This scope of services is based on City Master Contract #4743/4744, dated June 20, 2024.

PHASE 1000 – 2026 HYDRAULIC MODELING SERVICES

This scope includes services related to the following activities

1. High Service Pressure Zone Calibration/Validation
2. Hillcrest/High Service reservoirs CIP Analysis.
3. Grid Improvements
4. On-Call Hydraulic Modeling Services

A. Task 1050 - Project Administration

1. Provide administration and management functions required to successfully complete the work including budget and schedule control, document control, coordination of activities, monthly invoicing, and project closeout. Maintain a change register of any scope changes affecting the project budget or schedule. Scope changes shall be discussed with SPRWS, and written approval will be received before proceeding.
2. Monthly progress meetings between SPRWS & BV Planning Engineer will be held to discuss progress.

B. Task 1100 – High Service Pressure Zone Calibration/Validation

1. Assess GIS data provided by SPRWS. Provide a field testing plan of hydrant pairs/sets and flow test forms to SPRWS for SPRWS to collect field data. Up to 20 hydrant pairs/sets are anticipated. Attend one hour meeting to discuss field testing approach prior to field activities. Meeting to include inspectors performing field testing.
2. Analyze the High Service pressure zone under static conditions to validate the boundary conditions in the model.
3. Perform a C-Factor calibration using the flow test results collected by SPRWS. Attend a one hour meeting to discuss calibration results.
4. Deliverables: Updated C-Factor table (SPRWS user's manual page 15), copy of hydraulic model with updated C-Factors, updated model scripts to assign cohorts & C-Factors.
5. Assumptions: SPRWS will supply the updated hydraulic model (if necessary) to be used in the assessment, SCADA data for the relevant pressure zones at the time of the flow tests. SPRWS will supply GIS data of the distribution system indicating changes made in construction year 2025. This will comprise of either the GIS distribution data OR project area footprints & project description including pipe diameters & materials. SPRWS is responsible for performing the field testing. B&V will not perform a model update to 2025 GIS data as part of this task. The GIS data will be referenced to ensure testing locations are not

impacted by new construction, and to make minor adjustments to ensure overall model operations represent real world conditions.

6. Schedule: Field testing plan to be delivered by March 2026. SPRWS to conduct field testing April 2026 prior to widespread water main construction. Calibration to be complete by September 2026.

C. Task 1200 – Hillcrest/High Service Reservoirs CIP Analysis.

1. Establish boundary conditions of analysis. Attend a two hour meeting to define base year of analysis, assumptions of current/future demand and regional expansions, known water main transmission and facility upgrades to be included in analysis, and performance criteria of SPRWS assets (velocities, pressures, reservoir levels, water age). Meeting to occur April 2026.
2. Update hydraulic model based on defined boundary conditions. One future year model scenario to be developed based on boundary conditions & Met Council 2050 demand projections.
3. Perform analysis to identify deficiencies in SPRWS High Service pressure zone large diameter transmission mains (>=16”). Specific attention given to transmission to Hillcrest Reservoir, and resultant HGL at Hillcrest Reservoir relative to Dale Street Reservoir and Highland Reservoir 2.
4. Use hydraulic model to propose Capital Improvement Plan (CIP) resolutions to identified deficiencies. Expected CIP projects will include water main transmission projects and/or piping/valving modifications at reservoirs. Attend a one hour meeting to discuss modeling results.
5. Provide technical memorandum summarizing findings, including high level cost estimate.
6. Assumptions: SPRWS will supply the updated hydraulic model (if necessary) to be used in the assessment, SCADA data for the relevant pressure zones for two years. SPRWS will supply GIS data of the distribution system indicating changes made in construction year 2025, and information for any known future CIP transmission project in the High Service pressure zone.
7. Schedule: This task is planned to be completed by October 2026.

D. Task 1300 – Grid Improvements

1. Analize up to 10 Grid Improvement locations, such as an additional river crossing, or redundant main to Mailand BPS. Each location will be analyzed in a base year scenario to identify project benefits, and in one future year scenario to ensure adequate sizing. Analysis will use performance criteria, and future year scenario established in Task 1200 to quantify effectiveness of grid improvements.
2. Provide technical memorandum summarizing findings. If all grid improvement projects are not initially known, a draft memorandum will be provided to SPRWS. Additional grid analysis projects will be added to the Draft until all locations are analyzed.
3. Schedule: Analysis to be completed after Future Year scenario developed as part

of Task 1200. Analysis of initial known grid improvements to be completed by September 2026. Additional locations to be completed as requested.

E. Task 1400 – On Call Services Support

1. Provide SPRWS on-call hydraulic modeling services and support. Anticipated activities may include supporting the annual update to the hydraulic model, analysis related to the selection and performance of water main CIP projects, validation activities, software implementation, and analysis of system operation changes. SPRWS may consider additional activities to the above tasks that the on-call services could be used to perform such as updating SPRWS's scripts to apply new C-Factors to SPRWS Hydraulic Model, including new St. Anthony and Roselawn C-Factors, and 1-2 meetings to provide SPRWS staff knowledge of calibration process. 40-hours of on-call work has been budgeted.

COMPENSATION

For the engineering services authorized by this agreement, the City agrees to pay Black & Veatch on the basis of hourly billing rates for actual hours spent plus direct reimbursement for expenses; not to exceed a maximum billing limit of $50,000. Invoices shall be submitted monthly for services performed during preceding month. Any services exceeding the maximum billing limit or outside the defined scope shall require written authorization prior to execution, with an amended billing limit established as necessary.

Task	Cost
Task 1050: Project Administration - Monthly Meetings, PM & Overhead	$8,170
Task 1100: High Service Pressure Zone Calibration/Validation	$15,360
Task 1200: Hillcrest/High Service Reservoir CIP Analysis	$12,400
Task 1300: Grid Improvements	$6,670
Task 1400: On-Call Services - 40 Hours	$7,400
Total	**$50,000**