

# J.R. Holzmacher P.E., LLC

3555 Veterans Memorial Highway, Suite A, Ronkonkoma, New York 11779-7636  
Tel: (631) 234-2220 Fax: (631) 234-2221 e-mail: info@holzmacher.com

April 10, 2022

Kristine L. Wheeler, P.E., Director  
Bureau of Water Supply Protection  
NYS Department of Health  
Empire State Plaza  
Corning Tower  
Albany, NY 12237

Re: Inc. Village of Hempstead - Progress Report  
for 1,4 Dioxane MCL Deferral – Q1 2022  
Public Water System ID# 2902827

Dear Director Wheeler:

We are the consulting engineer to the Village of Hempstead Water Department and we write on its behalf. This summary report of activities is submitted in compliance with the requirements listed in your letter dated January 8, 2021, which granted a deferral for enforcement of the 1,4 Dioxane Maximum Contaminant Level (MCL). Continuation of the Deferral was based on the Village meeting the conditions listed in your letter.

## **Condition 1**

Condition 1 required that public notification be made within 30 days of your letter. The Village had the notice published in the Hempstead Beacon on January 22, 2021. The receipt and confirmation of publication was attached for your records with the 2021 Q1 report.

## **Condition 2**

Condition 2 required preparation of this quarterly progress report and submission to NYSDOH by the 10<sup>th</sup> day of the month following each calendar quarter. This report is therefore due by April 10, 2022 for the first quarter in 2022.

Activities during the first quarter of 2022 included progress in advancing with AOP treatment pilot work with two different systems as well as design work on the full scale AOP treatment building and site infrastructure as described in detail below. A third area of activity includes accelerating efforts to drill test wells for a third water plant at one of the few open parcels remaining within the village.

Water Plant treatment pilot activities continued with pursuing additional AOP treatment systems during the first quarter of 2022 based on inadequate pilot results generated early in 2021. As described in the 2021 fourth quarter report the Village water system faces several challenges not impacting most other water suppliers. The Village wells have relatively high concentrations of iron relative to the surrounding water suppliers impacted by 1,4 Dioxane. The two wells located at the Laurel Avenue plant are treated by a manganese green sand iron removal filter. The seven

wells located at the Clinton Street water plant have had iron reduction as a byproduct of other aeration processes which has generally removed about half of the iron with no additional treatment.

The Village of Hempstead has an unusual problem compared to most other water suppliers on Long Island in that it is impacted by VOCs originating from the Roosevelt Field groundwater plume, while also having high concentrations of iron. The 1,4 Dioxane impacting Clinton Street seems to overlap that plume. Iron concentrations tend to increase for wells located further south on Long Island, while VOC contamination, and the coinciding 1,4 Dioxane contamination, is much less common in the southern portion of the Magothy Aquifer. Other Long Island wells impacted with 1,4 Dioxane tend to have lower concentrations of iron. The Clinton Street water plant has two existing air stripping towers (ASTs) to remove the VOCs.

The initial pilot was the Purifics Water, Inc. Advanced Oxidation Process (AOP) pilot system, based on titanium dioxide (TiO<sub>2</sub>) activated with UV light, with an iron removal aeration and prefilter system. This system did not yield acceptable results but is still on site for sampling by the manufacturer at no additional cost to the Village.

The Village has negotiated proposals for rental of pilot units with two separate AOP vendors to hasten the implementation of full scale AOP treatment. Arrangements have been made to send bench scale water sample to APT Water to evaluate chemical demand associated with their ozone-hydrogen peroxide AOP system, and for the arrangement for rental of a pilot scale treatment unit. The Village has signed a proposal for the bench scale testing and are awaiting the supplies from APT Water to send samples to their facility from each well. There was discussion with the NCDOH prior to the signing of the proposal about what to test for in the water pre and post treatment since the NCDOH has not seen an AOP using O<sub>3</sub>/H<sub>2</sub>O<sub>2</sub> operate before. Because this system is known as a 'dark' system (does not use UV light) it is anticipated that iron and calcium will not adversely impact the system.

The Village is also finalizing arrangements to begin testing with the Trojan Technologies pilot system using UV/H<sub>2</sub>O<sub>2</sub>. The engineering report was submitted to the NCDOH, along with the pilot sample plan, and the Village has recently received comments back from the NCDOH. Most of the AOPs that have been implemented in Nassau County have been UV/H<sub>2</sub>O<sub>2</sub> systems, so the NCDOH is much more familiar with this system and its operations than the O<sub>3</sub>/H<sub>2</sub>O<sub>2</sub> system. It is likely that the iron and calcium deposition will adversely impact that system as well at the Clinton Street Plant so only the lower iron wells will be utilized. Use of the Purifics CUF in line with the Trojan AOP system may also be possible at this time. It is intended to start the Trojan pilot testing at the Laurel Avenue Plant since these wells are treated for iron, although the lower concentrations of 1,4 Dioxane pose some difficulties for analysis of pilot data. The pilot would use water effluent from the existing iron removal filters and AST so it would be comparable to future water quality from the Clinton Street wells should a conventional manganese greensand filter unit be constructed at Clinton Street.

Although the pilot work has not been completed, work has commenced on design of site improvements and a new building to house the full scale AOP treatment system. The layout of the building has been completed with approval from the Village Water Department and the remaining design work is being completed in parallel. The building is has been designed with a “W” shaped pipe trench which surrounds the new AOP treatment areas. The dimensions of the final AOP equipment are being estimated in negotiations with multiple equipment manufacturers. The building will be constructed with large roll up doors so that skid mounted AOP equipment can be installed after the building is constructed, and the pipe trench configuration will allow flexibility in the final piping configuration. Plans for the building will be submitted for NCDOH review and it is expected that the building will be bid and in construction before the final AOP pilot data and the AOP mechanical design is approved by NCDOH.

The Village is continuing to pursue alternate supply options as described in the fourth quarter report. It is believed that any new wells located in the southern portion of the village will have better water quality as other water suppliers to the south are not yet impacted by 1,4 Dioxane.

A third water plant has been planned for decades to be collocated with Kennedy Park in the southeastern part of the Village. The Village made application to the New York State Department of Environmental Conservation (NYSDEC) for two 1,500 gpm wells at Kennedy Park and was issued permits. The Village identified a slice of unused land at the High School, near the southwest village boundary, as perhaps the only other suitable parcel for well construction. Negotiations with the School District commenced several years ago and have finally resulted in permission to drill two test wells. The final details of a site access agreement were negotiated during the fourth quarter and we are awaiting final execution of a written agreement.

These new well permits have previously been approved at Kennedy Park. The engineering report and permit applications have been updated to reflect Hempstead High School as the new water plant location. A revised engineering report and permit applications have been submitted to the NYSDEC to transfer the well permits from Kennedy Park to the Hempstead High School. We are awaiting approval from NYSDEC. A similar application has been prepared and submitted to NCDOH for approval of the test wells and permanent wells, and plans and specifications for the well work are complete and will be bid upon receipt of approval. We are awaiting approval or comments on the design plans and specifications from NCDOH.

Preparation of permit applications and engineering report for the blending of well water is underway. The Village is blending the well water to reduce the levels of 1,4 Dioxane in the delivered water until AOP treatment can be fully implemented.

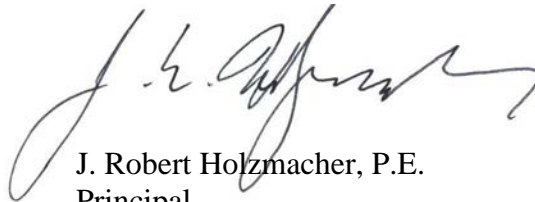
### **Condition 3**

Condition 3 required documentation if exposure mitigation measures cannot be implemented. Currently the Village of Hempstead is in compliance with the exposure minimization measures

stipulated in the deferral application. These include deferring use of wells having higher concentrations of 1,4 Dioxane and mixing the water from the wells with elevated concentrations of 1,4 Dioxane with wells that have lower levels of 1,4 Dioxane. Trace concentrations of 1,4 Dioxane are present in the water distributed to the residents since seven out of the nine wells have levels of 1,4 Dioxane above the MCL. It is impossible for the Village to distribute water to their residents below the MCL without at least one full scale AOP treatment unit in operation because the water demand is high and cannot be met with only two wells. The Village is working as quickly as they can to find the most suitable AOP treatment units to implement at the water treatment plants and to bring alternate sources of water supply on line.

Please call me if you have any questions or comments.

Sincerely,  
**J. R. Holzmacher, P.E., LLC**



J. Robert Holzmacher, P.E.  
Principal

JRH/sc

Encl.

CC: Steve Giardino, Supervisor  
Matthew Spinelli, Assistant Supervisor

q:\2022\hempv\22-01 retainer\correspondence\nysdoh\mcl deferral\compliance reports\q1\hempv deferral progress report 2022 q1.doc