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**Madison  
Water  
Utility**



www.madisonwater.org • 119 East Olin Avenue • Madison, WI 53713-1431 • TEL 608.266.4651 • FAX 608.266.4426

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October 31, 2022

## **Letter of Intent: City of Madison Land Use Application Unit Well 19 Treatment System Addition**

**Site Location:** 2526 Lake Mendota Drive

### **Project Description**

This project focuses on the removal of three naturally-occurring contaminants at Madison Water Utility's Unit Well 19: iron, manganese and radium. All three of these contaminants are near or above 80% of their federally regulated maximum contaminant levels. When the 80% threshold of federal levels is exceeded, Madison Water Utility Board policy requires action to reduce contaminant levels. Iron and manganese are considered by the Environmental Protection Agency to be a secondary contaminants and are regulated for aesthetic considerations, such as taste, odor and color. Radium is a primary contaminant and is regulated to protect human health.

The project's objective is to correct these water quality deficiencies and bring the levels of the three contaminants to well below their respective maximum federal levels. A secondary objective is to upgrade the original 1970's pumping and electronic equipment.

Madison Water Utility has three other wells with filtration systems for removing iron and manganese. In 2018 and 2019, Madison Water Utility conducted pilot testing at Well 19 to confirm that the same type of filtration system would work there and determine the extent that radium could be removed incidentally. Based on the results of that study, the Utility has determined that 95% of iron and manganese and 50% of radium can be removed with a pyrolusite filtration system like those installed in the three other wells. To maintain the pumping capacity of Well 19, 16 four foot diameter filter vessels will be required; these will be housed in a building addition off the northeast corner of the existing building. The treatment system includes a separate semi-buried backwash tank used to temporarily hold wastewater generated from backwashing the filter system. The scope of the project also includes upgrading the original pumps and electronics to more energy efficient models, and improving the site landscaping and screening.

## **Existing Site Conditions**

Unit Well 19 is located on a 260-foot by 260-foot easement on University of Wisconsin-Madison property at 2526 Lake Mendota Drive. The site is immediately east of the Eagle Heights student housing complex, north of the Eagle Heights Community Gardens and within the Lakeshore Nature Preserve. The facility is set approximately 20 feet below street level with a steep driveway and a small parking lot. The site is mostly open and free from trees and large vegetation except along the north easement edge and the west side along Lake Mendota Drive.

Put into production in 1974, the Unit Well 19 facility consists of a deep well pump, three booster pumps and a 3-million gallon buried reservoir. The well runs year-round and pumps 300 to 500 million gallons annually. The reservoir is covered with approximately 18 inches of soil and grass and is mowed regularly, as is the area around the generator and wellhouse. There is a small grinder pump and holding tank located in the parking lot that pumps small amounts of wastewater to the University sanitary sewer system. Other entities have facilities located on the site as well. MGE owns and maintains a 600kW back-up diesel generator for running the facility at will during peak demands. Dane County has a warning siren north of the wellhouse. The National Atmospheric Deposition Program (NADP) owns and maintains air quality testing equipment mounted along the eastern edge of the buried reservoir.

Unit Well 19 is a critical drinking water supply point for the University, the Utility's largest customer, as well as the entire near west side of Madison. It is located in the Utility's Pressure Zone 6–West, one of the largest semi-isolated distribution zones that extends west from the Yahara River to the southwest shores of Lake Mendota, and south to the City of Fitchburg border.

## **Proposed Use and Design**

The proposed project is the addition of a water treatment system to an existing municipal well. The facility will continue to deliver drinking water during and after construction. The project consists of the following major design components:

- An addition to the existing wellhouse to house the filtration system
- A separate semi-buried backwash tank
- Driveway and parking lot reconfiguration
- Site landscaping to improve screening and native plantings

The design of the addition respects the existing building, matching the original building in height and general appearance. The addition roof line mimics the original building's split-roof design. Because the aged existing exterior finish could not be color-matched, a contrasting color for the addition exterior was chosen with the selected product matching the existing exposed aggregate finish.

The semi-buried backwash tank is located north of the addition and set into the sloped site such that the southern face will have approximately five feet of exposure and the northern face two to three feet. The tank roof will be very slightly pitched and covered in a water-proof membrane per DNR code.

The original asphalt driveway is being reconfigured to accommodate modern fire protection and large crane access requirements. A pervious pavement drive off the main asphalt drive will allow MGE access to their generator at the northwest corner of the easement.

Finally, with input from UW-Madison and Lakeshore Nature Preserve staff, the landscaping plan was developed to maximize screening and focus on native Wisconsin species. The plan specifically blocks the site from viewsheds along the footpath to the north, the Preserve to the east and Eagle Heights to the west. The plantings fill in the low, mid-range and upper canopy with native grasses and flowers, shrubs and deciduous trees.

### **University of Wisconsin-Madison & Lakeshore Nature Preserve Coordination**

The existing facility is located on an easement on University property and within the Lakeshore Nature Preserve. Though the project is not subject to the University project approval process through its Design Review Board (DRB), the project team has had regular interaction with and has proactively sought and included input from both UW and Preserve staff. Madison Water Utility staff met with the DRB and the Joint Campus Area Committee (JCAC) on January 18 and 27, 2022 to deliver an informational presentation to each committee. As the selected design consultant began design development, the team regularly sought out and incorporated University and Preserve staff feedback. Specifically, the Utility's team has had regular interaction with Aaron Williams, Interim Director, UW-Madison Campus Planning & Landscape Architecture, Rhonda James, UW-Madison Senior Landscape Architect, and Laura Wyatt, Lakeshore Nature Preserve Program Manager.

### **Site Changes**

Other than the building additions and landscaping improvements mentioned above, the site changes are minimal. Additional asphalt drive and parking area will be added for access purposes. Site grading will minimize and smooth the slope along the proposed driveway to the extent possible. Site utilities to the additions as well a new hydrant in the Lake Mendota Drive right-of-way and its associated piping will be installed.

### **Phasing Plan**

The project will be built in two phases. Phase 1 of construction will begin in the summer of 2023 and will consist of site grading, site utility installation, building construction and landscaping. The need for and timing of Phase 2 is being driven by supply chain issues and long lead times for specialized equipment. Current estimates for delivery of electronic equipment and fabricated filtration vessels is approximately one year. Phase 2 is planned to begin in the spring or summer of 2024 and be completed by the end of June 2025. The second phase will consist of the installation of the filtration system, process piping and the new motor control center. It is expected that construction will be idle for some time between the two phases.

### **Land Use Approval**

The project is being submitted as a new conditional use.

### **Number of Employees**

Madison Water Utility employs approximately 125 full-time permanent employees.

## Project Schedule

October 31, 2022	Land Use/Conditional Use Application Submittal
December 12, 2022	Plan Commission Approval
January 3, 2023	Common Council Land Use Approval
April 2023	Common Council Bid Let Approval
May 2023	Plans Advertised for Bid
May 2023	Bids Received
June 2023	Construction Contract Executed
July 2023	Construction Start
June 2025	Construction Completion

## Project Team

Madison Water Utility  
119 East Olin Avenue  
Madison, WI 53713

Kelly Miess, PE, MWU Project Manager  
Joe Grande, Water Quality Manager  
Pete Holmgren, PE, Chief Engineer  
Adam Wiederhoeft, PE, Design & Construction  
Joe Demorett, PG, Water Supply Manager  
Chris Wilkins, Control Systems Engineer  
Doug Van Horn, Maintenance Supervisor  
Dan Rodefeld, Operations Manager  
Marcus Pearson, Public Information Officer

Design Engineer & Architect:  
SEH, Inc.  
6808 Odana Road  
Suite 200  
Madison, WI 53719

Randy Sanford PE, SEH Project Manager  
Miles Jensen, PE, Process Engineer  
Brad Weiss, PE, Process Engineer  
Trevor Frank, AIA, LEED AP, Architect  
Caitlyn Blue, PLA, Landscape Architect  
Nick Brula, PE, Mechanical Engineer  
Jeff Mathis, PE, Electrical Engineer  
Tom Sontag, PE, SCADA Engineer  
Ariel Christenson, PE, Structural Engineer  
Jeff Nussbaum, PE, Civil Engineer  
Chad Katzenberger, PE, Hydraulic Modeler  
Eric Davenport, Construction Manager

## Building Footprint:

Existing Building:	2,887 SF
New Addition:	1,473 SF
Semi-buried Tank:	960 SF
<b>Total:</b>	<b>5,320 SF</b>

## Auto and Bike Parking Stalls

There is room for 2-3 maintenance vehicles or a large crane to be parked on site. There are no bike parking stalls; the only planned visitors to the facility are Utility staff.

## Hours of Operation

The well and pumps run up to 24 hours a day. The station is visited by water utility staff a minimum of once per day to check operation and take readings.

## Existing Site Photos



An aerial view showing the wellhouse and the buried reservoir along Lake Mendota Drive.



A view looking northwest at the front of the wellhouse and over the buried reservoir. Eagle Heights is behind the tree line across Lake Mendota Drive.



A view looking southeast at the back of the wellhouse building from the top of Lake Mendota Drive. MGE's generator is visible to the right. The Dane County warning siren is just left of the driveway and the air quality equipment can be seen in the background.