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TO: Chairperson Greg Dannecker and Members of the Utilities Committee

FROM: Chris Shaw, Utilities Director

DATE: May 3, 2017

RE: ***Award the 2017 AWWTP Improvements Project Engineering Phase to Donohue in the amount of $228,464 with a 15% contingency of $ 34,270 for a Project Total not to exceed $262,734***

BACKGROUND:

The Appleton Wastewater Treatment Plant (AWWTP) has four capital projects that have been identified in the 2017 budget. The projects have been bundled into a single project in order to reduce engineering and construction costs. Of the four projects, the first project is a pumping system that has reached its useful life. The second project is the replacement of a nonfunctional positive displacement blower with an energy efficient turbine. The third project is the introduction of a final effluent pump that will allow the AWWTP to pump at a firm capacity of 102 million gallons per day (MGD). The fourth project is the introduction of a glycol cooling system for the plant anaerobic digester gas mix compressors. The projects are more fully defined below:

1. WAS Pump System Replacement: The AWWTP utilizes an "activated sludge" type of secondary treatment. This process utilizes microorganisms to metabolize wastes. The inventory of organisms can be greater than 100,000 pounds. As part of the activated sludge process, a percentage of the organisms must be removed. This is accomplished continuously with a waste activated sludge (WAS) pump system. The three existing Allis Chalmers WAS pumps have performed well for the past 38 years, however, replacement parts are not available. The pumps have reached their useful life. It should be noted that there are currently two operable pumps.

2. High Pressure Blower Replacement: The AWWTP utilizes large capacity air blowers to deliver oxygen to the plant microlife. The aeration system has an inventory of 80,000-120,000 pounds of microlife that treat wastewater. There are four blowers in the aeration process that can deliver air to the online aeration. Of the blowers, Blower #3 was placed into service in 1992. This 700 horsepower positive displacement blower is currently not operational because it is in need of repair to the electrical variable speed equipment. Due to advances in aeration blower technology, the unit is not efficient enough to consider repairs and replacement is warranted. This was a similar conclusion to the one reached by Focus on Energy for the replacement of the

Blower #2 in 2009. The replacement blower will be capable of introducing enough air into the liquid that it can support microlife in the five million gallon volume aeration tanks. The new blower will be linked to existing dissolved oxygen (DO) sensors in the tank. Data from the tanks will be read by a programmable logic controller that will drive the process. The control loop shall allow motors to run based on biological demand rather than a fixed setting.

3. Additional Final Effluent Pump: The wastewater treatment plant has a 102 million gallons per day (MGD) pump capacity. During wet weather events, infiltration and inflow (I&I) affects the wastewater collection system. As a result, the wastewater treatment plant must treat both the sanitary sewer and I&I flows. There have been multiple wet weather events that have pushed the treatment facility to pump at and above 102 MGD. To provide firm effluent pumping capabilities of 102 MGD at high flow conditions, it necessary to further improve the effluent pump station #1 pumping capacity. Firm pumping capacity of 102 MGD requires that one pump or more pumps capable (e.g. submersible or screw) of a 25 MGD flow rate be added. By adding the additional pumping capabilities at effluent pumping station #1 this requirement would be met.

4. The elevated temperatures generated by gas compression (approximately 350^{o}F) require cooling to protect equipment. Reclaimed final effluent (RFE) has been the chosen media to cool gas and gas mix equipment for the past 15 years because it has virtually no cost outside of electrical for pumping. However, RFE use for these purposes has shortcomings primarily because it contains a small fraction of solids and nutrients. For this application these materials are considered "contaminants". The gradual formation and accumulation of biofilm within the head of the gas compressor cooling jacket is a principal drawback of RFE use. This accumulation of solids plugs the compressor cooling jacket which increases equipment temperature and in turn causes premature wear of rotating components and also contributes to accelerated degradation of gasket material leading to eventual failure of the compressor(s). The AWWTP currently budgets $15,000 each year for the replacement of one gas compressor. Installation of a closed loop glycol cooling system will aid in extending the life of the gas compressors while increasing system reliability and continuity of operation.

RFP PROCESS

Four engineering firms were solicited for professional services for this project. A request for proposals (RFP) was developed by Utility Department staff. Proposing firms were required to deliver the following minimum project elements:

- Conditions Assessment and Project Alternatives Report
- Preparation of Bidding Documents
- Obtain WDNR Regulatory Approvals
- Contract Administration Services
- Contract Management Services
- Revise AWWTP Operations and Maintenance Manuals

QUOTE RESULTS:

The Utility organized a multidisciplinary team to critically evaluate each firm's written proposal based on established weighted criteria described in the RFP.. Each proposal was then given a score by team members based on content and independent of costs. Sealed fees were revealed following the tally of each team member scores. The sum of the teams' scores are identified in the table below. The table also identifies the engineering firms' costs, proposal scores and the final value scores which were used to rank the proposals in order of preference. The higher the final value score, the greater the value of the proposal.

COMPANY	QUOTE	PROPOSAL SCORE	FINAL VALUE SCORE
CH2M Hill	DNP	NA	NA
Donohue	$228,464	299	131
McMahon Associates	$455,537	267	59
Strand Associates	$350,900	184	52

The proposal received from Donohue was the least cost proposal. Furthermore, Donohue had received the highest proposal score from the evaluation team. The preceding factors led Donohue to have the highest final value score.

FUNDING SOURCE:

The funding source for these projects can be found in the 2017 Wastewater Utility Capital Program. The utility had identified $277,500 for engineering services for this project.

RECOMMENDATION:

I recommend award of the 2017 AWWTP Improvements Project Engineering Phase to Donohue in the amount of $228,464 with a 15% contingency of $34,270 for a Project Total not to exceed $262,733

If you have any questions regarding this project please contact Chris Shaw at ph: 832-5945