

MEMORANDUM

DATE: September 23, 2019

TO: Ted Corrigan, P.E., CEO and General Manager

FROM: Mike McCurnin, P.E., Engineering Services Manager
Vern Rash, P.E., L.S., Project Manager

SUBJECT: Des Moines River Well Field Update

On September 26, 2017, the Board of Water Works Trustees received and filed the “DMWW Long Range Plan 2017,” prepared by HDR Engineering, Inc. One of the major findings of the “DMWW Long Range Plan 2017” included using the existing Des Moines River Pump Station at Prospect Park to convey alluvial groundwater water to the Fleur Drive Water Treatment Plant. Developing the Des Moines River alluvial aquifer as an additional water supply has the potential to reduce disinfection by-product formation, reduce ammonia concentrations and assist with nitrate management in source waters.

The DMWW Long Range Plan 2017 report proposed that design and construction of improvements necessary to develop the Des Moines River alluvium as an additional raw water supply for the Fleur Drive Water Treatment Plant start in 2019. Prior to the start of design, a hydrogeological study is needed to better understand the availability and quality of the alluvial and groundwater resources at the site.

On December 19, 2018, the Board of Water Works Trustees authorized staff to execute a Joint Funding Agreement with the U. S. Geological Survey Illinois-Iowa Water Science Center (ILIAWSC). This scope of this Joint Funding Agreement was to conduct a series of cooperative scientific investigations that would evaluate the quality and availability of alluvial groundwater along the Des Moines River between Interstate 80 and Interstate 235. The primary objectives of these scientific investigations include:

1. Establishing a hydrogeologic framework using new and existing field data to better understand the physical and chemical nature of the groundwater in the Des Moines River valley alluvial aquifer.
2. Developing a groundwater flow model for the Des Moines River valley alluvial aquifer to better understand the effects of pumping water in the study area and optimize management of the Des Moines River valley alluvial aquifer.
3. Identify possible locations of a system of one or more radial collector wells that would collect the alluvial groundwater from the Des Moines River valley alluvial aquifer.

Collecting alluvial groundwater with radial collector wells allows use of a collection method referred to as “riverbank filtration.” Riverbank filtration is a process that induces water to infiltrate into local groundwater aquifers from a surface water source when favorable hydro-geologic conditions exist near rivers and streams.

This natural filtration obtained by riverbank filtration offers numerous benefits to the Des Moines Water Works in terms of raw water quality. These benefits include:

1. Cost efficient removal of particles and waterborne pathogens, such as *Giardia* and *Cryptosporidium*, than many conventional treatment processes.
2. Reduced turbidity of the raw water that lessens the need to use pre-sedimentation to remove suspended soil, silt, and sand particles prior to lime softening.
3. Partial removal of organic matter including disinfection byproduct precursors by biodegradation and physical removal at the river/aquifer interface.
4. Reduced nitrate concentrations that assist with nitrate management in the finished water.
5. Removal of algae that can clog filters and reduce filter efficiency.
6. Removal of the algal toxin microcystin.
7. Partial removal of, or nearly complete removal of some, herbicides, pesticides, pharmaceuticals, and personal care products.
8. Higher water temperatures in the winter months that improves efficiency of the treatment processes. Warmer water temperatures can also lower the number of water main breaks that occur during winter months due to the colder water temperatures of surface water supplies.

Engineering Department staff will make a presentation at the October 1, 2019 Board Planning Committee meeting reporting on the status of the Des Moines River Well Field Study.

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