FOCUSED DRINKING WATER SAMPLING REPORT

SITE:

MARQUETTE UNIVERSITY
MULTIPLE BUILDINGS
MILWAUKEE, WISCONSIN

PREPARED FOR:

MARQUETTE UNIVERSITY
517 NORTH 14TH STREET
MILWAUKEE, WISCONSIN 53233

PREPARED BY:

THE SIGMA GROUP
Single Source. Sound Solutions.

www.thesigmagroup.com
1300 West Canal Street
Milwaukee, WI 53233
414-643-4200
Lead Company DHS #:17570

PROJECT REFERENCE #16596

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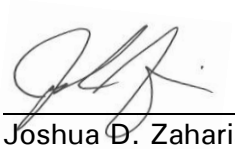

Joshua D. Zaharias
Staff Scientist

8/7/2017
Date

Kristi L. Linsmeier, P.E., CHMM
Senior Engineer

8/7/2017
Date

1. INTRODUCTION

Recent water crises have brought the issue of aging water infrastructure to the nation's attention and have raised public health concerns about lead in plumbing systems used to provide drinking water. Potential sources that could contribute to increased lead levels include city service lines, water distribution systems, and plumbing fixtures. In an effort to determine whether drinking water consumed on campus poses a potential health risk, Marquette University (Marquette) retained The Sigma Group, Inc. (Sigma) to perform drinking water sampling on Marquette's Milwaukee campus. Marquette and Sigma collaborated to identify twenty-eight campus facilities for drinking water sampling based on building ages, populations served, and presumed drinking water consumption. Specific sampling locations were selected based on building population estimates, presumed frequency of consumption, and our experience with similar projects. Sampling activities were completed between June 1, 2017 and July 14, 2017.

2. SCOPE OF WORK

Drinking water sampling was conducted between June 1 and July 14, 2017 in the following Marquette facilities:

- Straz Tower (Residence)
- Straz Tower (Rec Plex)
- Straz Tower (Administration)
- Sensenbrenner Hall
- Eckstein Hall
- Marquette Hall
- Business Administration (David A. Straz Hall)
- Raynor Library
- Memorial Library
- Schroeder Complex
- Marquette Gymnasium (Navy ROTC / Army ROTC)
- Rec Center (Helfaer)
- School of Dentistry
- Mashuda Hall
- O'Donnell Hall
- Humphrey Hall
- Childcare Center
- Physician Assistant Program (1700 Building)
- Campus Town East
- Campus Town West
- McCabe Hall
- McCormick Hall
- Union Sports Annex
- Alumni Memorial Union
- Schroeder Hall
- Abbotsford Hall
- Al McGuire Center
- Cobeen Hall
- 707 Building (Old Line Life Insurance)
- Carpenter Tower

During an initial walkthrough of each building, Sigma personnel identified drinking water fixtures readily available to students and staff. Drinking fountains and kitchen sinks were considered priority sampling outlets, as these would most likely be utilized for water consumption.

Sigma simulated typical overnight inactivity by following sampling protocols described in the Environmental Protection Agency's (EPA) "3Ts for Reducing Lead in Drinking Water in Schools". Each fixture identified for sampling was flushed for two minutes prior to posting a notice that the fixture was out of service and should not be used. The following morning, first draw water samples were collected at each location and were submitted under chain of custody to a Wisconsin certified laboratory (Environmental Monitoring and Technologies, Inc.) for drinking water Method E200.8 lead analysis.

3. REGULATORY DISCUSSION

The EPA has established a maximum contaminant level goal (MCLG) for lead of zero. An MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals. The EPA established the MCLG for lead at zero based on studies which show there is no safe level of exposure to lead. EPA's Lead and Copper Rule (LCR) establishes a treatment technique requiring water systems to control corrosivity of the water distributed and to collect tap samples for lead analysis. If more than 10% of the water samples contain lead concentrations above the established action level of 15 ug/L (15 ppb) then water systems are required to reduce consumer exposure to lead.

4. SUMMARY OF RESULTS

The drinking water sampling results for the monitoring conducted at Marquette are provided in Table 1. Laboratory analytical reports are included in Appendix A and photos of sampled fixtures are included in Appendix B.

Over the course of the sampling events, Sigma collected a total of 281 drinking water samples. Of the 281 samples collected:

- 78 samples (~28%) were below the laboratory detection limit (<0.0700 ppb)
- 144 samples (~51%) were between the laboratory detection limit and 1.0 ppb
- 51 samples (~18%) were between 1.0 ppb and 5.0 ppb
- 5 samples (less than 2%) were between 5.0 ppb and the action level (15.0 ppb)
- 3 samples (~1%) were above the action level (15.0 ppb)

  Note: All three samples above action limit were collected from the same fixture

The lead concentration in one of the five drinking water samples collected in the administrative portion of Straz Tower on June 28, 2017 exceeded the drinking water action level of 15 ug/L for lead. This result was reported to Marquette as soon as results were made available, and it is Sigma's understanding the water to the fixture was shut down as a precaution. Three additional samples were collected from the same fixture on July 14, 2017 in an attempt to determine if the elevated lead levels were from the fixture or interior plumbing. Two of the three follow-up samples exceeded the

action level. It is unlikely that the municipal water supply from the street is the source of the lead due to the fact lead was not detected in locations sampled nearby (unless there are multiple water supply laterals feeding the facility).

Lead was detected at concentrations less than the drinking water action level of 15 ug/L in all other buildings and locations tested. Follow-up drinking water sampling was not conducted at fixtures with initial results below the action level.

5. RECOMMENDATIONS

Based upon visual observations and analytical results showing less than 10% of the samples collected exceeded the 15 ug/L action level, Sigma recommends the following:

- Replace/remove the Straz Tower fixture with lead concentrations greater than 15 ug/L

- Develop a maintenance program consisting of cleaning debris from screens and aerators, flushing fixtures used infrequently, and sampling fixtures that may be suspect due to age, condition or other concerns

6. QUALIFICATIONS OF REPORT

The findings and recommendations included herein are based on information obtained during the June and July 2017 sampling events. The intent of this focused drinking water evaluation was to generally identify if lead is or may be present in drinking water in Marquette buildings. This limited evaluation should not be interpreted as a comprehensive evaluation of all accessible or inaccessible drinking water fixtures/outlets. Locations and fixtures not specifically mentioned in this report were not evaluated.