

CITY OF HIGH POINT

AGENDA ITEM



Title: Whites Mill Lift Station Upgrade
Dewberry

From: Robby Stone – Public Services Director
Derrick Boone – Public Services Asst. Director

Meeting Date: June 21, 2022

Public Hearing: N/A

Advertising Date: N/A

Advertised By: N/A

Attachments: Attachment A- Whites Mill Sewage Pumping Station Upgrade design proposal
Attachment B- Map of Whites Mill lift station and proposed force main / siphon improvements

PURPOSE:

To hire Dewberry to design the upgrade improvements to the Whites Mill lift station, force main, and La Salle Drive Siphon.

BACKGROUND:

The Whites Mill lift station is a duplex sanitary sewer lift station that was upgraded circa 2006. The lift station service area consists primarily of residential properties as well as three schools. The lift station is near full capacity. A preliminary engineering report for the Whites Mill lift station was completed by Dewberry on November 12, 2021. The scope of the project will consist of the design of lift station improvements to expand the capacity of the lift station, and include the following additional improvements:

- The extension of a 10-inch diameter force main along Oak Hollow Drive and La Salle Drive to discharge immediately upstream of the La Salle Siphon.
- At the La Salle Drive Siphon, 320 feet of gravity sewer will be upsized immediately upstream of the siphon inlet chamber and an open-channel grinder will be installed.
- A third 8-inch siphon pipe will be installed by horizontal directional drill (HDD) across the lake to connect to the existing siphon chamber at the Lake Forest lift station.

The preliminary cost estimate to construct the Whites Mill Lift Station Upgrade and additional downstream sanitary sewer improvements is \$4.4 million dollars.

BUDGET IMPACT:

A capital project ordinance appropriating the project cost is included with this item. Revenue bonds associated with this ordinance are estimated to be issued in FY 2023-24 in accordance with the capital financing plan. Debt service payments will be paid from water and sewer revenues.

RECOMMENDATION / ACTION REQUESTED:

1. The Public Services Department recommends approval and asks for the Council to award the professional engineering services to Dewberry in the amount of \$442,700.
2. The Public Services and Financial Services Departments recommends and asks the City Council to approve the capital project ordinance for the Whites Mill Lift Station Project.



Lift Station Building



Dry Pit Access Hatch



Wet Well Access Hatch



Wet Well and Lift Station Site

"AN CAPITAL PROJECT ORDINANCE AMENDMENT
OF THE CITY OF HIGH POINT, NORTH CAROLINA FOR THE
WHITES MILL LIFT STATION UPGRADE PROJECT

Be it ordained by the City Council of the City of High Point, North Carolina, that,
pursuant to Section 13.2 of Chapter 159 of the General Statutes of North Carolina, the
following Capital Project Ordinance is hereby adopted:

- Section 1. This project is for the design and construction of the improvements to the Whites Mill Lift Station, including expanding the capacity of the lift station, force main extension, upsized gravity sewer, and installation of a siphon pipe. The Project will be paid by proceeds from water and sewer revenue bonds.
- Section 2. The following revenue is available to the City of High Point:
- | | |
|-----------------------|-------------|
| Revenue Bond Proceeds | \$5,450,000 |
|-----------------------|-------------|
- Section 3. The following amounts are appropriated for the Project:
- | | |
|---------------------|-------------|
| System Improvements | \$5,450,000 |
|---------------------|-------------|
- Section 4. The Financial Services Director is hereby directed to maintain a Capital Project with sufficient detail accounting records to allow compliance with G.S. 159-28 Budgetary accounting for appropriations
- Section 5. Copies of this capital project ordinance shall be made available to the City Manager and the Financial Services Director for direction in carrying out this project."

Adopted by High Point City Council, this the 21st day of June 2022

Mayor, Jay W. Wagner

ATTEST

Lisa B. Vierling,
City Clerk

June 6, 2022

ATTACHMENT A

City of High Point
Attn: Derrick Boone, PE
Assistant Director of Public Services
PO Box 230
211 South Hamilton Street
High Point, NC 27261

RE: Design - Whites Mill Sewage Pumping Station Upgrade
On-Call Engineering - Supplemental Agreement for Professional Services to Master Agreement

Dear Mr. Boone,

Dewberry Engineers is pleased to provide this scope of services to continue work with City of High Point. This task is proposed as an assignment to our On-Call Agreement dated April 2018.

Project Understanding

On November 12, 2021, Dewberry submitted a preliminary engineering report (PER) that evaluated capacity and upgrade alternatives for the Whites Mill Pumping Station (PS). The report also identified possible downstream capacity limitations and hydraulic improvements to accommodate the additional flow.

The City now requests that Dewberry provide design services to facilitate the improvements. The improvements will include:

1. Whites Mill Sewage Pumping Station
 - a. Influent manholes and sewer to redirect flow to the new wet well
 - b. Wet well with 75 HP duplex submersible pumps with a capacity of 1,000 gpm
 - c. Valve vault with check valves and isolation valves
 - d. Emergency bypass connection to the force main
 - e. A short section of force main that connects to the existing 8-inch force main
 - f. 1-ton jib crane to facilitate pump removal
 - g. Pump control panel, variable frequency drives (VFDs) and automatic transfer switch within the existing electrical building
 - h. Outdoor, sound attenuated 200 kW diesel generator with a belly fuel tank sized for 48 hours of operation at 100% load located away from the property line given the proximity of neighboring homes.
 - i. 480-volt, 300-amp electrical service and transformer
 - j. A service disconnect in an enclosed breaker located on the exterior building wall
 - k. A step-down transformer for 120-volt panelboard
 - l. Driveway extension to the proposed wet well
 - m. LED lighting and grounding ring installed

- n. Air conditioning system in the existing electrical building to maintain a conditioned space for the variable frequency drives.
 - o. The new electrical installation will be compliant with the NEC and proper hazardous classifications under NFPA 820, with electrical design to alleviate conduit seal off fittings on the pump submersible cable.
 - p. A door-actuated alarm.
2. Force Main Extension
- a. The force main extension will be 10-inch diameter.
 - b. Additional combination air relief / vacuum relief valves at high points.
 - c. The force main will extend along Oak Hollow Drive and La Salle Drive with discharge immediately upstream of the La Salle Siphon.
3. La Salle Drive Siphon
- a. Influent Gravity Sewer
 - i. Upsize and adjust invert elevations for approximately 320 feet of gravity sewer immediately upstream of the siphon inlet chamber to increase capacity to the siphon and compensate for headloss from the grinder
 - b. Grinder
 - i. Open-channel grinder suitable for flows up 1,800 gpm within 5-foot precast concrete chamber
 - ii. 1-ton jib crane to facilitate grinder removal
 - iii. Fence
 - iv. 15-foot wide gravel access road to the La Salle Drive Siphon inlet chamber from La Salle Drive.
 - v. 240/120V, single-phase, 100-amp electrical service from La Salle Drive to power grinder and provide telemetry
 - vi. Service entrance rated panelboard
 - vii. Electrical equipment rack
 - c. Third 8-inch siphon pipe
 - i. Horizontal directional drill (HDD) an 8-inch HDPE pipe across the lake
 - ii. Connect to existing siphon chamber at Lake Forest PS

Scope of Services

- 1) **Task 100** – Project Initiation and Design Management
- a) A project kick-off meeting will be held at the City's office. A detailed Microsoft Project schedule will be developed for the project's design and permitting phases. The schedule will incorporate interim deliverables and review periods for submittals, review time, regulatory approval and bid phase duration.

- b) Progress meetings will be held to review deliverables during the project. A total of three (3) meetings at the City's office are budgeted, which includes review meetings for 30, 60, and 90 percent review meetings. Three weeks shall be included in the project schedule for City review before each meeting.
- c) Kickoff and progress meetings will have a virtual option for those unable to attend in person.
- d) Regularly scheduled phone calls for project updates and coordination will be held approximately every 3-4 weeks.
- e) A monthly engineer's report will be submitted with each monthly invoice.

2) **Task 200** – Topographical Survey

- a) A survey will be developed to create an existing conditions site plan for the pumping station and pipelines.
- b) Record drawings for the pumping station, gravity sewer, force main, and siphon system will be used as a basis for determining the City's sanitary sewer infrastructure.
- c) Whites Mill Pumping Station Survey
 - i) The survey area at the pumping station encompasses approximately 0.5 acres around the existing pumping station. The survey will include structures, visible pipes and structures, gravel and pavement areas, fence, and utilities.
- d) Lake Forest Pumping Station Survey
 - i) The survey area at the pumping station encompasses approximately 0.3 acres around the existing pumping station. The survey will include structures, visible pipes and structures, gravel and pavement areas, fence, and utilities to ascertain HDD alignment.
- e) Pipeline Survey
 - i) The survey area along the proposed force main route is approximately 5,000 linear feet, starting at the intersection of Oak Hollow Drive and Whites Mill Road, then extending southward along Oak Hollow Drive, then extending along La Salle Drive to 3902 La Salle Drive, then extending behind 3902 La Salle Drive, then along the existing sewer easement across Oak Hollow Lake to the Lake Forest Pumping Station.
 - (1) When in streets, the survey will encompass edge-of-pavement to edge-of-pavement.
 - (2) When in unimproved areas or over the existing sewer easement, the survey will encompass a 100-foot width.
 - (3) A bathometric survey across the lake will be performed to establish lakebed elevations.
- f) The ground survey will include, but not be limited to, the following:

- i) Establishing benchmarks. Set a horizontal control for the duration of the project. Set vertical control based upon NAVD 88 datum. Set benchmarks throughout the project and labeled on the files provided.
 - ii) Topography along the alignment
 - iii) Pipe and culvert inverts, pipe and culvert size, top of lake, utilities located via subsurface utility engineering (SUE), pavement material type.
 - iv) Water main and service location based upon City designation
 - v) Electric utility location based upon City designation
 - vi) Survey will be developed in AutoCAD format
 - vii) AE Flood Zones (100-year flood) and X Flood Zones (500 year) based upon GIS data will be shown.
 - viii) Property corners and lines along Oak Hollow Drive and La Salle Drive will be based upon GIS information except for the following areas:
 - (1) Whites Mill Pumping Station lot. Property corners for homes where Tesa Court borders the station's lot will be located.
 - (2) Proposed siphon access road. Property corners for the backyard of homes along La Salle Drive will be located.
- 3) **Task 300** – Subsurface Utility Engineering (SUE)
- a) Level B SUE will be performed along the proposed force main route starting at the intersection of Oak Hollow Drive and Whites Mill Road, then extending southward along Oak Hollow Drive, then extending along La Salle Drive to 3902 La Salle Drive.
- 4) **Task 400** – Easement Plat and Legal Description
- a) A boundary survey will be performed and easement plats with legal description created for the following lots, on an as needed basis:
 - i) 3902 La Salle Drive
 - ii) 3906 La Salle Drive
 - iii) 3908 La Salle Drive
 - b) Plats will be developed in accordance with city and county guidelines and will include, but not be limited to the following:
 - i) New easement areas to be acquired shown on parcel or in legend
 - ii) Existing easement areas to be abandoned, if applicable

- iii) Delineate flood plain on affected lots
- iv) Existing easements of record with recorded reference
- v) Current Owner Name, Parcel Street Address
- vi) Any structural improvements lying within new easement

5) **Task 500** - Geotechnical Investigations

a) General

- i) A geotechnical investigation will be performed and a final geotechnical report provided.
- ii) If refusal is encountered in fill material, an offset boring will be performed.
- iii) Measure groundwater in each bore hole.
- iv) Backfill and patch with cold asphalt in paved areas.
- v) North Carolina 811 OneCall for existing utility locates in the vicinity of the bore holes.

b) Whites Mill Pumping Station

- i) One (1) soil penetration test (SPT) to determine soil characteristics, foundation requirements and potential rock removal. The boring will be approximately 35 feet deep, based upon the proposed wet well depth of approximately 25', unless rock is encountered that results in boring refusal.

c) Force Main

- i) Eleven (11) borings will be performed to a depth of 10 feet, unless rock is encountered that results in boring refusal. This quantity of bores results in geotechnical investigations at approximately 500-foot intervals. Rock core samples will be tested for compressive strength, tensile strength, point load index strength, punch penetration and total hardness.
- ii) Two days of traffic control.

d) Siphon

- i) On the land
 - (1) Four (4) borings will be performed to a depth of 50 feet, unless rock is encountered that results in boring refusal. Two borings will be performed near the lake edges; two will be performed approximately 100-200 feet inland from the shoreline.
 - (2) If refusal material is encountered more than 10 feet above the planned boring termination depth, 10-feet of rock will be cored (if authorized) in two of the borings to characterize the refusal material. Two unconfined compressive strength tests and MOHs hardness determination of the rock in the borings will be performed (if encountered).

- ii) In the lake
 - (1) Mobilize a barge drill rig (utilizing a crane to place barge) and support equipment in Oak Hollow Lake to perform one SPT boring to a depth of approximately 50 feet beneath the water surface.
 - (2) If auger refusal is encountered in the boring prior to 50 feet, the auger refusal materials will be cored using rock coring techniques for 10 feet or to a minimum depth of 50 feet (whichever is greater) to identify the refusal material and obtain rock core samples for laboratory testing.
 - (3) The borehole will be located utilizing a GPS unit.
 - (4) Determine elevation of the borehole utilizing available topographic information. Backfill borehole with tremie cement-bentonite grout.
 - (5) Perform one unconfined compressive strength test and MOHs hardness determination of the rock (if encountered).
- e) The geotechnical report will address the following items:
 - i) Description of the proposed construction and regional geology.
 - ii) Descriptions of the field exploration and laboratory testing programs, including preparation of a site location plan, boring location plan, and a summary of laboratory test results that define existing soil conditions.
 - iii) Lab tests include moisture content, Atterberg limits and grain size analysis.
 - iv) Matt foundation considerations under the wet well.
 - v) Lateral earth pressure information.
 - vi) Description of the subsurface conditions including the preparation of typed boring logs, and subsurface profiles with soil stratigraphy.
 - vii) Descriptions of groundwater conditions encountered and recommendations for management of groundwater during construction.
 - viii) Site preparation and earthwork construction recommendations including evaluation of site soils for use as structural backfill, and soil compaction requirements for backfill.
 - ix) General shoring/excavation considerations.
 - x) Recommendations for quality control and materials testing.
 - xi) Expected settlement.

6) **Task 600** – Wetlands Delineation

- a) None at this time.

7) **Task 700** – Design

- a) Prepare Contract Documents consisting of one set of final drawings and technical specifications showing the scope, extent, and character of the work to be performed and furnished by Contractor including, but not limited to, the following.
 - i) Detailed drawings for the Whites Mill Pumping Station improvements and demolition.
 - ii) Detailed plan and profile drawings for force main, gravity sewer and siphon.
 - iii) Detailed drawings for La Salle siphon inlet and outlet chamber modifications.
 - iv) Plan views showing proposed utilities and relevant features including right-of-way, existing known utilities, easement and property lines.
 - v) Details for construction of trenchless crossings of Oak Hollow Lake based upon HDD.
 - vi) Standard details.
 - vii) Sediment and erosion control requirements.
 - viii) Specifications to include:
 - (1) Bid Form table.
 - (2) Measurement and payment descriptions.
 - (3) Technical specifications.
- b) Thirty percent documents will include the following:
 - i) Whites Mill Pumping Station
 - (1) Preliminary site plan showing wet well, valve vault and generator location.
 - (2) Preliminary yard pipe plan showing gravity sewer and force main alignment.
 - (3) Preliminary electrical site plan.
 - (4) Preliminary electrical building plan.
 - (5) Preliminary electrical single-line diagram.
 - ii) Preliminary plan and profile views for siphon.
 - iii) Table of Contents for project specifications.
 - iv) Listing of utility conflicts and utility owners

- v) Updated opinion of probable construction cost.
- c) Sixty percent documents will include the following:
 - i) Refined pumping station drawings.
 - ii) Refined siphon drawings.
 - iii) Preliminary plan and profile views for the force main and gravity sewer.
 - iv) Preliminary technical specifications.
 - v) List of permit applications
 - vi) Preliminary geotechnical findings
 - vii) Map with list of affected properties for temporary and permanent easements.
 - viii) Updated opinion of probable construction cost.
- d) Ninety percent documents will include the following:
 - i) Prefinal pumping station drawings.
 - ii) Prefinal plan and profile views for the force main, gravity sewer and siphon.
 - iii) Prefinal technical specifications.
 - iv) Permit applications.
 - v) Final geotechnical report.
 - vi) Updated opinion of probable construction cost.
 - vii) Final plats and legal descriptions.

8) **Task 800** - Regulatory Permitting

- a) Dewberry will prepare permit applications. The following permits applications are anticipated:
 - i) Sedimentation and Erosion Control Plan from the North Carolina Division of Energy, Mineral and Land Resources (DEMLR). Dewberry will pay up to \$1,000 for the application fee.
 - ii) NCDEQ Standard Sewer Extension. Dewberry will pay the \$480 application fee.
 - iii) If required, prepare Army Corp of Engineering permit for crossing the lake. Dewberry will pay the \$480 application fee.

9) **Task 900** - Bid and Award Phase Services

- a. Provide a PDF of the Bid Documents to the City.

- b. Administer pre-bid meeting, prepare meeting minutes and provide a PDF copy to the City.
 - c. Prepare addenda and provide PDF copy to the City. An addendum will interpret, clarify or further define the Bid Documents or provide a response to bidder's written questions. Two (2) addenda are anticipated.
 - d. Evaluate bids and prepare a letter of recommendation of award
 - e. Prepare conformed Construction Documents based upon inclusion of any addenda.
 - f. Deliverables:
 - i. Addenda
 - ii. Prepare Certified Bid Tabulation
 - iii. Recommendation of Award
 - iv. Three (3) printed sets and PDF of conformed Construction Documents
- 10) **Task 1000** – Construction Administration Services
- a) No services at this time.
- 11) **Task 1100** – Construction Observation Services
- a) No services at this time.
- 12) **Task 1200** – Post Construction Services
- a) No services at this time.

Fee

Dewberry will complete the Scope of Services for the fees as detailed below.

| Task | Description | Fee | Format |
|------|--|-----------|--------|
| 100 | Project Initiation and Design Management | \$19,200 | LS |
| 200 | Topographic Survey | \$58,500 | LS |
| 300 | Subsurface Utility Engineering | \$56,500 | LS |
| 400 | Easement Plats (3 at \$2,400 each) | \$7,200 | EA |
| 500 | Geotechnical Investigations | \$63,800 | LS |
| 600 | Wetlands Delineation | - | N/A |
| 700 | Design | \$195,500 | LS |
| 800 | Permitting | \$19,700 | LS |
| 801 | USACOE Permitting, if necessary | \$4,300 | LS |
| 900 | Bid Phase | \$18,000 | LS |
| 1000 | Construction Administration | - | TBD |
| 1100 | Construction Observation | - | TBD |
| 1200 | Post Construction | - | TBD |
| | Total | \$442,700 | |

1. Task 801 will only be performed upon written authorization from High Point.

Schedule

Dewberry will complete the Scope of Services as noted below.

1. Fourteen (14) weeks for 30% documents after receiving a Notice to Proceed.
2. Seven (7) weeks for 60% documents after the 30% design review meeting.
3. Seven (7) weeks for 90% documents after the 60% design review meeting.
4. Four (4) weeks for final bid documents after the 90% meeting or receipt of permits, whichever is later.

Exclusions

1. Completion of the Flow Tracking/Acceptance Form (FTSE 04-16) associated with the Standard Sewer Extension Permit.
2. SUE Quality Level A is not required.

Assumptions

1. The City will prepare Flow Tracking/Acceptance Form (FTSE 04-16) for the Standard Sewer Extension Permit.
2. ARC flash study will be performed by Contractor and it will evaluate only the new electrical systems
3. Pump station controls will be specified by Dewberry, but the Contractor shall provide the system integrator.
4. Wetlands are not present with the project area.
5. The City's existing telemetry system will be reused at the Whites Mill Pumping Station.

Mr. Derrick Boone PE
June 6, 2022

Sincerely,

A handwritten signature in black ink that reads "Steve Hilderhoff". The signature is fluid and cursive, with the first name "Steve" and last name "Hilderhoff" clearly legible.

Steve Hilderhoff, PE
Project Manager/ Associate

A handwritten signature in blue ink that reads "Jeffery J Wing". The signature is stylized and cursive, with the first name "Jeffery" and last name "Wing" clearly legible.

Jeffery J Wing, PE LEED AP
Associate Vice President

WHITES MILL SEWAGE PUMPING STATION UPGRADES PROPOSED IMPROVEMENTS

