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*Chemical Engineering /
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PROPOSAL FOR LEAD AND COPPER CONTROL STUDY

For the City of La Crosse

Proposal for Lead and Copper Control Study

For the City of La Crosse

Report Versions

Date	Version	Comments
6/27/19	1.0	Sent to City of La Crosse

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About Process Research Solutions, LLC

Process Research Solutions, LLC, is an engineering consulting firm specializing in water quality investigations for drinking water in municipal water systems and in building plumbing.

The company has also developed tools and protocols to pro-actively monitor and control water quality, lowering the chances of developing serious and expensive issues in water systems. This includes the strategy and equipment for monitoring in water distribution systems to gather comprehensive, consistent, and representative water samples. The monitoring technique and resultant comprehensive perspective of water quality are demonstrated in the Water Research Foundation Project 4586 report published in November 2017.

Data management computer software, My Monitoring Data®, has been developed by Process Research Solutions so that water quality and water system data can be quickly interpreted and utilized.

Section 1: Background

In 2017, the Wisconsin Department of Natural Resources (WDNR) began working with Wisconsin's twelve water systems serving populations over 50,000 to re-assess the effectiveness of lead and copper corrosion control. Additional water quality parameter sampling was required. For the City of La Crosse, outcomes of the sampling were discussed with WDNR on April 23, 2019. Sequential sampling of residences was planned to follow up on continued investigation. On May 31, 2019, the WDNR sent a letter to the City with a timeline of further investigation leading to a "Demonstrative Corrosion Control Treatment (CCT) Study". The timeline is listed below:

Task	Deadline
CCT Study Proposal Due	10/31/19
CCT Study Proposal Meeting	12/2/19
CCT Study Proposal Finalized	12/31/19
CCT Study Approval	1/31/20
CCT Study Progress Meeting	12/1/20
CCT Study Completed	12/31/21
CCT Planned Modifications Completed	12/31/23

Process Research Solutions, LLC, of Madison has been asked by the City to recommend steps to achieve the goals and deadlines set by WDNR. Process Research Solutions' expertise is with lead and copper control as well as other water quality issues of drinking water distribution systems. The company's work with Lead and Copper Rule compliance began in 1992 when the Rule was first published.

Section 2: Scope, Costs, and Timeline

The approach to lead and copper control taken by Process Research Solutions is demonstrated in Water Research Foundation Project 4586: Optimization of Phosphorus-Based Corrosion Control Chemicals Using a Comprehensive Perspective of Water Quality. A comprehensive perspective of water quality is used to collect information and interpret the information from a water distribution system. This contrasts to regulatory directives which are overly simplistic and do not take into account a number of factors that can play a role in the release of lead and copper from pipe walls. Many of the factors are not affected by the regulatory treatment directives of pH and alkalinity adjustment, calcium hardness adjustment, or the addition of phosphate or silicate-based corrosion inhibitors. In a CCT Study guided by Process Research Solutions, techniques are used to determine empirically what shapes the water quality in a specific distribution system, including what affects the release of lead and copper. The CCT Study includes the requirements of the WDNR but goes beyond those requirements to better address the control of lead and copper release.

A CCT Study with Process Research Solutions involves 3 stages:

- Stage 1
 - Evaluation of existing regulatory and other water quality data.
 - Evaluation of the system configuration and operations.
 - Chronology of operational changes.
 - Establishment of a “living” (on-going) evaluation that continues to indicate the status of the water quality, including lead and copper release, and can be presented as part of a Lead and Copper Rule desktop study at any time in the future.
 - Guidance regarding analyses to be performed with profile sampling of residences and confirmation of protocols. (Profile sampling of three residences has already been planned by La Crosse personnel.)
 - Guidance for possible analysis of harvested pipes from the distribution system.
 - City of La Crosse to provide materials inventories and coordinate the reporting for the Stage 1 CCT report
 - City of La Crosse to discuss customer complaint history and coordinate reporting for the Stage 1 CCT report.
 - Preparation of a draft Stage 1 CCT report.
- Stage 2
 - Desktop evaluation of all treatments described in s. NR 809.543(3)
 - Design of the distribution system monitoring and/or offline testing with cost estimate, protocols, etc.
 - Preparation of Stage 1 and 2 CCT report as described in WDNR letter of May 31, 2019.
 - Meeting with WDNR.

- Finalize the Stage 1 and 2 CCT report.
- Stage 3
 - Implementation of the monitoring and/or offline testing program.
 - Report and conclusions.

Stages 1 and 2 are to be completed by December 31, 2019. It is recommended that work begins as soon as possible.

Stage 3 is to be completed by December 31, 2021. The details of Stage 3 will be developed in the Stages 1 and 2 report with scope, protocols, costs, and timelines.

Costs are to be billed by hours worked and approved expenses. For Stages 1 and 2, set aside 100 hours x \$135 per hour = \$13,500 for possible engineering hours. There is a possibility that budget will be remaining for beginning of Stage 3.

Expenses are additional to the engineering hours.

- If a site visit is required, mileage will be billed at the IRS rate of \$0.58 per mile. Mileage for a site visit is estimated at 325 miles (\$188.50).
- If a hotel is needed, assume \$150 per night.
- The cost of analysis of chemical scales on a harvested pipe can run from \$900 to \$1500 per sample including shipping.
- Costs of laboratory analyses of water samples will be determined as planning proceeds. Various laboratories can be contacted for competitive pricing. Laboratories can be paid directly or, in some cases, through Process Research Solutions.