement the requirements of Rule .0201(d) of this Section.

(1) New or expanded wastewater discharges in High Quality Waters shall comply with the following:

(a) Discharges from new single family residences shall be prohibited. Those existing subsurface systems for single family residences which fail and must discharge shall install a septic tank, dual or recirculating sand filters, disinfection and step aeration.

(b) All new NPDES wastewater discharges (except single family residences) shall be required to provide the treatment described below:

(i) Oxygen Consuming Wastes: Effluent limitations shall be as follows: $BOD5$= 5 mg/l, $NH3$-N = 2 mg/l and DO = 6 mg/l. More stringent limitations shall be set, if necessary, to ensure that the cumulative pollutant discharge of oxygen-consuming wastes shall not cause the DO of the receiving water to drop more than 0.5 mg/l below background levels, and in no case below the standard. Where background information is not readily available, evaluations shall assume a percent saturation determined by staff to be generally applicable to that hydroenvironment.

(ii) Total Suspended Solids: Discharges of total suspended solids (TSS) shall be limited to effluent concentrations of 10 mg/l for trout waters and PNA's, and to 20 mg/l for all other High Quality Waters.

(iii) Disinfection: Alternative methods to chlorination shall be required for discharges to trout streams, except that single family residences may use chlorination if other options are not economically feasible. Domestic discharges are prohibited to SA waters.

(iv) Emergency Requirements: Failsafe treatment designs shall be employed, including stand-by power capability for entire treatment works, dual train design for all treatment components, or equivalent failsafe treatment designs.

Attachment 1 (continued)

(v) Volume: The total volume of treated wastewater for all discharges combined shall not exceed 50 percent of the total instream flow under 7Q10 conditions.
(vi) Nutrients: Where nutrient overenrichment is projected to be a concern, appropriate effluent limitations shall be set for phosphorus or nitrogen, or both.
(vii) Toxic substances: In cases where complex wastes (those containing or potentially containing toxicants) may be present in a discharge, a safety factor shall be applied to any chemical or whole effluent toxicity allocation. The limit for a specific chemical constituent shall be allocated at one-half of the normal standard at design conditions. Whole effluent toxicity shall be allocated to protect for chronic toxicity at an effluent concentration equal to twice that which is acceptable under design conditions. In all instances there may be no acute toxicity in an effluent concentration of 90 percent. Ammonia toxicity shall be evaluated according to EPA guidelines promulgated in "Ambient Water Quality Criteria for Ammonia - 1984"; EPA document number 440/5-85-001; NITS number PB85-227114; July 29, 1985 (50 FR 30784) or "Ambient Water Quality Criteria for Ammonia (Saltwater) - 1989"; EPA document number 440/5-88-004; NTIS number PB89-169825. This material related to ammonia toxicity is hereby incorporated by reference including any subsequent amendments and editions and is available for inspection at the Department of Environment and Natural Resources Library, 512 North Salisbury Street, Raleigh, North Carolina. Copies may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 at a cost of forty-seven dollars ($47.00).
(c) All expanded NPDES wastewater discharges in High Quality Waters shall be required to provide the treatment described in Sub-Item (1)(b) of this Rule, except for those existing discharges which expand with no increase in permitted pollutant loading.
(2) Development activities which require an Erosion and Sedimentation Control Plan in accordance with rules established by the NC Sedimentation Control Commission or local erosion and sedimentation control program approved in accordance with 15A NCAC 4B .0218, and which drain to and are within one mile of High Quality Waters (HQW) shall be required to follow the stormwater management rules as specified in 15A NCAC 2H .1000. Stormwater management requirements specific to HQW are described in 15A NCAC 2H .1006.
(3) Listing of Waters Classified HQW with Specific Actions. Waters classified as HQW with specific actions to protect exceptional water quality are listed as follows: Thorpe Reservoir [Little Tennessee River Basin, Index No. 2-79-23-(1)] including all of its tributaries shall be managed with respect to wastewater discharges through Item (1) of this Rule. Item (2) of this Rule shall not be applied in association with this HQW because of the local government implementation of WS-III stormwater management requirements.
If an applicant objects to the requirements to protect high quality waters and believes degradation is necessary to accommodate important social and economic development, the applicant may contest these requirements according to the provisions of G.S. 143-215.1(e) and 150B-23.
History Note: Authority G.S. 143-214.1; 143-215.1; 143-215.3(a)(1);
Eff. October 1, 1995;
Amended Eff. August 1, 1998; April 1, 1996.

State of North Carolina
Department of Environment and
Natural Resources
Washington Regional Office

Michael F. Easley, Jr., Governor
William G. Ross, Secretary

NCDENR
NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

August 8, 2003

Fred Parker, RS
Dare County Environmental Health Dept.

Kitty Hawk, NC

RE: Stumpy Point

Dear Fred,

I visited a proposed site for a cluster disposal field, which is intended to serve the community of Stumpy Point, with you on July 29, 2003. We met Shankar Mistry, PE from Wooten Company, at the site.

The site is located on Highway 264, and is comprised of a rectangular dike into which dredge spoil from nearby channel clearing has been pumped. Most of the area within the dike is continuously ponded with water, except for the extreme northern portion. I performed a series of four borings in the spoil, which was not inundated by water. The borings were done at a distance of 200 feet from the water, and were equally spaced at 100-foot intervals. The borings had the following characteristics:

1.) The texture was fine sand from 0 to 50 inches. A layer of silty clay and muck was found between 50 and 54 inches.
2.) Redoximorphic features called oxidized rizospheres were present within 18 inches of the present day spoil surface. These features indicated saturation and reduction occur for an extended period of time within 18 inches of the spoil surface.
3.) The spoil was extremely dense at a depth of about 30 inches. This indicated to me that a closed packed arrangement has developed in the fine sand, which would have very low permeability.
4.) The observed water level in the borings rose to within 24 inches of the spoil surface. The true elevation of the water level in the borings appeared to coincide with the surface of the adjacent pond. The water level will not vary from what was observed because it is controlled by the water level in the ponded area.

The site would be unsuitable for the proposed ground absorption system proposed for Stumpy Point for the following reasons:

1.) The water level rises to within 18 inches of the spoil surface. With the proposed addition of 50,000 gallons of sewage, the water would likely mound over the top of the ground surface given the observed characteristics in the borings.

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2.) The diked area is designed to hold water, and would not let the sewage move freely thru the spoil. Sewage would therefore likely pond at the spoil surface, which we cannot permit.
3.) Our Rules limit the use of such spoil material to systems with less than 480 gallons of flow per day (Rule .1957(b)(2)). This was done to limit the magnitude of potential problems that are likely to occur when that dredge spoil material is used for sewage disposal.
4.) The tight packing of the spoil below 30 inches would limit the movement of sewage flow thru the spoil, increasing the likelihood of surface failure for the proposed system.

I do not know how to overcome the identified limitations for a ground absorption sewage disposal system at this site. Disposal would have to occur at a location other than the one investigated. It is likely that any disposal system designed for Stumpy Point would require a surface discharge for disposal. The Division of Water Quality should be contacted to explore any option requiring a surface discharge.

Sincerely,

Robert L. Uebler, Ph. D.

Field Services Team Leader
On-Site Wastewater Section
943 Washington Square Mall
Washington, NC 27889
252-946-6481