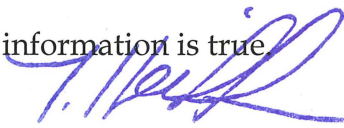


# Internal Monitoring Report

Policy #: O-2B Water Quality

Date: January 24, 2012

I certify that the following information is true.

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

## Policy Language:

Madison Water Utility consumers will receive high quality water that meets or is better than all primary and secondary drinking water standards, including their public notification requirements, and complies with board-adopted water quality goals, incorporated by attachment.

The Madison Water Utility recognizes that drinking water standards are subject to revision and that new compounds of concern will be determined. This dynamic is a result of health studies being conducted by health organizations and government agencies on the state, national and international level. The technology to quantify compounds at increasingly minute levels is constantly improving.

The Madison Water Utility shall maintain and promulgate a Watch List of compounds of concern by unit well of compounds that are increasing and may approach the primary and secondary drinking water standards. The Watch List shall identify which wells require action.

## General Manager's interpretation and its justification:

Few things are more vital to a community than the availability of high quality drinking water. It promotes public health, public safety, and the economic interests of our community. To that end, the water utility will consistently deliver water that meets the primary, health-based drinking water standards, the secondary (aesthetic) standards, and the additional policy goals established by the Board. The Water Utility Procedural Guideline GUIDE 3, which establishes policies regarding iron and manganese, contains the following:

The Madison Water Utility, under normal operating conditions, shall provide water that contains less than the National Secondary Drinking Water Standard for Fe (currently 0.3 mg/L) and Mn (currently 0.05 mg/L) at the customer's tap.

I interpret this to mean that 95<sup>th</sup> percentile results from our routine distribution water quality monitoring program shall be less than these values for iron and manganese.

Utility staff will remain vigilant in following developments related to currently unregulated and emerging contaminants like pharmaceuticals, endocrine disruptors, and chromium-6 that may pose problems in the future. Furthermore, the utility will employ multiple methods to adequately inform its consumers of the safety and quality of their drinking water including the federally-required Consumer Confidence Report (CCR), the water utility website, e-mail distribution lists, neighborhood listservs, citizen meetings, and through staff contact in the field and office.

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

### Primary Drinking Water Contaminants:

In 2011, a total of 4,597 samples were collected and tested for coliform bacteria. This total includes 2,742 compliance samples collected from representative distribution locations and 1,587 samples taken from unit well locations. Wisconsin Administrative Code NR 809 requires that the utility collect 150 monthly distribution samples and not more than 5% of the samples test positive for coliform bacteria. In all of 2011, two samples tested positive for coliform – one in the distribution system and a second from a unit well. Neither location showed the presence of coliforms upon re-sampling. The limited number of coliform positive samples reflects the source water quality and adequate disinfection residuals maintained in the distribution system.

Five wells (9, 11, 14, 15, and 18) are currently on quarterly monitoring for volatile organic compounds (VOC) based on previous VOC detections. Each well was sampled in October and the results are shown below. PCE and TCE are found in all five wells except for Well 9 where TCE has not been detected. The PCE concentration ranged from 0.45 parts per billion [ppb] in Well 11 to 3.2 ppb in Well 15. All detected VOC contaminants are below the maximum contaminant level (MCL) – the regulatory limit. The table below does not include results for trihalomethanes, compounds that form as a result of the chlorination of drinking water.

| VOLATILE ORGANIC COMPOUND  | UNITS | MCL | 9     | 11     | 14     | 15     | 18     |
|----------------------------|-------|-----|-------|--------|--------|--------|--------|
|                            |       |     | 10/11 | 10/11  | 10/12  | 10/12  | 10/12  |
| Dichlorodifluoromethane    | ppb   | --  | <0.11 | <0.11  | [0.12] | <0.11  | <0.11  |
| 1,2-Dichloroethylene (cis) | ppb   | 70  | <0.13 | [0.33] | <0.13  | <0.13  | <0.13  |
| Tetrachloroethylene [PCE]  | ppb   | 5   | 1.5   | 0.45   | 0.53   | 3.2    | 1.1    |
| Trichloroethylene [TCE]    | ppb   | 5   | <0.12 | [0.26] | [0.29] | [0.39] | [0.20] |
| Trichlorofluoromethane     | ppb   | --  | <0.12 | 0.77   | <0.12  | <0.12  | <0.12  |

Well 19 is currently monitored for radionuclides on a quarterly basis due to elevated levels of radium observed in July 2011. That sample exceeded the MCL for combined radium (Ra-226 + Ra-228) which is 5 pCi/L. Tests from September and October show the radium level in the 4.1-4.5 pCi/L range. The utility plans to collect two samples per quarter through 2012. Regulatory compliance is determined by the running annual average of four quarterly samples.

One hundred homes were sampled for lead and copper during two monitoring periods in 2011 to comply with the federal Lead and Copper Rule. The 90<sup>th</sup> percentile levels were 3.6 ppb lead and 176 ppb copper during the most recent monitoring period. Similar results were observed earlier in the year. Because the lead level was less than 5 ppb, indicating optimized corrosion control, Madison will be on a reduced monitoring plan in which samples will be collected from 50 instead of 100 locations.

Policy Goals for Iron and Manganese:

Routine distribution testing from October through December showed two out of 86 samples [2.3%] tested above the iron and manganese policy goals of 0.3 mg/L and 50 ug/L, respectively. Both samples were collected from the City-County Building and reflect water quality changes due to premise plumbing. See attached table for summary statistics.

**Manganese, ug/L**

|                       | <b>Apr - Jun</b> | <b>Jul - Sep</b> | <b>Oct - Dec</b> |
|-----------------------|------------------|------------------|------------------|
| <b>Policy Goal</b>    | 50               | 50               | 50               |
| <b>Minimum</b>        | 0.1              | 0.2              | 0.2              |
| <b>Median</b>         | 3.2              | 3.0              | 4.1              |
| <b>Average</b>        | 5.8              | 6.4              | 7.2              |
| <b>90th</b>           | 15               | 18               | 15               |
| <b>95th</b>           | 19               | 21               | 20               |
| <b>Maximum</b>        | 34               | 51               | 88               |
| <b>Total Count</b>    | 86               | 84               | 87               |
| <b>Number &gt;50</b>  | 0                | 1                | 2                |
| <b>Percent &gt;50</b> | 0.0%             | 1.2%             | 2.3%             |

**Iron, mg/L**

|                        | <b>Apr - Jun</b> | <b>Jul - Sep</b> | <b>Oct - Dec</b> |
|------------------------|------------------|------------------|------------------|
| <b>Policy Goal</b>     | 0.3              | 0.3              | 0.3              |
| <b>Minimum</b>         | 0.001            | 0.001            | 0.001            |
| <b>Median</b>          | 0.015            | 0.016            | 0.019            |
| <b>Average</b>         | 0.043            | 0.046            | 0.042            |
| <b>90th</b>            | 0.077            | 0.098            | 0.099            |
| <b>95th</b>            | 0.161            | 0.178            | 0.149            |
| <b>Maximum</b>         | 0.440            | 0.692            | 0.491            |
| <b>Total Count</b>     | 86               | 84               | 87               |
| <b>Number &gt;0.3</b>  | 3                | 3                | 2                |
| <b>Percent &gt;0.3</b> | 3.5%             | 3.6%             | 2.3%             |

For the year, in which 259 samples were collected, the 95<sup>th</sup> percentile iron and manganese levels were 0.16 mg/L and 21 ug/L, respectively.

Unregulated and Emerging Contaminants:

In 2011, a total of 85 samples – including fifteen collected from monitoring wells located near select municipal wells – were analyzed for chromium-6, a suspected carcinogen and currently unregulated form of chromium. At least two samples were collected at each well. The water utility has been collaborating with the Wisconsin Geological Survey to better understand the sources of chromium to drinking water. Further, the utility recently joined a Water Research Foundation project that will evaluate potential sources of chromium-6, including from ground water, treatment, and pipe components. The project is expected to result in a preliminary treatment evaluation for Madison's drinking water.

Public Outreach on Water Quality:

The water quality pages (Notices, Testing, Lead and Copper) on our website ([madisonwater.org](http://madisonwater.org)) are regularly updated to include the most recent test results available. Water quality updates were posted to the utility website and linked to the drinking water quality listserv in October and December.

About five citizens attended the publicly-noticed Water Quality Technical Advisory Committee meetings held in November and January.

Water Quality Watch List:

The Water Quality Watch list required by the policy is included as an attachment to this report.

I report compliance.

**Attachments:**

A. Water Quality Watch List, January 2012