

Rennaker, Joanne (DEQ)

From: Cook, Pat (DEQ)
Sent: Friday, October 16, 2015 2:58 PM
To: Prysby, Mike (DEQ)
Subject: RE: PRELIMINARY & DELIBERATIVE. NOT SUBJECT TO FOIA: FW: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike – I had a chance to review the Flint WTP Corrosion Control proposal. While I did not spend a lot of time reviewing the attached plans, I did read the entire Basis of Design (BOD) and offer the following comments.

Since Flint will be obtaining water from DWSD that already has orthophosphate (PO₄) in it as a corrosion control measure, it makes sense for Flint to use PO₄ as well.

The water from DWSD will have approximately 0.3 – 0.4 mg/l orthophosphate as phosphate (P) as it enters the Flint supply. The BOD states that Flint will add PO₄ at one of two locations near the Flint WTP to increase the PO₄ levels prior to entering the Flint distribution system. According to EPA's *Revised Guidance Manual for Selecting Lead and Copper Control Strategies* orthophosphate is an effective corrosion control method if a residual of at least 0.5 mg/l orthophosphate as phosphate (P) is maintained in the distribution system. A 1.0 mg/l as P residual is preferable. It also states that the pH should be in the 7.2 – 7.8 range. A brief review of DWSD's MOR's reveals that the average pH at the DWSD plant taps is in the 7.2 - 7.4 range. In addition, Genesee County's WQP data shows that the pH in their distribution system is usually over 7.2, so maintaining an adequate pH range for PO₄ application in Flint should not be an issue. However, Flint should monitor the pH regularly at the connection points to DWSD and in their distribution system piping network to ensure that pH stays in the appropriate ranges and adjust them if needed.

Therefore, I concur with their proposal to feed PO₄ as a corrosion control strategy under the assumption that they add enough PO₄ to maintain a 0.5 – 1.0 mg/l as P in the distribution system. Also, they need to tell us what NSF Standard 60 product they plan on using.

Hope this helps - pat

From: Prysby, Mike (DEQ)
Sent: Friday, October 16, 2015 8:07 AM
To: Cook, Pat (DEQ)
Subject: PRELIMINARY & DELIBERATIVE. NOT SUBJECT TO FOIA: FW: Flint WTP PH2 SEG4 - Corrosion Control

Pat,

Attached is Flint's corrosion control proposal (BOD & schematic). I was told this is priority #1 for review/comment/approval. I will be reviewing this today for comment and/or permit issuance along with issuing the GCDC WTP permit...If you have an opportunity to take a look at the proposal and add any comments, as needed, that would be helpful. I'm out today at 11:00am; however, I don't foresee that happening.

Michael Prysby, P.E.
 District Engineer
 Office of Drinking Water and Municipal Assistance

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From: Matta, Samir [<mailto:SFMatta@lan-inc.com>]
Sent: Friday, October 16, 2015 12:02 AM
To: Prysby, Mike (DEQ)
Subject: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

Please see attached plans for the Corrosion Control Plan for the City of Flint. I will have the official submittal package to you tomorrow afternoon after I get Brent or Mike's signature on the permit application. I will call you when I get back in Lansing to drop the package. Is three sets of full size plans adequate? Would you like some half size plans? Let me know.

Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4 . Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that, at least initially, there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.

The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.

Please let me know if the information is adequate or you require additional information.

Thanks.

Samir F. Matta, PE
Team Leader



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& Newnam, Inc.**
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