

CWSRF INTEGRATED PRIORITY RATING SYSTEM
NARRATIVE

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TOWN OF PITTSBORO, NORTH CAROLINA
SEPTEMBER 2015

WASTEWATER TREATMENT SYSTEM
IMPROVEMENTS



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CATEGORY I PROJECT PURPOSE

Line Item 1.D – Expanded Infrastructure

The Town of Pittsboro currently has a sewer collection system and wastewater treatment plant that serves customers inside the Town limits and extra-territory jurisdiction (ETJ). A 7,000-acre new development named Chatham Park is planned in and outside of the existing ETJ. The purpose of this project is to provide the first phase of wastewater service to accommodate future population growth needs for the Town's service area. A project location map showing the location of the Town boundaries, the ETJ, the future Town ETJ to be served and the Chatham Park development area is provided in the Supporting Documentation as Item 1.D.1. The Chatham Park development area is larger than the existing Town limits. The Town currently has a NPDES discharge permit allowing discharge of up to 1.249 mgd to Robeson Creek (existing outfall) and 1.971 to the Haw River (future outfall).

The current annual average wastewater flow from the Town is approximately 0.5 mgd. Peak daily flows can reach 1.4 mgd and the three-day sustained peak flow is 1.2 mgd. Future flow projections indicate an annual average wastewater flow increase for the Town and Chatham Park combined of 0.15 to 0.2 mgd per year. An evaluation of potential options for expansion of the existing WWTP, building a new treatment plant and pumping wastewater to Sanford was conducted. The project proposed in this application is the preferred option and has been approved by the Pittsboro Board of Commissioners.

The proposed project is to 1) refurbish the existing WWTP to replace older equipment and add treatment units for Total Nitrogen removal (to meet future NPDES permit requirements), and 2) construction of a 14-mile force main from the existing treatment plant area to the Big Buffalo Creek WWTP in Sanford, North Carolina. The map (Item 1.D.1) in the Supporting Documentation shows the location of the existing Pittsboro WWTP and the location of the proposed forcemain to Sanford. The map also shows the location of the 3M company which has a long term contract with the Town to buy reclaimed water from the Town's WWTP. There is an existing reclaimed water main from the WWTP to the 3M site.

The proposed project will provide a total of 2.75 mgd of sewer service capacity consisting of 0.75 mgd at the existing WWTP and 2.0 mgd of pumping capacity to Sanford. Wastewater pumped to Sanford will be treated and discharged at that facility. A total future sewer service capacity need of 4.5 mgd is projected for 2035 which would require a future project phase in approximately 10 to 12 years (if the projected growth rates materialize). This project applies only to the Phase 1, and provides flexibility in handling both peak flow events and potential variation in the actual growth rate associated with Chatham Park by providing two methods (treatment and pumping) to handle incoming wastewater.

The existing WWTP consists of influent screening, sidestream equalization pumping and storage, two activated sludge treatment package plants, tertiary filtration, UV treatment, reclaimed water treatment and pumping, and sludge storage. Over half of the WWTP units are over 30 years old. The reclaimed water system and equalization system components are less than ten years old and the Town is currently paying debt service costs on these improvements. The equalization system was installed to dampen

the effect of peak storm events and I/I flows, however at times the tertiary filters still need to be bypassed when the equalization tanks are full.

The refurbishment of the WWTP will maintain the current design capacity of the WWTP (0.75 mgd) and provide the benefits of continued wastewater treatment, continued supply of reclaimed water, and continued use of the relatively new infrastructure (i.e. equalization and reclaimed water system components). Expansion at the existing site is constrained by the small site footprint and floodplain surrounding the WWTP.

The construction of the pump station and force main to Sanford is necessary because the combined flows of the Town and Chatham Park are estimated to exceed 0.75 mgd by the Year 2020 (or sooner). The 14-mile force main would be 18-inch diameter and be located primarily along US Highway 15-501. The route includes two water crossings and approximately 6 miles of line that will likely require easements because there is limited controlled access along the highway.

The pump station will also allow pumping a portion of the average and peak flows to Sanford resulting in more steady and lower flows to the existing WWTP, thereby improving performance and avoiding by-passing of the filters.

The City of Sanford is highly amenable to accepting the Town's wastewater as the Big Buffalo WWTP is operating at approximately one-third of the plant's 12 mgd capacity. The Town, Chatham Park, and the City of Sanford have held several meetings regarding the force main proposal and user and debt service charges. The City of Sanford has provided a proposed debt service schedule to reserve 2 mgd of capacity and has provided a proposed volume charge. Chatham Park has indicated it is prepared to contribute to a portion of the project cost as negotiated by the Town and Chatham Park.

CATEGORY II PROJECT BENEFITS

Line Item 2.D – Project Addresses Promulgated but not yet Effective Regulations

The Proposed Project will reduce the Total Nitrogen Load discharged to Robeson Creek from the existing WWTP. The existing NPDES permit includes a requirement to meet future Total Nitrogen mass limits by January 1, 2019. This requirement is contained in the effluent limitations table in Section A.(4) on page 8 of 17 of the 2014 NPDES permit. A copy of this entire permit is provided in the Supporting Documentation as Item 2.D.1.

By January 1, 2019, the existing WWTP will need to meet a concentration limit of approximately 9 mg/L based on operation of the existing WWTP at 0.75 mgd (current design capacity). Effluent data from 2011 to 2014 indicates that the effluent Total Nitrogen varies from 20 mg/L to 29 mg/L at present. A copy of the tables with the Total N values highlighted is provided in the Supporting Documentation as Item 2.D.2. Thus, there is a very high potential for violations above the future Total N permit limit.

The proposed project will lead to compliance with the regulation by adding denitrification treatment units (anoxic tanks and conversion of tertiary filters to denitrification filters) to the existing treatment system. The units will be designed for a Total N limit of approximately 6 mg/L because as growth continues in the future, increased discharges will require a lower Total N mass from the existing WWTP due to the Total Nitrogen mass limit.

Line Item 2.J – Project Improves Treated Water Quality by Adding or Upgrading a Unit Process

Robeson Creek is currently classified as a WS-IV water. The creek discharges after approximately 4.7 river miles to Jordan Lake. The addition of denitrification units will result in removal of Total Nitrogen from the treated effluent that is discharged to the creek. The removal of total nitrogen will help improve the quality of the effluent discharge.

Supporting Documentation Item 1.D.1 shows the location of the existing WWTP, Robeson Creek and Jordan Lake. As the distance from the discharge point to the lake is relatively short, the removal of Total Nitrogen is beneficial to Jordan Lake.

CATEGORY III

SYSTEM MANAGEMENT

Line Item 3.C – Operating Ratio

From the LGC-108C Form for FY 2014 the revenues for the Water and Sewer Fund exceeded Operating Expenditures, including Capital Outlays, by \$143,852. The calculation of the Operating Ratio (OR) for FY 2014 is as follows:

OR =	$\frac{\text{Operating Revenues}}{(\text{Total Expenditures} + \text{Debt Principal} + \text{Interest} + \text{Capital Outlay})}$
From 108C Form for FY 2014	
Operating Revenues =	\$ 2,886,468 ①
Total Expenditures =	\$ 2,206,266 ②
Debt Principal =	\$ 436,459
Interest =	\$ 55,535
Capital Outlay =	\$ 32,356
OR =	$\frac{\mathbf{\$2,886,468}}{(\$2,206,266 + \$436,459 + \$55,535 + \$32,356)}$ <p style="text-align: center;">OR = 1.06</p>
<p>① Includes customer charges, tap fees, penalties and misc. water/sewer related revenue. ② Includes salaries, normal repair/maintenance and professional services.</p>	

Item 3.C.1 in the Supporting Documentation includes excerpts from the Town’s latest completed audit.

CATEGORY IV

FINANCIAL SITUATION

Line Item 4.A – Poverty Rate

Using the data obtained from the N.C. Division of Water Infrastructure’s website, the poverty rate for the Town of Pittsboro is 23.1%. This documentation is included the Supporting Documentation as Item 4.A. The calculation of the poverty rate to be entered on Line 4.A is as follows:

$$\text{Poverty Rate} = \frac{\% \text{ Poverty Rate}}{4} = \frac{23.1\%}{4} = 5.78$$

Line Item 4.B – Utility Rate as Percent of MHI

From data found on the N.C. Division of Water Infrastructure’s website, the Median Household Income (MHI) for the Town of Pittsboro is \$53,105. This documentation is included as Item 4.B in the Supporting Documentation. Using this and the Current Residential Sewer Bill for 5,000 gallons/month, from the NCDENR Water and Sewer Rate Form, the calculation of the Sewer Rate as Percent of MHI is as follows:

$$\begin{aligned} \text{Sewer Rate as \% MHI} &= 500 \times \left(\frac{\text{Current Residential Sewer Bill for 5,000 gal/mo.}}{\text{MHI} \div 12} \right) \\ &= 500 \left(\frac{\$55.81}{\$53,105 \div 12} \right) \\ &= 6.31 \end{aligned}$$

Line Item 4.D – Unemployment Higher than State Average

From data found on the N.C. Division of Water Infrastructure’s website, the unemployment rate for the Town of Pittsboro is 12.6%. The Average unemployment rate for the State of North Carolina is 11.1%. The documentation is included as Items 4.D.1 and 4.D.2 in the Supporting Documentation.