

CITY OF HIGH POINT

AGENDA ITEM



TITLE: Ensley Creek Outfall Alternatives Evaluation— Professional Engineering Services CDM Smith	
FROM: Robby Stone – Public Services Director Derrick Boone – Asst. Public Services Director	MEETING DATE: June 3, 2024
PUBLIC HEARING: N/A	ADVERTISED DATE/BY: Master Agreement - Task Order
ATTACHMENTS: Scope of Services Map	

PURPOSE: To approve a Task Order with CDM Smith for the Professional Engineering Services to evaluate the Ensley Creek sanitary sewer outfall. The city has a Master Agreement for Professional Services with CDM Smith.

BACKGROUND: The Ensley Creek sanitary sewer line was constructed in 1958. It is located on the south side of High Point and is one of three major sanitary sewer outfalls that discharge to the Westside Wastewater Treatment Plant. The length of the Ensley Creek Outfall is 28,000 linear feet and there are 17 aerial sections (see attached map). Phase 1 of the alternative's evaluation will include the following:

- Visual and structural inspection of the aerial sewers and supports.
- CCTV (closed-circuit television) inspection of the 17 aerials.
- Determination of the appropriate replacement size for the Ensley Creek aerial sewers based on the current and future flow projections from the sanitary sewer hydraulic model.
- Quality assurance (QA) and Quality Control (QC) of the model, results, and deliverables.
- Final report of the alternative's evaluation and recommendations for project extents and sizing.

Phase 2 is not included in this contract but would include a preliminary engineering report (PER) that would be based on the number and extent of the sewer lines to be upsized as determined by Phase 1.

BUDGET IMPACT: Funds for this project are available in the FY 2023-2024 budget.

RECOMMENDATION/ACTION REQUESTED: The Public Services Department recommends approval and asks for the Council to award this Task Order for Professional Engineering Services to CDM Smith in the amount of \$115,000 and authorize appropriate city staff to execute all necessary documents.





5400 Glenwood Avenue, Suite 400
Raleigh, North Carolina 27612
tel: 919-325-3500

May 14, 2024

Mr. Derrick Boone
Assistant Public Services Director
City of High Point
211 S. Hamilton Street
High Point, North Carolina

Subject: Ensley Creek Outfall Alternatives Evaluation
 Proposal for Engineering Services

Dear Mr. Boone:

CDM Smith Inc. (CDM Smith) is pleased to submit this Proposal for Engineering Services to the City of High Point for the Ensley Creek Outfall Alternatives Evaluation based on our phone conversation and the Background Section presented below.

A. BACKGROUND

In 2018, CDM Smith developed a Sanitary Sewer Hydraulic Model for the City of High Point (City) generally for sewers greater than 18-inch in diameter and associated pump stations. CDM Smith also developed a Wastewater Master Plan (WWMP) including future flow projections and a capital improvements plan (CIP) in 2018 (final document completed in 2019.) A model update, revised CIP, and model expansion were undertaken in 2023-24 due to three main issues: 1) several system improvements were implemented or are under construction (including a new parallel Riverdale pump station (PS) force main, an upgrade to Registers Creek PS and new manifolded force main, and a new and re-routed Waterview PS force main); 2) the prior CIP was driven by the assumption that the City did not wish to upgrade the Riverdale PS beyond 30 mgd capacity. The City now plans to upgrade Riverdale PS to 45 mgd; 3) the City has been receiving development requests in upstream portions of the system for which capacity is unclear.

CDM Smith proposed a two-phase approach to address these issues. Phase 1 is complete and included a model update and revised CIP (Final Report January 2024) and an initial expansion of the model to sewers 10-inch and larger (but without the re-calibration, flow data, and improvement needs for the expanded sewers.) Phase 2 is planned for future years and includes a master plan update to re-calibrate the model, meter flows, adjust flow projections, and add required improvement projects to the CIP for the 10-inch to 18-inch expanded model sewers.

Associated with these efforts, CDM Smith evaluated the Ensley Creek Sewer Outfall Capacity in 2021 to determine whether a 1 mgd flow from Trinity could be accommodated. The results and



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recommendations were presented in a September 24, 2021, memo titled “City of Trinity – Sewer Hydraulic Modeling – Final (Revised)”. In this memo, CDM Smith explained that the Ensley Creek sewer was quite long (approximately 22,000 lf from the Trinity connection downstream) and shallow. If a 5-yr design storm/5-yr risk level was assumed, then the entire sewer would need to be upsized (approximately 22,000 lf from the Trinity connection downstream). However, if the City was willing to accept a 2-year level of risk, the sewer could handle the 2-yr design storm and the 1 mgd Trinity flow with no sewer upsizing other than raising 2 manholes (sewer surcharged but more than 3 feet from the rim during the 2-year event.) The City decided to allow the Trinity flow and accept the 2-yr level of service for the Ensley Creek Outfall.

During routine inspections in 2024, the City found a structural problem with one of the aerial crossings. To consider replacement options, replacement with a sewer sized to convey the 5-year design storm should be a consideration. To fully convey the 5-year design storm, the entire 28,000 lf of outfall must be upsized. However, the City could phase the sewer replacement and upsizing process by starting with aials with structural concerns and/or starting with the upstream sections first and then working downstream. Replacement of any aerial sewer sections should be sized to convey the 5-yr design storm and consider buildout flows.

CDM Smith proposes completing the work in two phases as the costs for the PER (Phase 2) will depend on the number and extent of sewers to be upsized (to be determined as part of Phase 1.)

B. SCOPE OF SERVICES

The proposed scope of services for each phase are described in more detail below. A budget estimate is provided for Phase 1. Phase 2 costs will depend on the extent of sewers to be upsized (to be determined as part of Phase 1.) Figure 1 shows the locations of the 17 aerial sewers (totaling approximately 1,300 linear feet (lf). The project extents for the Phase 1 analysis are also shown.

PER Phase 1 – Evaluate Alternatives, Sizing, and Project Extents

Phase 1 includes the following 3 tasks:

Task 1 – Information Review and Data Collection

CDM Smith will review the aerial crossings and As-Built Drawings provided and verify against modeled attributes. CDM Smith will review the 2045 Comprehensive Plan and compare current flow projections (including buildout) against the plan information to assess whether revised projections are warranted.

CDM Smith will perform visual structural inspections for the aerial sewers and supports to determine if the supports could be re-used and if any other aerial crossings appear to be in poor condition from external visual inspection. Two of the 17 aials may be too elevated to view the pipe up close (approximately 9 feet and 12 feet off the ground). For these locations, the focus will

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be on the pier supports and the possibility of re-using the piers along with the CCTV pipe assessment.

CDM Smith's subcontractor, Vision, will perform CCTV of the 17 aerial sewers shown in Figure 1. The CCTV assessment will allow the City and CDM Smith to determine which aerial sewers are high priority for replacement and which could be replaced later. (It should be noted that if the City would like to CCTV the entire stretch of sewer containing the 17 aerals (approximately 16,500 lf of 12 to 24-inch sewer), the cost would be an additional \$75,000 for CCTV and engineering data analysis. This effort is not included but could be added at this additional cost.)

CDM Smith's subcontractor, Stewart Engineering, will perform manhole rim and invert survey on 12 manholes to verify some questionable data in the existing expanded hydraulic model. City will assist with access as needed.

Task 2 - Sizing and Project Extents

Using the existing expanded model, CDM Smith will determine the appropriate replacement pipe size for the Ensley Creek aerial sewers based on the 5-yr design storm and considering buildout flow projections. Relative replacement costs for comparison of alternatives will be determined to finalize recommended project extents based on both the findings from Task 1 and the model, but these costs will not be an opinion of probable construction cost (OPCC). The OPCC will be developed in Phase 2.

CDM Smith will prepare a draft letter report that includes documentation of the alternatives evaluation and recommendations for project extents and sizing. Comments from the City will be addressed, and a final letter report issued.

Task 3 – Project Management & QAQC

CDM Smith will perform monthly invoicing and quality management procedures including quality assurance (QA) and Quality Control (QC) of the model, results, and deliverables.

Contingency Task 4: Revise Future Flow Projections – Task 1 budget includes effort to review and check future flow projections and buildout against more recent available information, but does not include revisions to the flow projections as the assumption is that not enough new information is available to justify revisions. However, if revisions are required, the projections can be adjusted using the budgeted funding from this contingency task. This task would only be performed with City approval.

Assumptions

- 1) Trinity flows remain limited at 1 MGD for all conditions evaluated.

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- 2) Owner will provide all access and notifications required for the work.

PER Phase 2

Phase 2 is expected to include the following four tasks to determine how to replace the priority pipe extents determined in Phase 1 (details still to be determined):

Task 1 – Data Collection

CDM Smith will perform limited survey and geotechnical data collection required to evaluate routing options such as a potential siphon, pier replacement, or a parallel sewer. A complete survey and geotechnical investigation will be performed during final design.

Task 2 – Alternatives Analysis and OPCC

CDM Smith will analyze alternatives on how to replace the aerial sewers (or alternate project extents). CDM Smith will analyze routing options such as a potential siphon, pier replacement, or a parallel sewer. CDM Smith will perform a materials evaluation & pier analysis for replacement pipes of larger size and potentially alternate materials.

CDM Smith will develop a preliminary OPCC for the selected alternative.

Task 3 – Preliminary Engineering Report (PER)

CDM Smith will combine key information from Phase 1 along with the analysis, recommendations, schedule, and OPCC from Phase 2 into a preliminary engineering report (PER). The PER will include an analysis of the various alternatives, which will include considerations for traffic impacts, private property impacts, easement acquisition, environmental impacts, operation and maintenance, and cost comparison. A proposed construction schedule and permitting plan. A final report will be delivered within 3 weeks of receiving comments on the draft report.

Task 4 – Project Management and QA/QC

CDM Smith will perform monthly invoicing and quality management procedures including QA/QC of the model, results, and deliverables.

C. SCHEDULE

Phase 1 will begin within 2 weeks of notice to proceed and be completed within 4 months.



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Phase 2 will begin upon notice to proceed with a final determination of which sewers to include in the PER and after a revised scope, fee, and schedule are approved.

D. COMPENSATION

For the Phase 1; Tasks 1-3 Services performed by CDM Smith under Section B of this Task Order, the City agrees to pay a lump sum fee of \$105,000. Task 4 Contingency task for \$10,000 will not be used unless required and authorized in writing by the City. The upper limit of Phase 1 including contingency is \$115,000. For the Phase 2 Basic Services performed by CDM Smith, the City will amend this contract adding additional compensation for these tasks once the final scope, fee, and schedule are negotiated. In addition to this compensation, the City reserves the right to amend this Contract, so that CDM Smith may furnish additional services as needed. Payments shall be made by the City monthly in proportion to the percentage of work completed, with the balance of payment made when the work is complete.

Thank you for the opportunity for CDM Smith to serve the City of High Point and your customers. We look forward to further discussing this proposal with you. If you have any questions or need any additional information, please let us know.

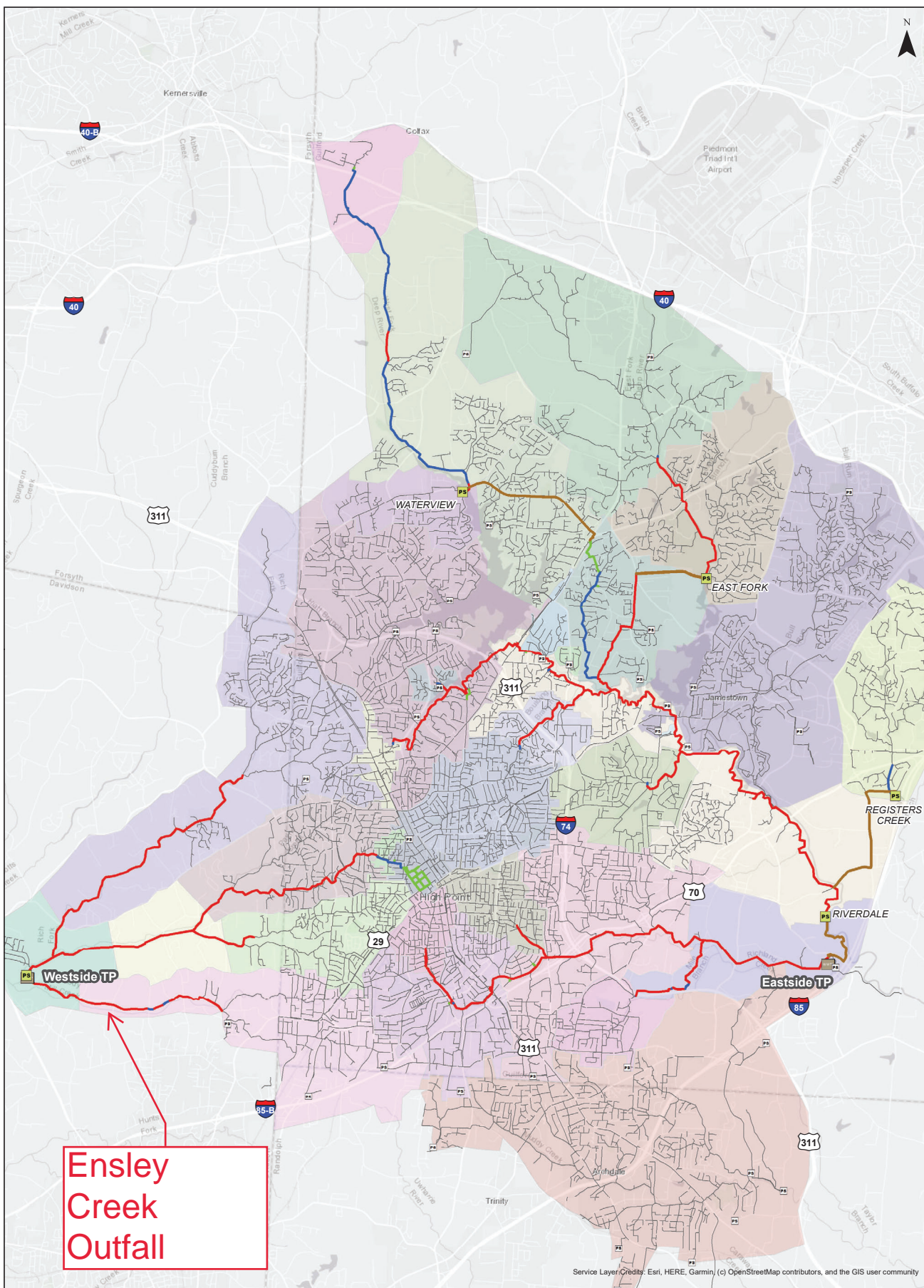
Sincerely,

A handwritten signature in black ink that reads "Christine Nesbit". The signature is written in a cursive, flowing style.

Christine Nesbit, P.E.
Vice President
CDM Smith Inc.

Cc: Robby Stone, Public Services Director, City of High Point
Glendon Fetterolf, CDM Smith Inc.





Ensley
Creek
Outfall

Legend

- PS Modeled Pump Station
- PS System Pump Station
- WTP Wastewater Treatment Plant
- Modeled Pipes - 12" or Less
- Modeled Pipes - 15" to 19"
- Modeled Pipes - 20" or Greater
- Modeled Force Main
- System Gravity Main

Figure ES-4
Modeled
Collection System

High Point, NC

1 inch = 1.25 miles
0 0.5 1 1.5 2
Miles

**CDM
Smith**

