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June 14, 2016

Ms. Sandra J. Farmer  
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Subject: City of Walnut Ridge, Arkansas  
NPDES Permit No. AR0046566, AFIN: 38-00040  
NPDES Effluent Violations

Dear Ms. Farmer:

On behalf of the City of Walnut Ridge, Crist Engineers, Inc. is responding to your letter dated May 6, 2016, regarding a request to initiate a Corrective Action Plan (CAP) as a result of six (6) effluent violations.

On May 26<sup>th</sup>, 2016 a site visit was made to the wastewater treatment facility where an examination was made of the treatment process and a review of microbiological process was conducted. Grab samples were microscopically evaluated at several steps throughout the biological process, including the influent, aeration basin, return activated sludge, and the effluent prior to chlorination. This initial, cursory examination, gave indication of a biomass in stress. Healthy biota of nitrifying and denitrifying bacteria were not readily present, which would substantiate elevated levels of ammonia nitrogen and total suspended solids, as well as, present a potential presence of quaternary ammonium compounds (Quats). Quats have a biocidal effect on wastewater which have common uses in disinfectants, sanitizers, and surfactants. Quats are strongly cationic that attach to both organic and inorganic compounds and have a long lasting biocidal effect. Common sources are hospitals, restaurants, and nursing homes where strong disinfectants are commonly used.

As an initial evaluation, grab samples were obtained at a point in the collection system, influent, aeration basin, and the return activated sludge on the day of the site visit. These samples were tested for Quats. The results of the Quats testing became available on June 7, 2016. Results ranged from 2.0 at the effluent to 12.83 mg/L in the return activated sludge. Nitrification inhibition for Quats occurs at 2 to 5 mg/L; therefore we can surmise that current levels are having an inhibitory effect on the biomass. Based upon ongoing plant performance and the microbiological activity, a more thorough determination of Quats should be initiated.

On June 2, 2016, results were presented for the 7-day chronic test during the week of May 16, 2016. Sublethal effects were measured for *Pimephales Promelas* and the *Ceriodaphnia Dubia*, which will require a re-test. The City of Walnut Ridge has scheduled the re-test sampling this week, with results anticipated the last week of June to the first week of August.

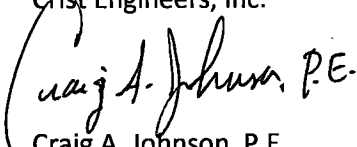
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In light of these cursory results and the sublethal test failures, a broader scope needs to be developed for a corrective action plan with an achievable milestone schedule. Testing equipment has been ordered by the City of Walnut Ridge to monitor pH and alkalinity, and an attempt will be made to air strip the Quats by raising the biomass pH with caustic. However, this effectiveness may be limited.

The City of Walnut Ridge respectfully requests an extension to develop the requested Corrective Action Plan in light of these findings by an additional 75 days so a comprehensive strategy can be developed to mitigate the Quats and potential toxicity findings of the whole effluent toxicity tests. This time period will allow the WET testing cycle to conclude and determine the effectiveness of the initial Quats identification process in the collection system and removal process at the wastewater treatment facility.

We sincerely appreciated this consideration. Should you have any questions, please do not hesitate to contact me.

Sincerely,  
Crist Engineers, Inc.



Craig A. Johnson, P.E.  
Associate

CC: Jon Kopp, Walnut Ridge Water Works  
Sam Gates, SG Labs



**Crist Engineers, Inc.**  
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Little Rock, Arkansas 72205

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