



1100 Marion Street, Suite 300
Knoxville, Tennessee 37921
tel: 865.963.4300
fax: 865.963.5311

October 10, 2023

Mr. Chad Austin
Water Services Division City of Kingsport
1113 Konnarock Rd.
Kingsport, TN 37664

Subject: South Fork Holston Sewershed Capacity Study

Dear Mr. Austin:

CDM Smith is pleased to present our proposal to support the City of Kingsport with South Fork growth and development modeling and pump station assessment support. Modeling will be based on proposed future developments delivered to CDM Smith within 45 days of final authorization to execute this proposal. All analysis in this task order will be based on these proposed additions.

Background

CDM Smith developed an EPA SWMM 5.0.014 trunk sewer model and calibrated the model to flow monitoring data obtained in the spring of 2008. The level of service of the existing trunk sewer system was assessed for a range of evaluation storms for existing baseline (2010) and future (2030) loading conditions. Recommended system improvements were developed through use of the hydraulic model to select optimal locations and appropriate improvements including increased conveyance, added storage, and reduced rainfall derived inflow and infiltration (RDII) through system rehabilitation.

In 2011, the City of Kingsport requested that CDM Smith provide a consistent approach to analyze and certify capacity of the existing system when considering the permitting of additional connections to the sanitary sewage collection system. For this effort, the trunk sewer model was expanded to a system-wide model i.e., from 1,800 to more than 12,000 nodes; from 23 to 94 lift stations representing actual locations and an additional six virtual lift stations representing low-pressure sewer systems with multiple service connections; and the modeled locations for dry- and wet-weather flows from 166 to 4,049 locations. The system-wide model was developed using EPA SWMM 5.0.022 and was verified against the trunk sewer model that was originally calibrated to 2008 flow monitoring data. The verification of the system-wide model was assessed at the original trunk model calibration locations (2008 flow monitoring locations). The completed capacity certification tool (CAP Tool) used the system-wide model output as the baseline for existing system capacity. From the existing capacity, development and credits were managed by the CAP Tool.





Mr. Chad Austin

October 10, 2023

Page 2

In the Fall of 2019, the City of Kingsport secured CDM Smith's services to help with flow monitoring and model updates. As part of the updates, the model was converted to EPA SWMM 5.1.013. Flow monitoring, model updates, and calibration updates were completed in the spring of 2021 (with additional calibration in the West Kingsport area in 2023) and the future flows extended to 2040.

Scope of Services

The detailed scope of work for the basic services included under this proposal are described below.

South Fork Basin – Future Development Modeling Analysis and Pump Station Assessments

Task 1 – Pump Station Assessments

This task will include determining current pump station capacities via pump curves and pump drawdown testing for all operating conditions. Additionally, general condition assessments will be made as to the electrical, equipment, HVAC, and pump station building conditions to further assist the City should modeling assessments in Task 2 note needs for capacity upgrades. This proposal is based on 10 station locations as noted in the RFQ from the City dated July 1, 2023: PS 124 - Riverport, PS 408 - Moreland Drive, PS 405 - Kendrick Creek, PS 203 - Old Mill, PS 202 - Rocky Branch, PS 304 - Sam's, PS 201 - Central High School, PS - 303 Cracker Barrel, PS - 302 Centenary, and PS 301 - Airport. Additional stations, budget, and schedule are amendable to this scope with written approval from the City.

Task 2 – Modeling Analysis

This task will include compiling information from the City on all the proposed developments for the South Fork Basin, including structure types and proposed numbers of structures (ex. condos, single family residential, apartments, etc.). Compiled development information submitted to CDM Smith within 45 days of final authorization to execute this proposal will then be used to estimate new flows being added to the collection system under this task order. In addition to the new development flow additions, Task 1 pump station assessments will be used to update the model. Flows will then be added to the collection system based on the nearest existing system connection point and model analysis rerun for the existing system 2-year design storm and the future projected baseflow 2-year design storm. Flow capacity limitations, be it on the conveyance and/or pump station capacity side, will be reported under Task 4 – Technical Memorandum. Task 2 allows for 2 additional existing and future projected flow model runs (existing and future baseflows as recorded in the 2021 modeling report) evaluating how the new flow can be loaded to the existing system to optimize existing capacity. Based on an email from the City on April 13, 2022, one of those model scenarios will be investigating diverting flow from Thornton Drive to the Madd Branch Basin.



Mr. Chad Austin

October 10, 2023

Page 3

Task 3 – Capacity Analysis Tool Evaluation

This task involves holding a meeting with City staff to evaluate the future use of the Capacity Analysis Tool and the intended staff users and maintainers of the system. CDM Smith will also determine with City staff the current GIS licenses and software on hand. CDM Smith will develop options for the City and work with the City to choose the best option to maintain tool viability and success. Once an option is chosen, CDM Smith will develop a separate proposal scope and budget amendable to this Task Order.

Task 4 – Technical Memorandum

A Technical Memorandum (TM) summarizing the results of Tasks 1 and 2 will be completed. An alternatives analysis will be completed for pump stations if the pump stations do not meet anticipated capacity requirements. The TM will include a conceptual level Opinion of Probable Construction Costs (OPCC) for improvements identified in Tasks 1 and 2. OPCCs developed for the TM will be AACE Class 4. Conceptual design (15% Design Level) for all 10 facilities will be completed in order to perform the OPCCs. It is assumed that 5 of the pump stations will be unique and that 5 pump stations will be a typical design that can be scaled for their capacity. A Draft TM will be submitted for City comments. A review meeting to discuss comments will be held and comments will be incorporated into a Final TM.

Task 5 - Project Administration and Communications

This task involves project communications including invoicing and progress reports to be attached with the invoices. Conference calls will be used as needed for updates and coordination. An in-person Project kick-off meeting and TM review meeting are also anticipated.

Data Provided by the City

The City shall be responsible for, and Engineer may rely upon, the accuracy and completeness of all requirements, programs, instructions, reports, data, and other information furnished by the City to Engineer pursuant to the Agreement resulting from / attached to this proposal. Engineer may use such requirements, programs, instructions, reports, data, and information in performing or furnishing services under the Agreement. Engineer's scope of work does not include verifying the City Provided Information for accuracy or completeness. The City may request an independent review of the City Provided Information by Engineer pursuant to a mutually agreed amendment to this Agreement. Engineer shall be entitled to an adjustment in price and schedule to the extent that any corrective action in Engineer's Services arises out of inaccurate City Provided Information.

In the case where the Engineer's scope includes taking a preliminary or conceptual design that was prepared by another consultant for the City and further developing that design to the level



Mr. Chad Austin
October 10, 2023
Page 4

where it is appropriate to be issued for construction or bidding, Engineer shall not be responsible for latent errors or mistakes that are incorporated in that preliminary or conceptual design. Except where Engineer's scope explicitly includes a duty to validate or verify the preliminary or conceptual design or the underlying data and calculations, and then except only to the extent of the duty expressed in the scope, Engineer shall be entitled to rely on the preliminary or conceptual design as it appears in the documents provided by the City.

Schedule and Budget

CDM Smith proposes to complete the work for a lump sum fee of \$202,000. The estimated fees are shown in the Table below. The Task 5 services are distributed among other tasks. CDM Smith proposes to complete this project within 9 months of agreement authorization.

Task	Description	Estimated Cost
Task 1	Pump Station Assessments	\$73,700
Task 2	Modeling Analysis	\$38,200
Task 3	Capacity Analysis Tool Evaluation	\$21,100
Task 4	Technical Memorandum	\$69,000
	Budget Subtotal	\$202,000

On behalf of the entire CDM Smith organization, I want to express our appreciation for the opportunity to continue to work with the City. If you have any questions about this proposal, or any matter, please do not hesitate to contact me.

Very truly yours,

Daniel Unger, PE, PMP
Client Service Leader
CDM Smith