STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

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Drinking Water Section

APPROVAL FOR CONSTRUCTION OR INSTALLATION OF WATER AND TREATMENT WORKS

Date: July 19, 2022

To: Lori Mathieu, Public Health Branch Chief

From: Austin McMann, Sanitary Engineer III

Via: Mandy Smith, Supervising Sanitary Engineer

Public Water System: Dr. Helen Baldwin School
PWSID #: CT0221122
Town: Canterbury
DPH Project #: 2022-0021

Project Name: Addition of Orthophosphate for OCCT

Date(s) of Project Submission: February 1, 2022, May 4, 2022

Project Description: The following is a brief project description and is not inclusive of all project components.

Dr. Helen Baldwin School (DHBS) is a public water system in Canterbury, CT. The system exceeded the 90th percentile lead action level in the monitoring period of January 1, 2019 – December 31, 2021. As a result Administrative Order Number DWS 21 – 022 – 039 was issued on November 19, 2021 to comply with the requirements of the Lead and Copper Rule (LCR). In response to Item 9, outlined in the aforementioned order, an optimal corrosion control treatment (OCCT) recommendation was submitted by James Majewski of LaFramboise Water Services on February 1, 2022 . The Department of Public Health (DPH) Drinking Water Section (DWS) has reviewed the OCCT recommendation. The review was conducted pursuant to the requirements under the Regulations of Connecticut State Agencies (RSCA) Section 19-13-B102(j) and the U.S. Environmental Protection Agency's (EPA) Optimal Corrosion Control Treatment Evaluation Technical Recommendations, which provides technical recommendations that can be used to comply with the LCR's corrosion control treatment (CCT) requirements and which can aid effective evaluation and designation of CCT to achieve OCCT.

This project consists of the installation of a chemical injection system for the addition of orthophosphate for corrosion control. In the proposed system, raw water from the system's two wells will combine and be treated with orthophosphate before entering the system's existing atmospheric storage tank. A static mixer will be provided after the injection location to ensure even mixing. The proposed orthophosphate is Carus 3180 which is manufactured by Carus Chemical and is certified to meet NSF/ANSI Standard 60 for use in drinking water. The orthophosphate chemical injection pump will be paced to the flow of the raw water and will be adjusted to inject the orthophosphate solution at a pace appropriate to maintain a long term orthophosphate point of entry residual range of 1.0 to 3.0 mg/L of orthophosphate as PO_4 with a target of 2.0 mg/L as PO_4.

Disclaimer: This approval for construction or installation only covers applicable public drinking water regulations and guidelines of the DPH and the EPA. The DPH's approval for construction or installation does not guarantee that the proposed treatment and/or components to be installed as part of this project will operate as proposed or achieve the proposed treatment objectives. This approval additionally does not cover approvals or permits which may be necessary by other state or local agencies.

This project is approved for construction or installation in accordance with the following terms:

1. Based on the system's water quality parameters (WQP), the proposed CCT is one of the recommended treatments for CCT in the EPA's technical recommendations to achieve OCCT. In addition, other water qualities that may impact corrosion were assessed by the systems certified operator, Paul Laframboise, who concluded that the addition of orthophosphate is the appropriate and effective CCT to achieve OCCT for DHBS. Therefore, the proposal is accepted by the DPH DWS to achieve OCCT.

2. This project is approved for construction based on the project being constructed in accordance with received plans, specifications, project applications, and additional information dated February 1, 2022, and the DPH terms stated herein. Any substantial deviation from the approved design must be reviewed and approved by the DPH in accordance with Section 19-13-B102(d)(2) of the RCSA. Failure to do so may result in an enforcement action and possible reconstruction of the project to conform to the DPH's technical approval.

3. The project must be installed no later than September 17, 2022.

4. All work implemented for this project must be effectively disinfected pursuant to Section 19-13-B47 of the RCSA. Upon completion of the project and prior to placing into active use, the water must be sampled and tested for at least total coliform bacteria and chlorine residual to verify that the work completed was effectively disinfected. All test results must be in compliance of Section 19-13-B102(e) of the RCSA, indicate the water is safe for consumption and be submitted to the DPH.

5. The Sampling Site Plan, which can be found on the DPH's website, must be completed for the distribution system WQP required as a result of this project (see item 4 below) and submitted to the DPH.

6. After construction/installation is completed for this project and prior to placing the project into active use, a Certification of Completed Water or Treatment Works Construction/Installation form, which can be found on the DPH's website, must be completed and submitted to the DPH along with the water test results and the completed Sampling Site Plan as required.

7. The DPH must be contacted to make arrangements for an inspection of the project or project components prior to active use. Submission of photos may be substituted for the inspection upon concurrence with the DPH.

8. The project should not be placed into active service until an Acknowledgement of Project Completion correspondence is received from DPH.

9. A Water Treatment Plant Classification which includes the proposed treatment was received. Based on a review of the form the water treatment plant is classified as a Class I Water Treatment Plant. The system's current water system certified operator, Paul LaFramboise is certified to at least or above this class level.

Requirements after installation of treatment:

1) The distribution system pH must be no less than 7.0 at all times pursuant to RCSA Section 19-13-B102(j)(8)(F)(i)(II).

2) The orthophosphate as PO_4 residual at the entry point must be maintained within the proposed values of 1.0 – 3.0 mg/L.

3) Pursuant to RCSA Section 19-13-B102(e)(7)(N)(i), the following must be measured at the entry point after installation of the corrosion control treatment:
    a. Every week – pH (measure on site)
    b. Every two weeks – Orthophosphate as phosphate
    c. Every two weeks – Dosage rate for Carus 3180, submit upon request only

4) Pursuant to RCSA Section 19-13-B102(e)(9)(C), two sets of samples at one site in the distribution system during each six month monitoring period for the following WQP must be measured after installation of the corrosion control treatment:
    a. pH (measure on site, report to lab for EDI submittal)
    b. Alkalinity
    c. Orthophosphate as phosphate

    Note: Distribution system tap samples must be representative of the water quality throughout the distribution system; therefore, should be collected at the ends of the distribution system for this system. Samples should not be collected at the same time. Each set of samples should be collected at least quarterly to capture variations.

Recommendations and Comments:

1) DHBS should continue to evaluate the WQP and treatment effluent quality routinely to ensure that the proposed treatment to achieve OCCT is operating properly and effectively.

2) It is strongly recommended that additional sampling sites be monitored for WQP in the distribution system to capture seasonal variations and to ensure all ends of the distribution system are receiving the proper residual to provide effective corrosion control.

3) A redundant metering pump or spare parts should be available on site to prevent interruption of treatment, if not already available.

4) According to the EPA's OCCT guidance and the system's water quality parameters, the theoretical saturation pH is about 7.8. Therefore, the maximum adjusted pH should not go above 7.8 to minimize the potential for precipitation of calcium carbonate (scaling) in the distribution system, which may increase metal release.

5) Please note that by using phosphate without disinfection, there is a risk for bacteria growth in the distribution system. If a bacteria violation is incurred with the phosphate treatment, then disinfection may be necessary.