

Internal Monitoring Report

Policy #: O-2E Sustainability
Frequency: Twice a year (May and December)

Date: May 28, 2013

I certify that the following information is true.

Signed , General Manager

Policy Language:

Madison residents will benefit from a sustainably managed ground water supply to ensure that water is available to protect public health, and to maintain and improve the economy and environment in Madison, now and in the future.

Accordingly,

1. Aquifers and wells will be monitored and the data evaluated to identify trends in water levels and potential contaminants.
2. Appropriate city, county, state and federal agencies will be called upon to enforce all pollution control and prevention measures within their authority, in order to protect water quality in the well head protection area of each unit well.
3. The adopted Conservation Plan shall be monitored and evaluated regarding progress to fulfill the goal of a reduction per capita residential use of water by 20% by 2020, which is 58 gallons/capita/day. (Residential is defined as single family and duplex dwellings.)
4. The water supply system shall be expanded so that the pumpage from individual unit wells shall not exceed 50% of the annual rated capacity of the unit well.
5. Water rates will complement economic growth in Madison (as stated in 0-2D).

General Manager's interpretation and its justification:

This policy prescribes certain activities intended to ensure the long term environmental, public health, and economic sustainability of Madison's water supply. Our actions relating to these objectives are detailed below.

Data directly addressing the General Manager's interpretation:

1. *Aquifers and wells will be monitored and the data evaluated to identify trends in water levels and potential contaminants.*

Water Levels

Water levels in the aquifers beneath Madison continue to vary on a seasonal basis. Levels at a long term monitoring well located in the basement of the State Capitol indicate that overall levels appear to be holding relatively steady with an increase (10' - 12' of rebound) occurring over the last 10 years. The water levels beneath the central part of our city during the last 30 years are displayed in Figure 1.

The static and pumping water levels in many of the Utility's wells varied significantly during

2012. Many of the wells experienced very low water levels during the summer months, a result of the extreme hot and dry conditions. A review of the water level data indicates that, with the exception of several wells, most of the water levels continue to recover and are close to 2011 levels. Water levels in the wells continue to fluctuate seasonally and are greatly influenced by precipitation events. Average static and pumping water levels for 2011, 2012, and 2013 are depicted in Table 1.

University Crossing/UW #14

A set of three shallow monitoring wells were installed at the University Crossing Development to observe groundwater quality during site re-development. The wells were installed in March of 2012 with the Utility paying 50% of the installation costs. These wells and UW #14 are being sampled and analyzed on a quarterly basis for a period of two years. All sampling costs are paid 100% by the Utility. There have been five samplings to date, the most recent in April of this year. No Volatile Organic Compounds have been detected in any of the three monitoring wells. Elevated levels of several inorganic compounds exist in the wells (chloride, sodium, and nitrate). These compounds, however, do not appear to be increasing in UW 14 as the site development progresses.

Madison Kipp Corporation/UW #8 Sentinel Well

Groundwater at the Madison Kipp Corporation (MKC) facility continues to be monitored for VOCs. A new monitoring well (MW-25) was recently installed at the intersection of Ludington Avenue and Center Avenue, approximately 600 feet northwest of Unit Well 8. Preliminary sampling indicates low levels (1.6 – 3.3 ug/l) of tetrachloroethylene (PCE) exist at a depth of 100 – 130 feet below the surface here. It appears that the edge of the PCE plume has reached this location. Conformational sampling has been conducted at this location and the pending results will be used to verify the presence and concentration of this compound. The installation of the sentinel well, proposed to be installed adjacent to Elmside Circle Park, remains on hold.

UW #29 Sentinel Well

Semi-annual monitoring of both inorganic and volatile organic compounds is conducted at the sentinel well near Well 29. Sampling is conducted in April and October of each year with eight samplings conducted to date. Results from the latest April sampling reveal minor detects of toluene, which can be attributed to the coating on the well liner. These detects range from 0.16 – 0.52 ug/l. The MCL for toluene is 1000 ug/l. Trichlorofluoromethane was also detected in the shallowest port at a level of 0.32 ug/l (no MCL). This compound occurs at the water table surface throughout the area. Sampling indicates that the migration of contaminants from the Sycamore landfill is not a significant threat to water quality at Unit Well 29 at this time.

Zone 4 Production Well

GE Healthcare continues to sample, on a semi-annual basis, the monitoring well located on Water Utility property at 5802 Femrite Drive. Trichloroethylene (TCE) is consistently found at the 10 ug/L level – twice the enforcement standard for groundwater quality. None of these volatile or synthetic organic compounds were detected at either the Tradewinds Parkway or Dairy Drive test wells in the samples collected to date. The Tradewinds test well is located

about a mile southwest of the Femrite monitoring well and over 6000 feet from the source of the TCE contamination. The Dairy Drive test well is located to the northwest of the Femrite well. It is slightly closer to both the Femrite well and the TCE contaminant source. Both test wells have been abandoned.

The Utility has acquired the Tradewinds Parkway site, gained approval from the WDNR to install a production well there, and is in the process of hiring a contractor to drill it.

I report compliance.

2. Appropriate city, county, state and federal agencies will be called upon to enforce all pollution control and prevention measures within their authority...

The Utility continues to work with the Mayor's office and the WDNR in monitoring the subsurface investigation and remediation of the PCE contamination at the Madison Kipp site. At the request of the WDNR, the Madison Water Utility, City Engineering, and Public Health recently reviewed the Site Investigation and Interim Actions Report prepared by Arcadis for MKC. A letter to the WDNR summarizing the city's concerns and recommendations for additional site work, including remediation options, was drafted and sent to the Department in early May.

I report compliance.

3. The adopted Conservation Plan shall be monitored and evaluated regarding progress to fulfill the goal of a reduction per capita residential use of water by 20% by 2020...

Residential consumption in gallons per capita by year:

2002-2007	73.0
2008	69.8
2009	67.8
2010	65.0
2011	65.2
2012	70.1
Goal: 2020	58.0

I report compliance.

4. The water supply system shall be expanded so that the pumpage from individual unit wells shall not exceed 50% of the annual rated capacity of the unit well.

Our service level for capacity planning is 50% utilization, and system expansion is being planned to accomplish this level. Overall, 2012 utilization rates were slightly higher than those experienced in 2011. To date, 2013 well utilization rates are relatively similar to last year. Well repair/reconstruction projects continue to significantly influence individual well rates. Actual utilization rates for 2012 and 2013 are shown in Tables 2 and 3.

I report compliance.

5. *Water rates will complement economic growth in Madison (as stated in O-2D).*

Please refer to the Monitoring report for the Affordability Outcomes Policy (O2-D).

I report compliance.

Other Sustainability Initiatives

Electronic Annual Drinking Water Report

Water utilities are required by law to prepare and distribute an annual report on drinking water quality each year. The largest utilities must make a “good faith effort” to reach all water consumers not just bill-paying customers. For Madison, this meant printing and mailing approximately 115,000 copies of the annual report to all mailing addresses in the City of Madison. New EPA rules this year allowed electronic delivery of the annual report – making it available on our website and notifying customers of its availability with a postcard, our water quality listserv, and a press release. Madison chose this option for delivery of this year’s report. Further, the water utility scaled back to four-pages from the previous eight-page report. Paper copies continue to be available upon request and will be distributed to libraries, hospitals, and clinics. This delivery strategy is expected to use even fewer resources (paper, ink, electricity, etc.) in coming years as the utility leverages monthly billing and electronic notification associated with Project H2O, our meter upgrade program, to optimize customer communications.

Energy Conservation Assessment

The Utility’s UW Engineering Grad student, Nick Baniel, is working on developing a high level energy conservation assessment and a frame work for future study, data gathering, and energy conservation improvement projects. Nick has been gathering electrical usage data for all of our facilities for the last four years. He is evaluating that data and looking at general trends and overall conditions. This work will lead toward the development of energy use metrics that can be used to identify areas for further study.

During the coming summer, Nick will be conducting a three phase energy evaluation of several wells and pumping stations in the system. Using a power system analyzer that will record operational conditions and the information recorded by the Utility SCADA system, Nick will identify what data is needed to determine the overall efficiency of the electrical system. Nick will also evaluate the hydraulic side of our pumping station looking for ways to measure pump efficiency with the intent to develop maintenance projects that will keep our pumps operating at peak efficiency. System operational conditions will also be assessed during the data collection using the Utility’s water distribution system computer model.

Objectives of this first energy conservation research project include: 1) the identification of data and metrics necessary to effectively monitor facility performance, 2) identification of potential areas of energy reduction; and 3) an outline of areas to be more fully developed as a part of an energy conservation program. The work is expected to be completed by the end of 2013.

Attachments:

Figure 1: Aquifer Water Levels Graph

Table 1: Unit Well Water Levels

Table 2: 2012 Unit Well Capacity

Table 3: 2013 Unit Well Capacity

Figure 1: Aquifer Water Levels - State Capitol Well

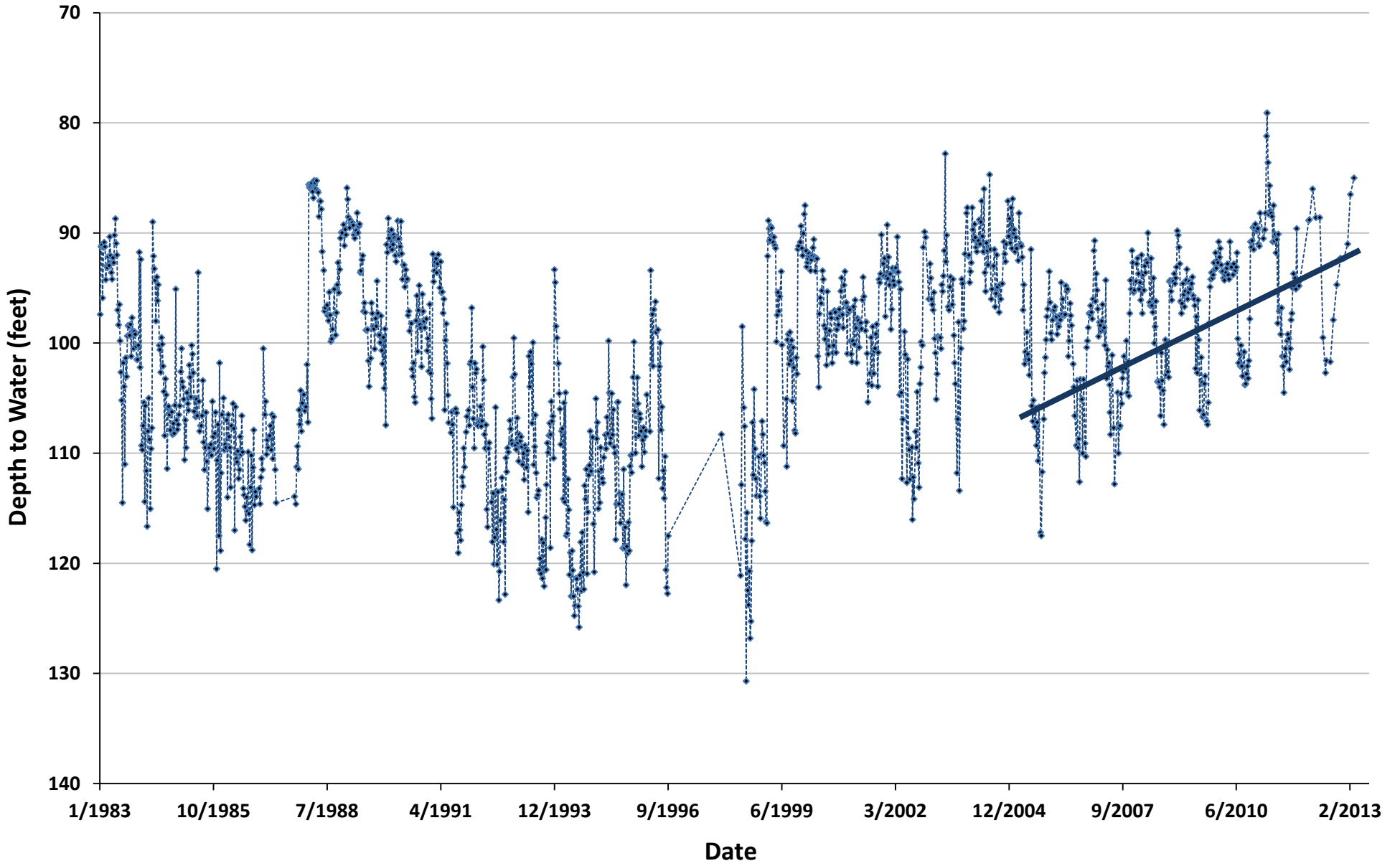


Table 2: 2012 Unit Well Capacity

Start Date: January 01, 2012

End Date: December 31, 2012

Unit Well	DW Capacity GPM	Total Daily Capacity MGD	Total Capacity To Date Mil Gal	Actual Pumpage To Date Mil Gal	% DW Utilization		DW Run Hours To Date	DW Rest Hours To Date	% DW At Rest To Date	% DW Running To Date
6	2,703	3.9	1,424.5	634.5	44.5%		3,999.8	4,784.2	54.5%	45.5%
7	2,052	3.0	1,081.2	285.5	26.4%		2,801.9	5,982.1	68.1%	31.9%
8	1,960	2.8	1,033.0	10.3	1.0%		178.2	8,605.8	98.0%	2.0%
9	1,746	2.5	920.2	498.6	54.2%		4,780.8	4,003.2	45.6%	54.4%
11	2,030	2.9	1,069.9	572.1	53.5%		4,714.1	4,069.9	46.3%	53.7%
12	2,317	3.3	1,221.0	560.8	45.9%		4,051.5	4,732.5	53.9%	46.1%
13	2,713	3.9	1,429.6	760.2	53.2%		4,800.1	3,983.9	45.4%	54.6%
14	2,377	3.4	1,252.8	800.2	63.9%		5,607.9	3,176.1	36.2%	63.8%
15	2,202	3.2	1,160.6	651.4	56.1%		4,975.9	3,808.1	43.4%	56.6%
16	2,496	3.6	1,315.6	494.5	37.6%		3,313.2	5,470.8	62.3%	37.7%
17	2,367	3.4	1,247.3	425.5	34.1%		3,014.9	5,769.1	65.7%	34.3%
18	1,808	2.6	952.7	434.8	45.6%		4,014.5	4,769.5	54.3%	45.7%
19	2,285	3.3	1,204.3	765.1	63.5%		5,601.7	3,182.3	36.2%	63.8%
20	2,055	3.0	1,083.0	680.4	62.8%		5,536.8	3,247.2	37.0%	63.0%
23	1,120	1.6	590.2	152.2	25.8%		2,293.5	6,490.5	73.9%	26.1%
24	1,567	2.3	825.7	379.9	46.0%		4,066.9	4,717.1	53.7%	46.3%
25	1,520	2.2	801.3	491.8	61.4%		5,369.4	3,414.6	38.9%	61.1%
26	2,033	2.9	1,071.3	570.2	53.2%		4,687.4	4,096.6	46.6%	53.4%
27	1,959	2.8	1,032.5	193.2	18.7%		1,655.7	7,128.3	81.2%	18.8%
28	2,249	3.2	1,185.1	329.5	27.8%		2,456.5	6,327.5	72.0%	28.0%
29	2,200	3.2	1,159.5	383.3	33.1%		5,581.0	3,203.0	36.5%	63.5%
30	2,409	3.5	1,269.7	724.1	57.0%		5,021.9	3,762.1	42.8%	57.2%

Table 3: 2013 Unit Well Capacity

Start Date: January 01, 2013

End Date: May 20, 2013

Unit Well	DW Capacity GPM	Total Daily Capacity MGD	Total Capacity To Date Mil Gal	Actual Pumpage To Date Mil Gal	% DW Utilization		DW Run Hours To Date	DW Rest Hours To Date	% DW At Rest To Date	% DW Running To Date
6	2,723	3.9	545.0	229.4	42.1%		1,427.8	1,908.2	57.2%	42.8%
7	2,455	3.5	491.3	131.6	26.8%		899.2	2,436.8	73.0%	27.0%
8		0.0	0.0	0.0	0.0%		0.0	3,336.0	100.0%	0.0%
9	1,775	2.6	355.2	163.1	45.9%		1,532.3	1,803.7	54.1%	45.9%
11	2,039	2.9	408.2	190.6	46.7%		1,563.5	1,772.5	53.1%	46.9%
12	2,263	3.3	453.0	125.8	27.8%		928.8	2,407.2	72.2%	27.8%
13	2,670	3.8	534.4	289.4	54.2%		1,810.3	1,525.7	45.7%	54.3%
14	2,297	3.3	459.8	340.1	74.0%		2,468.0	868.0	26.0%	74.0%
15	1,963	2.8	393.0	125.4	31.9%		1,136.4	2,199.6	65.9%	34.1%
16	2,487	3.6	497.8	98.8	19.8%		666.2	2,669.8	80.0%	20.0%
17	2,368	3.4	474.0	56.2	11.8%		393.5	2,942.5	88.2%	11.8%
18	1,802	2.6	360.6	143.2	39.7%		1,345.0	1,991.0	59.7%	40.3%
19	2,274	3.3	455.2	270.8	59.5%		1,991.2	1,344.8	40.3%	59.7%
20	2,053	3.0	410.9	278.1	67.7%		2,284.4	1,051.6	31.5%	68.5%
23	1,041	1.5	208.3	8.6	4.1%		149.5	3,186.5	95.5%	4.5%
24	1,991	2.9	398.6	174.1	43.7%		1,490.7	1,845.3	55.3%	44.7%
25	1,534	2.2	307.1	157.8	51.4%		1,735.1	1,600.9	48.0%	52.0%
26	2,073	3.0	415.0	322.7	77.8%		2,596.1	739.9	22.2%	77.8%
27	2,043	2.9	408.8	57.5	14.1%		471.0	2,865.0	85.9%	14.1%
28		0.0	0.0	0.0	0.0%		0.0	3,336.0	100.0%	0.0%
29	2,200	3.2	448.0	227.2	50.7%		3,303.0	33.0	1.0%	99.0%
30	2,430	3.5	486.5	276.4	56.8%		1,896.3	1,439.7	43.2%	56.8%