



DRAFT – FOR REVIEW AND IMPROVEMENT ONLY

**East Side Water Supply Project
CAP Advisory**

Title: Water Demand on the East Side of Madison

Author(s): Various CAP members

Introduction

The Madison Water Utility is developing a system evaluation, capital project development, and water quality project for the east side of the Utility's main pressure zone (Zone 6-East.) The Water Utility has established a "CAP", Citizens Advisory Panel, to advise the Utility and the Water Utility Board and to facilitate the public review on this project. The CAP operates by the direction provided in the Madison Water Utility's Standard Operation Manual, ENG-001, entitled Public Participation Process for Water Utility Facilities.

The CAP began meeting October 8, 2010. On January 21, 2011, the CAP received a Technical Memorandum from Black & Veatch entitled, Water Demand Projections. Since January, the majority of the meetings of the CAP have been devoted to the issue of Water Demand Projections, including the impact of the adopted Conservation Plan on future demands.

Purpose of the Advisory

The objective of this advisory is to advise the Water Utility Board on the projected water demand and the capacity of the Water Utility to meet demand on the east side of the city served and supported by Pressure Zone 6-East.

Main Point

Based upon the data presented by Black & Veatch and reinforced with a detailed spreadsheet prepared by Water Utility staff¹, water supply facilities are not adequate to serve the Pressure Zone 6-East services area even with the successful implementation of the Conservation Plan. We understand that the water works operators, those employees who are licensed by the state to operate the system, are concerned about the system's ability to provide adequate water during periods and events that the Water Utility needs to anticipate and manage. In other words, the Utility employees confirm calculations that point to a lack of capacity in the system.

Prudent contingency planning assumes that two water Wells are not available for service due to maintenance or equipment failure. In Pressure Zone 6- East, there are three Wells of questionable reliability. Unit Wells 7 and 8 are not available for continuous service because of dirty water due to manganese and iron levels. The continued operation of Unit Well 15 is threatened by increasing VOC levels. Even with Unit Wells 7, 8, and 15 in service, the ability of east side water facilities to meet projected demand is marginal. This can be corrected with the addition of another Well.

¹ The spreadsheets prepared by Water Utility Staff is a valuable tool that can be used to provide the public with historical data, criteria, and risk analysis to help evaluate the water works system as well as generating "what if" scenarios.



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In formulating this point, the authors recognize that:

- It is incumbent on the Madison Water Utility to provide a reliable source of clean water for its customers.
- The number of Wells being used to provide water service (either more Wells or fewer) has no direct bearing or relationship to the amount of water being demanded by city residents. *Our endorsement of plans for an infrastructure that improves and expands capacity for supply, quality and service should not be seen as an endorsement of a delivery strategy that promotes unlimited consumption.*
- The Madison Water Utility is obligated to plan and implement water infrastructure that is compatible with the City's officially adopted policies regarding present and future population, urban development, and conservation.
- This Advisory is based upon the understanding and belief that the adopted Water Conservation and Sustainability Plan will be implemented, sustained, and improved.
- Redundancy and contingency plans are necessary in providing a reliable source of clean water, as a form of insurance (i.e., plan for the worst and hope for the best)
- Providing more Wells rather than fewer provides greater assurance, flexibility, and opportunity to address other water quality and quantity challenges being faced by the Water Utility and its customers.
- Pumping from Wells located closer to the Yahara Lakes (a renewable water supply) will help mitigate the impacts to more sensitive and vulnerable tributary streams.²
- Capitalizing on opportunities to deal with multiple problems simultaneously is a critically important and vital aspect of water supply infrastructure planning. *Future Well plans should proactively consider the localized impacts—beneficial and/or detrimental—of high capacity groundwater withdrawal.*

The elevation of both the shallow and deep aquifer serving the East Side has rebounded and the hydraulic gradient between the aquifers has been reduced. This has been attributed to a number of events, including:

- Increased rain and snowfall, which may be attributed to climate change
- Lake levels have been consistently higher than historic elevations and as required by current regulations
- Water conservation by Oscar Mayer, the gradual reduction in use of the company's water Wells between March 2002 and December 2005, and the purchase of water from the Madison Water Utility
- Well 3 was shut down in May 2006 and subsequently abandoned due to high carbon tetrachloride levels as well as high manganese and iron levels
- Well 7 and Well 8 have been operated on a limited basis due to high manganese and iron levels

² Dane County Regional Planning Commission. *Evaluation of Alternative Management Strategies*. Dane County Hydrologic Study. August 1997.



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The infiltration of water into the basements of area residences in 2008 has been attributed to higher groundwater in the shallow aquifer. However, the rise in shallow water tables is apparent in many locations in southern Wisconsin since about 2007 as a result of rain, snowfall, and freeze-thaw conditions. In many of these areas, there were no decreases in pumping associated with high water table problems—the weather alone was severe enough to cause “groundwater flooding” (at several subdivisions in Waukesha and Rock Counties, the Town of Spring Green, and the Town of Vienna). Less pumping could exacerbate the high water table conditions on the north side, but it is not the sole cause of the high water table near the lake.

Recommendations

We recommend that the Water Utility construct treatment facilities for Well 7, 8, and 15 and develop a replacement Well site for Well 3. In addition, the search for a site to replace Well 3 should proactively consider the localized impacts—beneficial and/or detrimental—of high capacity groundwater withdrawal.

Based upon information submitted to the CAP, treatment of Unit Wells 7 and 8 is likely to be similar to the filtration process used for Well 29. Separate, Well-specific CAPs for Wells 7, 8, 15 and the replacement of Well 3 will provide additional advisories on recommended treatment options.

Priority

We recommend that these projects be scheduled so as to place new and upgraded Wells in operation as soon as practicable and in conformance with the financial ability of the Utility.

The loss of Well 15 if VOC contamination exceeds EPA standards will seriously compromise the Utility’s ability to serve current and future demands of east-side customers. In addition, the need to put water into the system with visible levels of iron and manganese will not meet the standards of the Utility or generate customer support.