

# Executive Summary

## BACKGROUND

The existing reservoir is located on land that is leased from Dane County and provides water storage and fire protection to Pressure Zone 5. The tank was constructed in 1938 to supply water to the Lakeview Sanatorium. The tank is located adjacent to Lakeview Park, which is a part of the Dane County park system. In order to mitigate disturbances to the park and surrounding areas, it is desired that the new reservoir be constructed in the same location as the existing reservoir. The existing reservoir has an overflow elevation of 1140 and serves approximately 190 homes and a portion of the Dane County Human Services campus within Zone 5. **See Project Location Map**

## System Deficiencies

The 2006 MWU Water Master Plan completed by Black & Veatch determined that Pressure Zone 6E currently has a storage deficiency and insufficient fire flow capacity in the vicinity of Pressure Zone 5 (**See Deficient Fire Flow Map**). Similarly, the same Master Plan identified Zone 5 as currently lacking sufficient fire flow capacity in both the residential and the commercial/institutional areas, mainly due to existing limited reservoir storage volume, the restriction of 6-inch water main in the area and the limited capacity of the nearby Lakeview Booster Station.

## Design and Regulatory Consideration

Telecom Equipment - The existing tower sits at a high elevation that has attracted multiple cell phone carriers. The City of Madison has also utilized the site for its own telecommunication equipment. Cell carrier lease revenues are split 50/50 between Dane County and the City of Madison.

Lakeview Booster Station- The Lakeview Booster Station is located southeast of the Lakeview Reservoir and fills the existing reservoir with water obtained from Pressure Zone 6E.

Aesthetic Appearance- MWU desires a facility that will compliment the Lakeview Hill neighborhood as much as possible, while maintaining budgetary goals. Dane County Department of Human Services campus buildings, as well as the telecom equipment buildings, all maintain a matching brick façade exterior.

Permitting & Approvals- Due to the nature of the proposed project scope, various permits and approvals will be required. MWU and SEH will work with Wisconsin Department of Natural Resources (DNR), Wisconsin Public Service Commission (PSC), Federal Aviation Administration (FAA), Madison Planning and Zoning Departments, and Board of Public Works throughout the duration of the project planning and construction.

Project Schedule - (**See Schedule Display**)

## Environmental Considerations

The land upon which the Lakeview Reservoir is located was developed in the early 1900s as a tuberculosis sanatorium by Dane County. In April 1993, several buildings that contributed to the old sanatorium were added to the National Register of Historic Places, including the water utility building and the existing water tower. A follow-up study<sup>(1)</sup> was performed in 2008 to identify any historical archaeological sites within the parcel, and no evidence of any such sites was discovered. (**See Lake View Hill Park Master Plan- Cultural Features**)

## Public Meetings

Two CAP meetings were held. The first meeting took place on September 2013 which introduced the Utilities need for the project, background and history of the tank. Input was solicited and concepts were developed. A second CAP meeting was held on October 30, 2013 where three tank concepts were

developed (See Alternatives Displays1. two zone reservoir, 2. reservoir & booster station, 3. two reservoirs)

#### Alternative Analysis

**Table 1**  
**Estimated Project Capital Costs for Lakeview Reservoir Reconstruction Alternatives**

<b>Alternative Description</b>	<b>Estimated Capital Costs</b>
Two Zone Reservoir	
Steel Upper and Lower Structures	\$4,000,000
Steel Upper and Concrete Lower Structures	\$3,500,000
Zone 6E Reservoir and Booster Station	\$2,700,000
Zone 6E Reservoir and Zone 5 Reservoir	\$3,200,000

**Table 2**  
**50-Year Life Cycle Costs for Maintaining Water Tanks**

<b>Alternative Description</b>	<b>Maintenance Costs</b>	<b>Present Worth</b>
Two Zone Reservoir	\$7,829,900	\$2,975,250
Zone 6E Reservoir and Booster Station	\$9,636,000	\$3,722,950
Zone 6E Reservoir and Zone 5 Reservoir	\$9,504,800	\$3,596,470

**Table 3**  
**Combined 50-Year Life Cycle Present Worth for Maintaining Water Tanks & Capital Costs**

<b>Alternative Description</b>	<b>Capital Costs*</b>	<b>Combined Present Worth &amp; Capital Costs</b>
Two Zone Reservoir	\$4,000,000	\$6,975,250
Zone 6E Reservoir and Booster Station	\$2,700,000	\$6,422,950
Zone 6E Reservoir and Zone 5 Reservoir	\$3,200,000	\$6,796,470

\*Capital Costs Include 20% Engineering, Legal, and Contingency.

### Evaluation Matrix

<b>Lakeview Reservoir Decision Matrix</b> (Scale 1 – 3: 1 = Least Desirable, 3 = Most Desirable)			
Alternative	Two Zone Reservoir	Zone 6E Reservoir + Booster Station Upgrade	Zone 5 Reservoir + Zone 6E Reservoir
Economic Considerations	3	3	2
Footprint	3	2	1
Reliability	3	2	3
Totals	9	7	6

**Recommendation** Based on the information included in this technical memorandum our design team recommends that the Utility move forward with the design of the two zone reservoir as shown in **Figure 4**.

