resourceful. naturally.
engineering and environmental consultants

BARR

September 15, 2020

Mr. Jon Haukaas
Director of Public Works
Engineering Department, City of Blaine
10801 Town Square Drive NE
Blaine, MN 55449

Re: Proposal for WTP1-3 Upgrades

Dear Mr. Haukaas:

Barr Engineering Co. and CBS Squared, our architectural partner for this project, appreciate the opportunity to submit a proposal to provide continued engineering services within your water treatment facilities. This proposal provides for evaluation of miscellaneous upgrades at the City of Blaine's Water Treatment Plants (WTPs) 1, 2, and 3 to address facility maintenance issues at the sites. It is also set up to provide you with a baseline asset management plan type assessment of each plant.

Project understanding

The three plants were constructed between 2005 and 2007 and all feature similar treatment processes. During a pre-proposal tour, many areas of corrosion and other cosmetic defects were noted. These issues are believed to have been accelerated by poor ventilation in the facilities, which resulted in chlorine gas corrosion in some areas of the facilities. In an earlier project, each facility was evaluated by Barr for ventilation upgrades to address the root cause of the corrosion. The ventilation upgrades have been implemented. This proposal will result in identification of what elements in each plant should be repaired, replaced or upgraded to bring the plant up to an acceptable condition. The actual preparation of plans and specifications needed to will occur under a subsequent project.

Proposed scope of work

Details of the scope of work we will perform to meet the objectives listed above are included below.

Task 1: Condition Assessment and 2021 WTP 1-3 Upgrades

Task 1 will be divided into two phases:

- *Phase 1: Condition Assessment* is included in this proposal.
- *Phase 2: Design of Upgrades* will be included in a future proposal after the City of Blaine has developed a scope based on information presented in the condition assessment.

Objective: Determine the condition of each water treatment plant and its individual components, and identify those elements that need rehabilitation or replacement.

Phase 1: Barr, CBS Squared, and City staff will make site visits to assess the existing conditions of facilities at each plant. CBS Squared will perform an onsite existing conditions assessment of interior and exterior architectural components of the City of Blaine's three WTP buildings. The inspection data provided following the assessment will include condition of each component, useful life remaining, and recommended action (e.g., clean, paint, and replace). Inspection will include the fire suppression system. The data will be provided in a to-be-determined Excel spreadsheet that the City can import into their asset management system, PubWorks.

During the site visits Barr will inspect interior water treatment process piping, equipment, chemical addition systems, backwash systems and electrical components. The inspection will exclude HVAC components (which have been recently replaced), and cameras (to be replaced via a separate project). However, even these recently replaced components will be given an asset management grade for setting baseline total plant condition. The exterior inspection will be limited to doors and windows, including hardware, building masonry, rain gutters and downspouts, pavement and slabs adjacent to the building, and the roof of the WTP 3 building.

Following the site visits, a technical memo recording observations and assessing the condition of facilities in each plant will be prepared. The condition assessment will be prepared using a grading system and terminology compatible with Pub Works, the City's existing asset management software. The condition assessment will include recommendations for work to be included in the 2021 WTP 1-3 upgrades project. We expect the potential scope of work identified during the condition assessment for Phase 2 will include coatings, casements, hardware, lighting, and electrical systems.

Phase 2: Design will be completed on upgrades identified by our team and agreed to by the City as a part of Phase 1. This work is not included in this proposal but will be added following confirmation of the appropriate scope by the City.

Task 1 meetings

- Kickoff meeting held at Blaine Public Works or City Hall, attended by four Barr/CBS^2 staff.
- Site visits to WTP 1, 2, and 3 to evaluate architectural, structural, process, mechanical, and electrical systems. Full assessments will take up to two days per plant depending on confined space entry inspections and building accessibility.
- Draft memo review meeting with City.
- Meet with City to confirm scope of Phase 2.

Task 1 deliverables

- Condition Assessment memo for each WTP.
- Each memo will include recommendations for a scope of work to be included in a Winter 2021 project to address corrosion and cosmetic issues at each facility. This task will not include final design for these improvements.
- Scope of work and fee proposal for completion of Phase 2 design work.

Task 1 work by City

- City will provide full sets of record drawings for each WTP prior to the site visits.
- City will provide access to the three water treatment plants.
- City will de-energize electrical equipment as appropriate for detailed inspection of those components.
- Backwash storage tanks will be drained to allow access. Barr will provide all permit-required confined-space-entry equipment.

Task 2: Chlorine Disinfection Feasibility Study

Objective: determine what method of potable water disinfection is in the city's best interests in the long term for each water treatment plant.

This task includes a feasibility study comparing alternatives for chlorine disinfection. The alternatives considered will include:

- Maintaining the existing large-cylinder gas chlorine disinfection system.
- Replacement of the existing system with bulk-liquid hypochlorite.
- Replacement of the existing system using on-site generation of hypochlorite.

Task 2 meetings

- Initial condition assessment meeting that is part of Task 1 identified above.
- Draft memo review meeting with City.

Task 2 deliverables

- Feasibility memo for each WTP.
- Each memo will include:
    - Estimate of remaining service life for the existing system.
    - Comparison of capital costs, O&M costs, and replacement costs for each alternative.
    - Comparison of health and safety issues for each alternative.
    - Comparison of system reliability for each alternative.
    - A scope of work for a future project at each facility based on the study outcome. This task will not include final design for these improvements.

Task 2 work by City

- City will provide shop drawings of the existing chlorine systems.
- City will provide access to the three water treatment plants.

Task 3: Automatic Valve Feasibility Study

Objective: determine if the existing filter control valves are adequate for continued use or should be replaced by new valves with more sophisticated operation and position indication.

This task includes a feasibility study comparing alternatives for upgrade of existing automatic valves. The alternatives considered will include:

- Maintaining the existing pneumatically actuated valves.
- Maintaining existing pneumatically actuated valves and add valve position switches.
- Replacing existing pneumatic valves with electrically actuated valves with position switches.
- Maintaining the existing hydraulically actuated, flow control valves.
- Replacing the existing hydraulic actuated valves with electrically actuated, flow control valves.

Task 3 meetings

- Initial condition assessment meeting that is part of Task 1 identified above.
- Draft memo review meeting with City

Task 3 deliverables

- Feasibility memo for each WTP.
- Each memo will include:
    - Estimate of remaining service life for the existing system.
    - Comparison of capital costs, O&M costs, and replacement costs for each alternative.
    - Comparison of system reliability for each alternative.
    - A scope of work for a future project at each facility based on the study outcome. This task will not include final design for these improvements.

Task 3 work by City

- City will provide shop drawings of the existing filtration and filter control systems.
- City will provide access to the three water treatment plants.

Task 4: Flow Meter Feasibility Study

Objective: determine if all plant flow meters at each facility should be changed out in favor of electromagnetic flow meters.

This task includes a feasibility study comparing alternatives for replacement of existing flow meters. The alternatives considered will include:

- Maintaining the existing propeller meters.
- Replacing existing meters with electromagnetic flow meters.

Task 4 meetings

- Initial condition assessment meeting that is part of Task 1 identified above.
- Draft memo review meeting with City

Task 4 deliverables

- Feasibility memo for each WTP.
- Each memo will include:
    - Estimate of remaining service life for the existing meters.

- Comparison of capital costs, O&M costs, and replacement costs for each alternative.
- Comparison of system reliability for each alternative.
- A scope of work for a future project at each facility based on the study outcome. This task will not include final design for these improvements.

Task 4 work by City

- City will provide shop drawings of the existing flow meters.
- City will provide access to the three water treatment plants.

Task 5: Dehumidifier Feasibility Study

Objective: determine if the existing method of plant dehumidification is appropriate or if replacement with a new method is in the city's be interest in the long term.

This task includes a feasibility study comparing alternatives for replacement of the existing dehumidification system. The alternatives considered will include:

- Replacing the existing system in kind (desiccant based system).
- Replacing the existing system with an alternate product (refrigerant based system).

Task 5 meetings

- Initial condition assessment meeting that is part of Task 1 identified above.
- Draft memo review meeting with City

Task 5 deliverables

- Feasibility memo for each WTP.
- Each memo will include:
  - Estimate of remaining service life for the existing equipment.
  - Comparison of capital costs, O&M costs, and replacement costs for each alternative.
  - Comparison of system reliability for each alternative.
  - A scope of work for a future project at each facility based on the study outcome. This task will not include final design for these improvements.

Task 5 work by City

- City will provide shop drawings of the existing dehumidifiers.
- City will provide access to the three water treatment plants.

Task 6: Backwash Reclaim Feasibility Study

Objective: identify methods to improve backwash water recovery and limit discharge to sanitary sewer.

This task includes a feasibility study comparing alternatives for improving the performance of the existing backwash reclaim system at each of the water treatment plants. The alternatives considered will include:

- Maintaining the existing system with modifications to operating conditions.

- Chemical addition methods to improve settling of backwash.
- Physical improvements to the backwash tanks to improve settling (IE adding plates or baffles)
- Complete system replacement with a lamella type backwash reclamation system.

Task 6 meetings

- Initial condition assessment meeting that is part of Task 1 identified above.
- Draft memo review meeting with City.

Task 6 deliverables

- Feasibility memo for each WTP.
- Each memo will include:
    - Estimate of remaining service life for the existing equipment.
    - Comparison of capital costs, O&M costs, and replacement costs for each alternative.
    - Comparison of system reliability for each alternative.
    - A scope of work for a future project at each facility based on the study outcome. This task will not include final design for these improvements.

Task 6 work by City

- City will provide access to the three water treatment plants.
- Backwash tanks will be drained for detailed inspection.
- City will make plant to have the plants taken off line as appropriate to facilitate the inspections.

Project management

Project management will involve project updates and correspondence with City staff and the project team at frequency requested by City staff.

Personnel availability

The Barr team committed to this project include staff with whom you are familiar, and will consist of:

- **Brian LeMon**—principal in charge and QA/QC and project manager for inspection phase
- **Katie Duncan**—project manager for feasibility study phase
- **Beth Engum and Chad Oster (CBS Squared)**—architects
- **Mark Ziemer**—electrical engineering
- **Process and tank inspection staff** – other Barr staff as appropriate for inspection of chemical addition, backwash, and process piping and equipment.

Project schedule

The proposed project schedule is provided in the following table.

Work task	Deliverable date
City Council approval of Phase 1	September 21, 2020
Task 1: Phase 1	
Kickoff meeting and WTP 1-3 site visits	Week of September 21
Draft Task 1 memo	October 7
Meet with City to finalize Phase 2 scope	October 9
Submit proposal for Phase 2	October 15
City Council approval of Phase 2	October 19
Task 1: Phase 2 (not in this scope)	
Submit 60% plans and estimate	November 24
Submit 90% plans, specs, and estimate	December 17
City Council authorization to advertise bids	December 21
Submit issued for bids plans and specs	December 23
Receive bids	January 26, 2021
City Council award contract for upgrades	February 1
Task 2, 3, 4, 5, and 6	
Draft memos	Early 2021 as scheduled with City

Fee estimate

Work will be performed on a time-and-materials basis for the estimated amount shown below. If—during the execution of the work—it appears costs will be exceeded, we will notify you before exceeding the amount shown below. The fee for each task can also be negotiated based on the final work scope.

Work task	Fee estimate
Task 1: Phase 1	$25,700
Task 1: Phase 2	To be determined
Task 2: Chlorine disinfection feasibility study	$9,100
Task 3: Automatic valve feasibility study	$8,400
Task 4: Flow meter feasibility study	$3,800
Task 5: Dehumidification feasibility study	$3,800
Task 6: Backwash reclaim feasibility study	$12,800
Total estimated fee	**$63,600**

This scope of work will be performed according to the terms of the master service agreement between Barr and the City. If the terms of this proposal are acceptable to the City of Blaine, please date and sign in the space provided below. Keep one copy for your records and return the other to Barr Engineering Co.

Thank you for the opportunity to propose on this project. If you have questions about our team's proposal scope or budget, feel free contact Brian LeMon (952-832-2774 or blemon@barr.com) or Katie Duncan (952-842-3654 or kduncan@barr.com).

Sincerely,

By: Brian LeMon, PE
Its: Vice President, Principal in Charge

Katie Duncan, EIT
Project Manager

Accepted this ___ day of _____, 2020

CITY OF BLAINE

By_____

Its_____