

# Internal Monitoring Report

Policy #: O-2A Water Quantity

Monitoring Frequency: Twice a year

Date: April 24, 2012

I certify that the following information is true.

Signed  \_\_\_\_\_, General Manager

## Policy Language:

Current and future customers will receive water that meets or exceeds industry-accepted levels of service for fire protection and pressure.

This includes:

1. Water delivered to hydrants at proper flow rates for fire protection.
2. Water delivered to the customer tap at a pressure that meets industry-accepted low, high, and emergency operation criteria.
3. Water used for outdoor irrigation under drought-free conditions.

## General Manager's interpretation and its justification:

This Outcomes policy requires that the Utility budget for, fund, prioritize, plan for, and construct the necessary system improvements to provide adequate water quantity to all areas of the system. The Utility has developed a Level of Service Memo that establishes minimum standards for pressure and fire protection. A copy of the level of service memo is attached for information and use. Current system performance will be measured against these criteria.

Using the established level of service guidelines, the system is evaluated for performance using the Utility's distribution system computer model as a part of the master planning process. The most recent system wide master plan was finished in 2006 and adopted in 2008. A major update of the east side water system capital improvement plan was completed this spring as part of the East Side Water Supply project. This document will be presented to the Board at the April meeting. An update of the west side of the system is tentatively scheduled for 2013. The results of these evaluations will be included in this monitoring report.

Other sources of data that will be used for this monitoring report will be consumer complaints and other records maintained by the Utility.

## **Data directly addressing the General Manager's interpretation:**

1. *Water delivered to hydrants at proper flow rates for fire protection.*

The fire flow analysis developed in the 2006 Water Master Plan, Figure 5-8, is attached to this memo for information and use. This document provides a graphical representation of the fire flow capacity across the system.

Arbor Hills: The Arbor Hills neighborhood was identified in the 2006 Water Master Plan as having a significant area of fire flow deficiency. The recommended solution to correct this deficiency was to construct Booster Pump Station 118 and the Cannonball pipe line. These facilities will transfer water between Pressure Zone 6 and Pressure Zone 7. The proposed 16-inch water transmission main will be constructed in four (4) phases. The first two phases were completed in 2009 and 2010. Phase 3 is currently in design and will be constructed in 2012. Phase 4 is scheduled for construction in 2013. Construction of Booster Pump Station 118 will be finished in May 2012 and with the completion of Phase 3 of the Cannonball pipeline this fall, the new facility is expected to be in full operation by October 2012.

Following construction of the Cannonball pipeline and Booster Pump Station 118, fire supply capacity at Leopold Elementary School will increase from approximately 1500 gpm to approximately 4000 gpm bringing it into compliance with Utility fire flow capacity standards. Similar increases in fire fighting capacity will be realized throughout the Arbor Hills neighborhood.

The installation of the pipeline and booster pump station will also provide a redundant source of supply to the area significantly improving reliability and operational flexibility.

Pressure Zone 4: Fire flow capacity in Zone 4 will be augmented by the construction of Well 31. The Utility identified a potential well location on Tradewinds Parkway and drilled a test well in 2011. Water quality at the test well was preliminarily deemed acceptable but well capacity was not adequate. It is suspected that a geologic fault in the Tradewinds Parkway area and a tight rock formation is limiting well capacity.

A second potential well site was identified near the intersection of Dairy Drive and Blazing Star Drive. A right of entry has been obtained for a second test well and work on the well will commence in July. Sampling and testing will be conducted in August. If this 2<sup>nd</sup> location meets Utility requirements for quality and quantity, the Utility will move forward with a production well. If this site is similar in projected quantity to the Tradewinds Parkway location, an evaluation of both sites will be completed to either make a decision to proceed with one of these sites or to continue the search for a suitable well location on Madison's southeast side.

Following the selection and procurement of a suitable well location, a production well will be drilled and developed in Pressure Zone 4 in either late 2012 or the spring of 2013. Unit Well 31 will then be designed for construction in either 2013 or 2014. With the completion of this new supply facility, fire flow availability, reliability, and capacity of the system within Pressure Zone 4 will be greatly improved.

East Side Water Supply Analysis: Fire flow availability was evaluated for the east side during the assessment of the system for the East Side Water Supply project. Figure 26 from the report presents the results of the fire flow analysis based on 2010 maximum day demands. Figure 26 is attached for your information and use.

Figure 26 indicates fire flow deficiencies in the south end of Zone 6, around the Northport Drive reservoir, in Zone 4 south of the beltline, and in a few isolated areas around the system. Piping and facility projects are planned in the Master Plan that will address these issues over the next several years.

Hydrant Maintenance and Testing: In 2011, 4,910 of 8,555 fire hydrants were inspected and serviced. Flow tests were completed at 27 fire hydrant locations. This program of hydrant maintenance and testing meets WDNR requirements.

I report non-compliance with mitigation projects in progress and scheduled.

2. *Water delivered to the customer tap at a pressure that meets industry-accepted low, high, and emergency operation criteria.*

Pressure planning and design criteria for Madison Water Utility are established in Table 2 of the attached Level of Service Memo. A query of the system indicated that of 8,458 fire hydrants with static pressure readings, less than 0.3% were below 40 psi, 3.8% were greater than 100 psi, and 0.1% were greater than 125 psi. Customers in areas where pressures exceed 125 psi are fitted with individual pressure reducing valves. Per Utility guidelines, the full cost of these pressure reducing valves is paid by the Utility.

Areas identified with high pressures are evaluated as to the feasibility of moving them to a lower pressure zone or creating another pressure zone using system pressure reducing valves. Maintaining adequate fire flow in the area will remain a prime objective in considering any changes to the system.

An area of chronic low pressure exists within the system around the Bunker Hill Reservoir (Reservoir 115) in the area just west of East Towne Mall. A project that will convert this area from Pressure Zone 6 to Pressure Zone 3 has been identified in the Master Plan and is included in the Utility Capital Budget for the year 2013.

I report non-compliance with mitigation projects in progress and scheduled.

3. *Water used for outdoor irrigation under drought-free conditions*

During the 2011 reporting period, Madison Water Utility did not issue an irrigation restriction due to drought conditions or water supply limitations.

I report compliance.

**Attachments:**

1. Draft Level of Service Memo – January 10, 2011
2. 2006 Master Plan Fire Flow Capacity Map Figure 5-8
3. Figure 26 – 2010 East Side Maximum Day Fire Flow Availability