

From: [Sygo, Jim \(DEQ\)](#)
To: [Shekter Smith, Liane \(DEQ\)](#)
Subject: FW: We need to discuss today
Date: Friday, October 30, 2015 9:07:19 AM

FYI

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Friday, October 30, 2015 8:58 AM
To: Sygo, Jim (DEQ)
Subject: We need to discuss today

Jim,

In the interests of time, I am sending over a comment from TF discussions directly. There are a few technical concerns about the permit issued to Flint. Could you consider the comment below and let me know your thoughts? It's important to all that we get this nailed down without delaying the feeding of corrosion control. Thanks.

There is a unit "issue" in the section of phosphate dosages. In our phone call the other day, DEQ indicate the units discussed were mg/L as P, when we questioned how much phosphate was being consumed in the Flint system from the Detroit water feed This also came up in a prior discussion on the phone Darren and I had with DEQ about observations of phosphate loss, even within Detroit. The recommendations Darren and I provided for an initial dose of a total amount of PO₄ (as PO₄), were that the target residual to the estimated theoretical point of diminishing returns to optimize phosphate (in lieu of having it be determined by actual pilot testing) should be in the 3-4 mg/L as PO₄ neighborhood, closer to 4.

At this time (but not when they change water supplies!) they only need to supplement the PO₄ coming from Detroit. Thus, the pumps to be installed should have the minimum capacity to dose to achieve the 3-4 mg/L as PO₄ level (1-1.3 mg/L as P), with extra capacity to achieve 4-6 mg/L as PO₄ (1.3 to 2 mg/L as P), to assure that they could overcome an estimated system pipe wall demand. So, the design max dosage for the pumps should be 6 mg/L as PO₄ – (the minimum amount of phosphate received from Detroit, in mg/L as PO₄). The minimum would be 3.5 to 5 mg/L as PO₄ – (the maximum amount of phosphate received from Detroit, in mg/L as PO₄).

I seem to recall that we were assured on our phone call the other day that the changes were being made to address our concerns, but that the units were in mg/L as P. Since the conversion factor of P to PO₄ is 3, then clearly, the target residual would be about 1-1.3 mg/L as P, but it looks like the units are PO₄ in this permit. They say the max design dosage would be 1.5 mg/L, which is still a little low, if the units truly are mg/L as P (4.5 mg/L supplement on top of received water). But I'm really confused by the level they say is received from Detroit, because they very explicitly say "as PO₄" in the engineering report that is the basis for the permit request, not as "P."

I'm thinking some water samples should be taken for alkalinity and orthophosphate (or total P, given it's a phosphoric acid product, for convenience of analysis and preservation) and have your R5 laboratory analyze them, so that we can be sure of the phosphate and alkalinity levels.

Sent from my iPhone