

MEMORANDUM

DATE: December 29, 2015

TO: William Stowe, CEO and General Manager
Ted Corrigan, COO and Director of Water Distribution

FROM: Dan Klopfer, P.E., Engineering Services Manager
Nathan Casey, P.E., Project Manager

SUBJECT: Pilot Wetland for Nitrate Treatment

In 2015, Des Moines Water Works was forced to operate Nitrate Removal Facility for a record setting 177 days. Evaluation of raw water trends indicate that the average nitrate concentration is continuing to increase. For this reason, additional low nitrate water sources or additional nitrate treatment may be needed at the Fleur Drive and McMullen Water Treatment Plants within the next few years. Staff, with the assistance of CH2M, is developing a comprehensive plan to increase the nitrate treatment capacity at the treatment plants.

The Fleur Drive Treatment Plant is projected to need as much as 9 million gallons per day (mgd) of additional nitrate treatment capacity by the year 2020 and 19 mgd by 2035. In order to meet this need, a multi-faceted plan using both natural treatment processes and new water treatment technology is being prepared. Part of this plan includes converting a portion of Water Works Park into an “intensified” wetland for pre-treatment of nitrate prior to the plant. Water will be pumped out of the Raccoon River and travel through a surface flow wetland, with occasional carbon feed, to allow natural denitrification to take place.

Because this type of wetland is not typically used for drinking water treatment, a one acre pilot is being proposed. This pilot will focus on answering key questions such as size of wetland needed, rate of denitrification, carbon addition, temperature dependence, other pollutants of concern, and reaction to flooding. The pilot will include two parallel half-acre wetlands to enable the full range of treatment approaches.

Staff is proposing an agreement with CH2M for \$155,942 for pilot design, planting approach, sampling plan, and data analysis. Cost for construction of the pilot was originally estimated to be \$350,000. In order to reduce construction costs, the pilot will be constructed and operated by Des Moines Water Works staff.