

**Town of Pittsboro**  
**Town of Pittsboro and Chatham County Water Conveyance System from City of  
Sanford WTP**  
**DRAFT Scope of Services**

**Project Understanding**

The Town of Pittsboro (Owner), Chatham County, and City of Sanford (hereinafter referred to as the Partners) selected Freese and Nichols Inc. (FNI) to perform preliminary engineering to identify necessary infrastructure to convey treated water from the City of Sanford Water Treatment Plant (WTP) to Chatham County's Triangle Innovation Point (TIP) and the Town of Pittsboro. The following details the Scope of Work associated with preliminary engineering phase of this work.

**BASIC SERVICES:** FNI shall render the following professional services in connection with the development of the Project:

**A. Preliminary Engineering Phase**

**1) Meetings**

**Project Kickoff Meeting**

FNI will meet with the Partners to review the scope, project team and schedule of the project, and present a data request memorandum. The data request memorandum may include:

- Latest water system GIS
- Town of Pittsboro Water Model
- Chatham County Water Model
- Latest Pittsboro Master Plan
- Latest Chatham County Master Plan
- Recent water system SCADA data
- Recent capital improvements plan for water system projects

Project management shall occur on an ongoing basis. Progress meetings will be held monthly to review and discuss the current status of the project, as well as next steps. In addition, as discussed herein, we will present the findings of the PER to each of the respective Partners elected officials.

**2) Transmission Main Routing:**

During the preliminary study a base route along NC Hwy 42, Corinth Road, Old US Hwy 1, and the Moncure-Pittsboro Rd was identified as a possible route for delivery of water from the Sanford WTP to the Triangle Innovation Point (TIP) and Pittsboro. FNI will build upon this work with a more detailed engineering study of the potential routes and make a recommendation for a final route selection to include consideration of one or more cross-country routes. The route assessment will take into account

obstacles such as railroad crossings, surface water crossings, switching sides of roads to avoid conflicts with existing utilities, a general estimate of easements required outside of road rights-of-way, property research to determine properties going to the center of road where easements within the road right-of-way are required, and other considerations that would influence the final design of the required facilities. The extents of the pipeline routes will be coordinated with the work for the City of Sanford and Fuquay-Varina waterline project. The route study will be generally based on publicly available GIS data, and will include up to three (3) route alternatives. The steps to complete the route selection are generally:

- GIS desktop review of the project area and identification of potential routes. This task will build on previous work provided by Freese and Nichols, Inc. as part of the Sanford/Pittsboro Partnering Study.
- Perform a preliminary site review of identified routes.
- Complete a route comparison assessing impacts, cost, hydraulics and other factors identified during the preliminary route review.
- Perform a preliminary review of trenchless crossings to determine appropriate trenchless technologies.
- Perform a preliminary easement review of routes to determine impacts and costs. Review shall be GIS based.
- Preliminary pump station siting will be performed based on hydraulic assessment results.
- If a booster pump station (BPS) is required, the BPS location will be established and a pump station component assessment will be performed to evaluate pump type, pump station layout and pump station ancillary facilities.
- Perform a secondary site review of the recommended route to further refine the route based on additional reviews.
- We will use available Lidar Data to evaluate each routes topography.

### 3) Distribution System Hydraulic Modeling

#### *Model Update and Verification and Demand Update*

We will use the existing Town of Pittsboro and Chatham County water models and update the following key components:

- Add new water lines 6-inches and larger based on the latest water system GIS.
- Add new elevated storage tanks and high service pump stations (if any) based on the latest water system GIS and as-built drawings.
- Scale existing water model demands to match current maximum and average day demand conditions.
- Scale future water model demands to match latest 2035 and 2060 maximum day and 2035 average day demand conditions.
- Update operational controls and perform a verification of the model using the Town and County's SCADA data, if available.

This project does not include hydraulic modeling of the City of Sanford water system.

#### *Entry Point and Interconnect Analysis*

Hydraulic modeling of both the County and Town's water systems will assess A) direct transmission line connections to each entity and B) passing water through the County's water system to the Town's water system to potentially defer the transmission line connection directly to Pittsboro. All entry point locations and interconnection location options will be reviewed and confirmed with the County and Town prior to conducting the hydraulic analyses.

- A) Two (2) entry point locations/configurations shall be evaluated within each of the two water systems to determine one (1) recommended connection point in each water system for the proposed transmission water lines.
- B) Two (2) options for interconnecting the County and Town water systems will be developed in conjunction with County and Town to determine one (1) recommended interconnection.

For both the entry point location/configuration and the interconnection evaluations, the hydraulic model of each water system will be evaluated under existing, 2035, and 2060 maximum day demand conditions with one (1) flow rate assumed from the Sanford WTP for each demand condition and receiving entity (County and Town). 2035 and 2060 model scenarios will include planned capital improvement projects as directed by the County and Town. Distribution system improvements will be recommended to convey water from the transmission water line entry points for each water system (no improvements will be recommended as part of the interconnection analysis).

#### *Water Quality Analysis*

Water quality impacts on the water system will be evaluated by establishing a baseline water age of each of the existing water systems and comparing future water system performance assuming either an interconnection condition or a direct transmission line connection. The future 2035 and 2060 water systems for each water system (with recommended improvements) will be evaluated under average day demand conditions and for one (1) flow rate assumed from the Sanford WTP for each demand condition and entity. The findings of the hydraulic analysis will indicate which connection type is to be assumed for each simulation. Including the baseline, this results in up to six (6) water age simulations.

Coordination will occur with the Town and County to determine the operating conditions to be simulated for each scenario.

#### 4) Transmission Hydraulic Modeling:

Coordination will occur with other ongoing transmission line projects from the Sanford WTP. There are two main components of the transmission system: one line from the Sanford WTP to the County entry point and one line continuing from the County entry point to the Town entry point. This analysis assumes up to two (2) booster pump stations (one at the City of Sanford WTP and one inline booster pump station along the transmission line, if needed). FNI will evaluate up to two (2) transmission line route alternatives and recommend one (1) route in conjunction with the route analysis in **Item 2**. The selected route will be further evaluated for up to three (3) transmission line size alternatives for each segment of the transmission line and for up to three (3) flow rate combinations from the City of Sanford WTP to the County and Town. The flow rate combinations will be determined in conjunction with the County and Town.

Once the transmission line route and sizes have been selected, up to four (4) system curves will be developed depending on the number of pump stations and transmission line segments selected by the County and Town. Pump station sizes and characteristics will be generalized for modeling purposes.

5) Reverse Flow in Transmission System

After the transmission line has been routed and sized, FNI will consider two (2) emergency scenarios involving water flowing from the Town and County back to the City of Sanford: one scenario will consider the proposed transmission line size and one scenario will consider a larger transmission line size. Any facilities required to reverse the flow in the transmission line will be generalized for planning purposes.

6) Cost Comparison

Preliminary costs for reviewed routes will be developed as a part of the route comparison. Upon selection of a recommended route and associated infrastructure, a project cost shall be developed. The project costs for the recommended improvements shall have the accuracy of AACE Class 3 cost estimates.

7) Construction Contracts and Sequencing

Develop preliminary project packaging and sequencing and associated detailed project schedules for implementation from final design through construction completion.

8) Permitting

Define the permits and approvals required for the recommended alternative and the anticipated durations required to procure each. Permitting will be coordinated with the EA effort.

9) Easements & Stakeholders

Define the stakeholders for the recommended alignment and develop an outreach plan to successfully convey project information to those affected by the project elements. Work with the Partners to develop an easement acquisition plan.

10) Analysis of Funding Options:

Funding opportunities will be evaluated for the recommended improvements. The evaluation will include a general summary of the requirement, application schedule, and funding limitations for identified funding opportunities.

11) Preliminary Engineering Report:

All findings and recommendations will be delivered in a final report. One draft with one set of revisions is anticipated. The findings and recommendations will be submitted and presented to each of the respective Partners Elected Officials.

**B. Environmental Support Services**

- 1) FNI will conduct an environmental analysis of the proposed water line alignments. The environmental analysis shall meet requirements under the National Environmental Policy Act (NEPA) of 1969 (42 United States Code), the President's Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of the NEPA (40 CFR 1500-1508), and the selected agency-specific NEPA implementing regulations. It is expected that the Client will identify one agency for NEPA coordination and submission. It is anticipated that the project impacts will meet the requirements for an Environmental Assessment (EA). If the project will have significant environmental impacts to the quality of the human environment, an Environmental Impact Statement (EIS) may be required. This SOW does not include effort and costs associated with the preparation of an EIS.

- 2) FNI will review environmental resources to determine the appropriate level of analysis. Assumptions made by FNI to estimate level of effort necessary to evaluate potential impacts on specific resource areas include:
  - a) Cultural/Historic Resources: FNI will conduct a desktop cultural/historical resources survey for the proposed project site. FNI will prepare a letter to the North Carolina State Historic Preservation Office (NC SHPO) requesting concurrence with the findings of the desktop survey. This SOW does not include effort and costs associated with a detailed cultural resources survey or preparation of detailed documentation by a historical architect for existing buildings within the project area. Should NC SHPO require additional cultural/historical resource investigation/documentation, FNI will prepare a contract modification for consideration by the Client for those services.
  - b) Noise/Traffic – This SOW does not include noise data collection, traffic data collection or noise/traffic modeling. Should project stakeholders require detailed data collection or modeling, FNI will prepare a contract modification for consideration by the Client for those services.
  - c) Hazardous and Toxic Materials – This SOW does not include collection and analysis of samples of soil, groundwater, or other environmental media at the site, including Phase I and/or Phase II Environmental Site Assessments (ESA).
  - d) Threatened and Endangered Species – FNI will coordinate a desktop review of US Fish and Wildlife threatened and endangered species available information for the project site. FNI will prepare a letter for USFWS requesting concurrence with the findings of the desktop review. This SOW does not include the effort and costs associated with a habitat assessment, presence/absence surveys for identified species within the project area, or any studies required beyond a desktop analysis to fulfill Section 7 consultation requirements.
- 3) Waters of the United States – FNI will coordinate a desktop review of the US Army Corps of Engineers (USACE) and USFWS databases for potential Waters of the United States (WOTUS) within the project area. This SOW does not include the effort and costs associated with a delineation of WOTUS within the project area or any necessary permits that may be required from USACE or State agencies for WOTUS.

### **Summary of Deliverables**

- Route Analysis (includes Permitting, Cost Estimates, Easements and Stakeholders)
- Modeling Results
- Water Age & Future System Capability Analysis
- Funding Analysis
- Draft EA
- Final EA
- Draft PER
- Final PER

### **C. Additional Services**

Additional Services to be performed by FNI which are not included in the services described above include but are not limited to the following:

- Temporary pressure testing services

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- Chlorine residual modeling
- Water system condition assessment
- Model training
- Detailed design of water lines and facilities
- Transient/surge modeling
- Design Phase Services
- Construction Phase Services

**TIME OF COMPLETION:** FNI is authorized to commence work on the Project upon execution of this Agreement and agrees to complete the services in nine (9) months from the Notice to Proceed (NTP).

If FNI's services are delayed through no fault of FNI, FNI shall be entitled to adjust contract schedule consistent with the number of days of delay. These delays may include but are not limited to delays in Partner or regulatory reviews, delays on the flow of information to be provided to FNI, governmental approvals, etc. These delays may result in an adjustment to compensation as outlined on the face of this Agreement and in Attachment CO.

The timeline for the EA may be shorter depending upon agency specific NEPA regulations. A specific timeline will be provided to the Client after the coordinating NEPA agency has been identified.

**COMPENSATION**

FNI shall perform professional services as outline herein for a not to exceed fee of \$375,000