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January 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 – Q4 2021
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 Q1 report.

Condition 2

Condition 2 required preparation of this quarterly progress report and submission to NYSDOH by the 10th day of the month following each calendar quarter. This report is therefore due by January 10, 2022 for the fourth quarter.

Activities during the fourth quarter of 2021 included a shift in AOP treatment pilot work 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 shifted direction during the fourth quarter of 2021 based on inadequate pilot results generated earlier in the year. As described in the third 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 (TiO₂) 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 are being negotiated to send bench scale water sample to APT Water to evaluate chemical demand associated with their ozone-hydrogen peroxide AOP system.

The Village is currently making arrangements to begin testing with the Trojan Technologies pilot system using UV/H₂O₂ and a pilot sampling plan is being prepared. It is likely that the iron and calcium deposition will adversely impact that system as well 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. A second round of pilot testing using the Trojan system is also being planned for the Laurel Avenue Plant although the lower concentrations of 1,4 Dioxane pose some difficulties for analysis of pilot data. That pilot would use water effluent from the existing iron removal filters and AST so would be more similar 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 building is being 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 third 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.

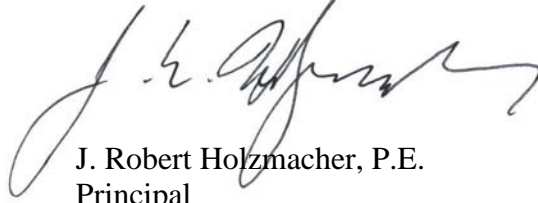
Condition 3

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.

Kristine L. Wheeler, P.E.
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Sincerely,
J. R. Holzmacher, P.E., LLC



J. Robert Holzmacher, P.E.
Principal

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Encl.

CC: Mike Taylor, Supervisor
Steve Giardino, Assistant Supervisor

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