



Date: April 25, 2017  
To: Water Utility Board  
From: Al Larson, PE, BCEE  
Kelly Miess, PE  
Re: **Request to Advertise for Engineering Design Proposals**  
Project: **Unit Well 19 Iron & Manganese Filter Addition**

### General Scope

Madison Water Utility (MWU) is seeking to advertise for proposals from interested, qualified firms to provide professional engineering services for the design and construction of a new iron and manganese filtration system for Unit Well 19.

Unit Well 19 is located on an easement on University of Wisconsin-Madison property near Picnic Point and immediately east of the University's Eagle Heights student housing complex. Well 19 is in Pressure Zone 6-West, the large pressure zone that extends west from the Yahara River, south to the City of Fitchburg border and west to southwestern shores of Lake Mendota. The well is a critical supply point for the University, MWU's largest customer, and provides a significant percentage of the Zone 6-West water supply.

### Background

Unit Well 19 was constructed in 1974 and consists of the deep well and pump, booster pumps and a 3-million gallon ground-level reservoir. MGE has a standby generator on the site. The well is run year-round and pumps 500 to 700 million gallons annually. The most recent Infrastructure Management Plan assessment found the facility in good working condition but noted an issue with poor secondary water quality.

Recent water quality testing confirms the poor secondary water quality. The iron and manganese levels from the well are consistently 0.2 mg/L and 45-50 µg/L respectively. The secondary Maximum Contaminant Level (MCL) for iron and manganese are 0.3 mg/L and 50 µg/L. Per Water Utility Board Procedural Guidelines for water quality treatment, if a contaminant consistently exceeds 80% of the secondary MCL's, action to reduce the contaminant level is triggered. Currently, manganese is at 90-100% and iron at 67% of their secondary MCL's.

Madison Water Utility has had very good success with iron and manganese filtration. MWU commissioned its first iron and manganese filter at Well 29 in early 2009. Well 29 has produced over 550 million gallons per year of high quality water since the filter installation. A second filter was installed at Well 7 in 2015 and it has produced approximately 270 million gallons per year since it was put into operation. The Utility is currently ramping up water production from Well 7 to take advantage of the iron

and manganese filtration system. A filtration system was also designed for Well 31 which will be installed with the 2017-2018 construction of that facility.

The water quality from filtration is excellent, with iron and manganese levels reduced over 90% to well below the secondary MCL's. A January 2017 Memorandum to the Board regarding iron and manganese filtration treatment costs found the cost of adding filtration to be \$0.32 per 1,000 gallons of water sold. At the January 31<sup>st</sup> Water Board meeting, the Board reaffirmed the board's water quality policy regarding inorganic compounds with a secondary MCL's. Given the critical importance of Well 19 to the MWU supply and distribution system, we recommend installing an iron and manganese filtration system at Well 19 and request permission to advertise for engineering consulting services for its design and construction.

### Staff Availability

MWU Engineering staff does not have the expertise in iron and manganese filtration system project development and design required to complete this project. MWU will work closely with the selected consultant to ensure project objectives are met.

### Estimated Cost

The total design and construction project budget for the project is estimated at approximately **\$4.1 million**, distributed as follows:

#### Consultant Services

- Consultant Engineering Services: \$466,000
- Facility Construction: \$3,600,000

Total Estimated Project Cost: \$4,066,000

### Project and MWU Mission

This project proposes to mitigate water quality deficiencies in a critical water supply facility in alignment with Water Board policies to take action to correct those deficiencies. Meeting these objectives supports MWU's core mission to provide water to customers for consumption and fire protection, and helps MWU achieve its goals for adequate water quality and quantity, operational optimization and reliability.