

SUBJECT

BOARD RESOLUTION NO. 19-83

Pertaining to an agreement with EN Engineering, LLC to provide professional services for external corrosion assessment of the steel segments of the 1924 raw water conduit (M1) between the Board's Fridley pump station and Lake Charley.

BACKGROUND INFORMATION

Staff is seeking approval of an agreement with EN Engineering, LLC, in an amount not to exceed \$89,500, to complete an external corrosion assessment on the steel segments of conduit M1 for the purpose of determining the extent of deterioration. The data collected will be used by SPRWS to hire a consultant in a follow-up project to design a cathodic protection system that will slow deterioration and extend the life of the conduit.

Following Board approval, City Contracts and Analysis will prepare and execute an Agreement, which will include the City's standard terms and conditions, liability and insurance language, and the following:

Scope of Work:

1. Complete a modified External Corrosion Direct Assessment Survey (ECDA):
 - i. Conduit pre-assessment
 - ii. Indirect inspection
 - iii. Direct examination
 - iv. Post assessment
 - v. ECDA Records
2. Close Interval Potential Survey
3. Coating Assessment Survey
4. Pipe Depth Survey
5. Based upon assessment results, provide approximate costs for design and construction of a cathodic protection system for the M1 steel conduit segments.

The work is further detailed in the attached November 14, 2018 Proposal.

Cost: Not to exceed \$89,500

Term: January 1, 2019 - December 31, 2019

See attached EN Engineering, LLC Proposal.

RECOMMENDATION

Board approval is recommended.

REPORT

Mississippi River Conduit M1 – Steel Segments External Corrosion Assessment

December 20, 2018

In 2017, AECOM completed a large-scale condition assessment of the steel and concrete raw water conduits that transport water from the Mississippi River, through our network of lakes north of Saint Paul, and eventually on to the treatment plant. AECOM was able to perform internal inspection on most of the conduits and detailed their findings. Most of the repair work needed is on the concrete segments of conduit, but there were also conditions to be addressed on the steel segments of conduit. Of the length of those raw water supply conduits, 73,000 feet, or almost 14 miles, is made of welded or riveted steel.

In 1971, a corrosion assessment was done on the steel conduit segments by a company called Harco Corporation. At the time, design and installation of a cathodic protection system was their recommended path forward. They developed a design based on the conditions at that time, however, no system was ever installed.

Given the importance of the supply conduits to our operations, and the high cost of full conduit replacement, determining a cathodic protection system that will greatly extend the life of the existing steel conduits is in our best interests.

AECOM's estimated cost to perform the external corrosion assessment program on all the steel conduit segments is \$1.5 million. With our \$190,000 budget limit in mind for this current Board approval request, we intend to assess only the steel segments in the conduit between the Mississippi River pump station and Lake Charley/Pleasant Lake, which is our oldest steel segments of the supply conduits. We intend to assess the remaining steel conduits in future years assuming there are positive results from this first assessment program.

The current work requested of EN Engineering will include:

1. Complete a modified External Corrosion Direct Assessment Survey (ECDA). This is an assessment program developed by the worldwide organization recognized as the authority on corrosion control, National Association of Corrosion Engineers (NACE). The process is broken down into five categories that should provide a clear understanding of the current condition of the conduits. Those categories are:
 - a. Pre-Assessment
 - b. Indirect Inspection
 - c. Direct Examination
 - d. Post Assessment
 - e. ECDA Records
2. Close Interval Potential Survey – The survey is conducted along the length of the conduit by taking electrical conductivity readings of the surrounding soil.
3. Coating Assessment Survey – Done by excavating various locations of the conduit and visually inspecting the exterior coating condition.

4. Pipe Depth Survey – Done by standard excavating or vacuum excavating along the top of the conduit to measure its depth. The proposed method of completing the ECDA survey will result in minimal excavation work.
5. Development of approximate costs for both the design and installation of one or more cathodic protection methods for long term conduit protection.

We have reviewed EN Engineering's proposal and believe they are fully knowledgeable on the techniques and methods needed to develop the pilot program described in their report. Our goal is to complete the contract award process by February 2019, commence with the corrosion assessment program of the M1 steel conduit segments during the spring and summer of 2019, and have a finalized report by the end of the year.