EXTERNAL GUIDANCE (EG) for the Water Supply Division (WSD)-Plan and Technical Review (PTR) Section

Title: Follow-up Engineering Corrosivity Report Outline Submittal Guidance

Responsible Team / Section / Program: Plan Review Team / PTR Section

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Section Manager

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Follow-up Engineering Corrosivity Report Submittal Guidance

Acronyms and Definitions

Term	Definition
PWS	Public Water System
PE	Professional Engineer
CCST	Corrosion Control Study
C	Corrosive
NC	Non Corrosive
SC	Slightly Corrosive
LCR	Lead and Copper Rule
EP	Entry Point
ALE	Action Level Exceeder
TCEQ	Texas Commission on Environmental Quality
TAC	Texas Administrative Code
WQP	Water Quality Parameter

Regulatory Reference

Internal Corrosion Control in Water Distribution Systems Manual of Water Supply Practices, AWWA M58. [Ref. EPA's OCCT, Appendix F Section F2 and AWWA M58, pp. 109-128].

TCEQ Contact Information

Plan Review Team, MC-159
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Background

Requirements Related to Slightly Corrosive or Aggressive/Corrosive Water

Plan review approval of new sources or treatments that affect water quality may require public water systems (PWS) to submit a follow-up engineering corrosivity report as a condition of approval. This report submittal guidance was developed as a guide for the contents of such engineering reports submitted by a Texas Professional Engineer (P.E.) on behalf of a PWS. **This guidance is not intended for lead or copper action level exceeders (ALE) that are required to prepare a Corrosion Control Study (CCST) under the Lead and Copper Rule. Please note that if a PWS becomes an ALE, they should contact the Plan Review Team at (512) 239-4691.**

A PWS that is a lead and Copper ALE is required to submit a Source Water Treatment Recommendation, Optimal Corrosion Control Treatment Recommendation and Corrosion Control Study (CCST), please contact a member of the Drinking Water Quality Team for additional guidance at (512) 239-4691.

Follow-up engineering corrosivity reports related to slightly corrosive or corrosive/aggressive water required by the Plan Review Team should be submitted to the following address:

Plan Review Team (MC 159)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Guidance

Engineering Report Content

1. Historic and Current System Information

When reviewing the corrosive nature of water at a particular water system, it is necessary to have historical data for review. The following is a general guideline for gathering and presenting the necessary historical baseline data to include within the required engineering report.

a) Provide known information of the current distribution and service lines, including pipe material, pipe sizes, and age of piping. Include how this information has been obtained such as record drawings, waterline replacement projects from the past, and purchase orders.

b) Provide a write-up and schematic on the current water treatment process; provide a historical perspective of the major changes to the treatment process with dates and reasons for the process changes.

c) Include a summary of all historical information and Water Quality Parameter (WQP) data such as lead, copper, conductivity, total dissolved solids, pH, temperature, alkalinity, chloride, sulfate, calcium and sodium. Provide a complete description of when and why the data was collected and provide any context as it relates to system changes such as changes in treatment systems.

d) Provide information on whether the PWS has a history of lead and/or copper sampling issues and exceedances.

e) Research analogous system data that use the same sources and use similar treatment process.

2. WQP Sampling and Results

The follow-up engineering corrosivity report was triggered because the PWS is in the process of making changes such as adding a new source or process treatment changes that can have an effect on the corrosivity of the finished water. The goal of the report is to study the changes in WQP data to see the effect of the change on the system as a whole.

a) Provide WQP sample data from all entry points and distribution sites as a whole that reflects the change in treatment or source. Provide complete WQPs after the treatment modifications including the date of the process modification.

b) Provide the analytical lab results for the reported WQP data, including appropriate chain of custody with Quality Assurance/Quality Control data. Please note that pH and temperature should be taken in the field at the

time of sampling. Provide the 'field pH and temperature' associated with the WQP sampling.

c) Provide whether the PWS has elevated lead, copper, aluminum, iron or manganese levels at the Entry Point (EP). This data may affect any corrosion control treatment if required.

d) Perform corrosion indices calculations using the current WQP data after the change was initiated.

e) If the water is corrosive, then the engineering report must provide the type of treatment recommended including: type of chemical, dosage, residual and reason for the recommended treatment.

3. Lead and Copper Sampling

a) The system may be required to conduct lead and copper tap sampling as part of the plan submittal. This sampling is part of the LCR program and scheduled by LCR staff. If the system was required to do lead and copper tap sampling, please include the results as part of the follow-up engineering corrosivity report with a discussion of the results.

b) Please note that if a PWS becomes an ALE during this required sampling, they should contact the Plan Review Team at (512) 239-4691.

c) The follow-up engineering corrosivity report is due after the first six-month LCR tap sampling is required. If the system is not required to do LCR tap sampling (such as a wholesaler or Noncommunity – Transit System), the report is normally dues six months from the date of the plan approval letter.

d) Under the LCR rule, PWSs are not considered an ALE unless more than 10% of the samples exceed the threshold set by EPA. (The lead action level is 0.015 milligrams per liter (mg/L) and the copper action level is 1.3 mg/L). However, the follow-up engineering corrosivity report should include a discussion of each sample that exceeds the threshold. The discussion should address:

   a. Whether a retest was done and what the results were;

   b. History of sampling for the particular site;

   c. Any special circumstances for the site (e.g. lead service line, copper plumbing with high lead solder); and

   d. Whether a POU (such as a lead removal filter) was offered and being used at the site.

4. Future Planning

If the PWS is planning near future projects, those projects may affect water corrosivity and may change the recommendations and conclusions of the current data.

a) Include a section that discusses future planning that the system is considering such as new wells or treatment changes. Discuss how these future changes may affect the corrosivity of the finished water and whether the recommendations and conclusions include consideration of such future projects.

5. Analysis and Technical Tools

The follow-up engineering corrosivity report must include an analysis of the WQP data. The engineer should calculate the following indices for the WQP data. Formulas for the indices can be found in reference manuals or online. TCEQ uses the Tetra Tech (RTW) Model for Water Chemistry, Process, and Corrosion Control to look at water quality parameters and evaluate treatment processes. The engineer is not required to use the RTW model.

CRITERIA TABLE

Langelier Index	(NC equal or greater than -0.25, SC less than -0.25, C less than -1.0)
Ryznar Index	(NC less than 7.0, SC between 7.0 and 8.5, C greater than 8.5)
Aggressiveness Index	(NC greater than 12, SC between 10 and 12, C less than 10)

The corrosivity of the original water parameters is calculated with assumed temperatures of 10 °C and 25 °C, giving six grades.

- If 5 or 6 of the grades are NC, the water is considered non-corrosive;
- If 2 or more of the grades are C, the water is considered corrosive;
- Otherwise, the water is considered slightly corrosive.

6. Conclusions and Recommendations

a) The follow-up engineering corrosivity report must determine if the corrosiveness of the water may or may not be a problem to the particular system. The engineer needs to review all the data and either recommend new corrosion control treatment, adjust existing corrosion control or provide a detailed explanation why no new or changes to existing treatment is required.

b) For new and existing corrosion control treatment changes, the engineer needs to evaluate the treatment change to ensure that it is in accordance with the EPA OCCT. EPA's current OCCT recommendation document can be accessed from the following EPA web link: https://www.epa.gov/sites/production/files/2016-03/documents/occtmarch2016.pdf

c) The document's Appendix B and Chapter 3 flowcharts can be used to determine the likely corrosion control treatment to work.

d) For new and existing corrosion control treatment changes, the engineer needs to submit plans and specifications to the Plan Review Team for review and approval.

e) New and existing corrosion control treatment change approvals may result in the PWS being required to conduct more monitoring and to make updates to the follow-up engineering corrosivity report.

Available Resources

The engineer can get information from:

1. Drinking Water Watch:
   https://dww2.tceq.texas.gov/DWW/

2. TDLR Drilling reports:
   http://www.twdb.texas.gov/groundwater/data/drillersdb.asp

3. TWDB Ground water Database:
   https://www2.twdb.texas.gov/apps/WaterDataInteractive/GroundWaterDataViewer

   If you find the well and click on it, a blue link in the description that pops up opens a window. Click on scan. Sometimes you find the well report and chemical testing.

4. Central Records Search. Sometimes you can find 60's health survey that tells the well information. A searchable index of all records housed in our central file room in Austin can be viewed at the following link:

   https://records.tceq.texas.gov/cs/idcplg?IdcService=TCEQ_SEARCH

   See our **guidelines on how to use Central File Room Online**.
   https://www.tceq.texas.gov/assets/public/agency/How-to-Use-Central-File-Room-Online.pdf