

ITEM#: 9
DATE: 10-11-22

COUNCIL ACTION FORM

SUBJECT: SPONSORED RESEARCH AGREEMENT WITH IOWA STATE UNIVERSITY

BACKGROUND:

During the COVID-19 pandemic, Water Plant staff was continuously dealing with disruptions in the supply of carbon dioxide (CO₂). One creative measure staff investigated was the use of a “split treatment” operational scheme. Under this scheme, a portion of the raw well water bypasses the lime softening process. When recombined with the high pH softened water, the bypassed water helps to drop the pH, thereby reducing the amount of CO₂ required to adjust the pH.

To evaluate the feasibility of the process, staff entered into a sponsored research agreement with Iowa State University (\$21,127). A Water Plant student operator, Matthew Jacob, was in a graduate environmental engineering program. The agreement with ISU was for Matthew to initially perform bench-scale testing. When the results indicated that split treatment could be a viable treatment method, Matthew initiated full-scale testing. The tests were very successful in achieving the treatment targets of the Water Plant with substantially lowered chemical feed rates. (As an aside, a few months after graduation, Matthew applied for an open Environmental Engineer position with the Water & Pollution Control Department and has been a part of our full-time staff since March.)

A second phase of the study is now proposed. This additional work will look specifically at the virus loading potential under the split treatment operational scheme. Staff believes this is an exceedingly small concern, but it was an issue raised by the Iowa Department of Natural Resources (DNR) during the permitting of the new treatment plant. The question is something that needs to be documented before the Iowa DNR will approve a construction permit to adapt the treatment facility to continuously operate in a split treatment mode. **Additionally, this phase will investigate the impacts on down-stream valves and equipment due to the altered water chemistry at the point where the bypassed flow is recombined with the softened water.** The work will be performed by another student operator enrolled in a graduate Environmental Engineering program, Nicole Martindale.

The dollar amount for the additional work is \$29,232. Since the proposal by Iowa State is a continuation of the original work, the combined dollar amount of both studies, at \$50,359, requires Council authorization. If the results are found acceptable by the Iowa DNR, the reduction in operating expenses could be well over \$100,000 per year in reduced CO₂ and lime usage and a reduction in the

volume of lime sludge produced – all while achieving the same finished water chemistry.

ALTERNATIVES:

1. Approve the Sponsored Research Agreement between Iowa State University and the City of Ames, Amendment #1 Revised, in the amount of \$29,232.
2. Do not approve the agreement at this time and give staff direction on whether to continue to pursue the split treatment scheme.

CITY MANAGER'S RECOMMENDED ACTION:

The adoption of the split treatment scheme has the potential to reduce chemical use without lowering the finished drinking water quality provided to the community. The reduced chemical usage has the potential to reduce operational expenses by more than \$100,000 per year. The reduction in chemical use has the added benefit of lowering the carbon footprint of the treatment process by reducing the number of delivery truck loads. Answering the virus loading question as well as identify the potential for any fouling of equipment at and downstream of the recombined flow is an important next step to adopting split treatment on a permanent basis. Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, as described above.