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Sent: Thursday, February 11, 2010 11:59 AM
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Subject: Phila. Water Dept. Comments on High Total Dissolved Solids Rule
Attachments: Phila. TDS Rule Final comments.doc

In the document attached below, the City of Philadelphia Water Department hereby comments on the Environmental Quality's Board's Proposed Regulation # 7-446 (#2806) to amend 25 Pa. Code Chapter 95, Wastewater Treatment Requirements, to address the discharge of wastewaters containing high Total Dissolved Solids.

Thank you for your attention

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2806

City of Philadelphia Water Department's Comments on the Environmental Quality's Board's Proposed High Total Dissolved Solids Rule

INTRODUCTION

The City of Philadelphia Water Department (PWD) hereby comments on the Environmental Quality's Board's (EQB) Proposed Regulation # 7-446 (#2806) to amend 25 Pa. Code Chapter 95, Wastewater Treatment Requirements, to address the discharge of wastewaters containing high Total Dissolved Solids (TDS) (Hereinafter the High TDS Rule)

PWD provides wastewater, drinking water and storm water services to over 2.2 million people in the City of Philadelphia and surrounding counties. Our three water treatment plants have a combined designed rated capacity of 546 million gallons per day (GPD). Our plants ensure the quality and safety of our finished drinking water through a multi barrier approach of which source water protection is a key element.

Similarly, PWD also has three wastewater treatment plants, referred to as Publicly Owned Treatment Works or POTWs,. Our POTWs have a combined design rated capacity of 522 MGD and can, during periods of wet weather, treat over one billion gallons of wastewater per day. Our POTWs consistently meet their NPDES permit requirements despite the ever increasing, complicated and costly challenges emerging under the Clean Water Act and Clean Streams Law.

Being a combined wastewater, drinking water and storm water utility the High TDS Rule will affect not only our POTWs but also the source water on which our drinking water plants rely. Therefore, PWD will divide its comments into two sections. First, we will address the impacts of the High TDS Rule on our POTWs. Secondly, we will comment on the Rule's impact on PWD's source water.

In summary, our message is as follows:

- From a drinking water and ecological protection perspective, PWD appreciates the state's efforts to address extremely high levels of TDS and chlorides from the disposal of high volume fracturing flowback water.

- For PWD to support the rule, however, it must be revised to address the primary problem and intended target (i.e., flowback water from natural gas extraction).

- Publicly Owned Treatment Works such as Philadelphia's are not the problem or intended target, yet the current rule could have drastic and expensive implications for them.

- The rule requires clarification. The current language is vague with regard to the water quality criteria and to what targets they apply (i.e, do they apply to the increased portion of the discharge or the entire effluent)?

- Flowback water disposal presents additional challenges to drinking water providers, such as radioactivity, that are not addressed by the current rule.

HIGH TDS RULE IMPACTS ON PWD's THREE POTWs

Regarding PWD's three POTWs, our fundamental concern with the High TDS Rule, the concern from which the totality of our comments arise, is that the proposed rule is overly broad, as noted above. The High TDS Rule is not intended to regulate the normal day to day operations of POTWs throughout the state. Unfortunately, the overly broad manner in which the High TDS Rule was written could unintentionally do exactly that. If the Rule is not modified, PWD's three POTWs would need to invest billions of dollars in sorely needed capital without the commensurate environmental benefit. The broad language will unintentionally regulate its POTWs, thus triggering the law of unintended consequences.

As we know, the driving force for the High TDS Rule is discussed in the papers virtually every day—the extraction of natural gas from the Marcellus Shale formation. The "fracking" process used to break up the shale and release the natural gas produces high volumes of high concentration TDS wastewater. This wastewater could damage ecological systems and threaten drinking water sources unless carefully managed and regulated.

We wish to note that PWD commends the EQB and DEP for its efforts in seeking to regulate and protect our streams and drinking water. PWD thoroughly supports the purpose and intent of the Rule. As we share these essential common goals, PWD would gladly offer its assistance in helping to ensure that these goals are met.

We do however, have serious concerns with the execution and the language used in the High TDS Rule designed to primarily ensure that Marcellus gas extraction is done in a responsible manner. Rather than target a specific regulation for the extraction of natural gas, the High TDS rule, as currently written, applies a broad brush to all dischargers - municipal and industrial - in all source categories. The application of a rule conceived for a particular application such as gas extraction, but applied to all source categories, inevitably results in a cascade of unintended consequences which have serious implications for those dischargers inadvertently caught up in the regulation.

When the federal Water Pollution Control Act was amended in 1972 to create the act we now refer to as the Clean Water Act, it represented an enormous shift in thinking regarding how we would clean up and protect the nation's waterways. Instead of using broad based water quality goals to achieve improvements, the Act focused on creating specific effluent limits for specific categories of industries. The creation of these industry specific regulations, known as the categorical regulations, transformed the nation's waters.

Category by category—whether it was pharmaceutical manufacturing, steel producing or municipal wastewater treatment, EPA developed the best available pollution control standards for that industry. Since the categorical regulations were clearly targeted, focused, precise and indisputably achievable, they avoided the unintended consequences that are of such concern and moved relatively quickly into law. We see the enormous benefits today.

PWD, therefore, urges the High TDS Rule be rewritten so that it applies solely to the natural gas extraction industrial category--the industry for which it was targeted.

Should it later be found that in some waters high TDS levels are causing concern, and these high TDS levels are unrelated to natural gas extraction, then we should certainly proceed as we would normally proceed under the Clean Water Act. If another high TDS source is identified, categorical effluent limits should then be developed for this new industrial category. In the unlikely event that these additional categorical effluent limitations are insufficient, a Total Maximum Daily Load (TMDL) could be developed apportioning allowable discharge levels of TDS across all point and non point source categories.

In summary, we sincerely believe that unless the High TDS Rule is changed as recommended above, the overly broad drafting of the Rule will result in numerous unintended consequences and problems for PWD's POTWs. A discussion of these issues follows below.

1. The 2,000 mg/l or 100,000 pound per day threshold

Pursuant to Section 95.10(a), the High TDS Rule would apply to discharges that exceed 2,000 mg/l per day or a total TDS loading that exceeds 100,000 lbs per day.

POTWs, while designed to remove suspended solids, do not remove TDS. Hence TDS will be found in all POTW discharges.

The concentration of PWD's TDS discharges is well below the 2,000 mg/l threshold at approximately 400 mg/l. Therefore, from a simple common sense perspective, our POTW discharges would not normally be considered high TDS concentration discharges.

Due to the size of our POTWs and the volume of wastewater we treat each day, our TDS loadings exceed the 100,000 lb threshold. At high volumes even low concentration TDS discharges will exceed the 100,000 lb. per day threshold. It also should be noted that during extreme weather events, as we have experienced this past month, chloride and conductivity levels in our source waters rise significantly as a result of road salting and brining operations. In these cases, public safety outweighs source water quality concerns.

For example, during wet weather events, PWD's three POTWs can process 1.044 billion gallons a day of wastewater. **During such days, our POTWs could achieve the 100,000 lb per day threshold by discharging TDS at a concentration of 11.43 mg/l. This concentration is less than 1 % of the 2,000 mg/l high TDS concentration threshold.**

We believe that the DEP would agree that a discharge concentration as low as 11.43 mg/l should not be considered a high TDS discharge. Yet that is unfortunately how the current law would define such a result.

Therefore, if the rule is not rewritten as a gas extraction categorical rulemaking, PWD urges that all POTWs, or at least the large POTWs, be specifically exempted from the High TDS Rule.

In the alternative, we would ask that either the 100,000 lb. per day threshold be stricken or that any total mass limit be linked with a flow volume number so that the larger your flow the greater the poundage of allowable discharge before the High TDS Rule requirements are triggered. This would be a limit based on both science and practicality.

2. Application to "new discharges"

The threshold requirements of either 2,000 mg/l or 100,000 lbs per day would only apply to "new discharges"—those discharges that did not exist on April 1, 2009. Section 95.10 (a)

Therefore, on its face, it appears that PWD's existing POTWs would not be covered by the High TDS Rule. However, Section 95.10 (a) goes on to define "new discharge" as follows:

> "The term 'new discharge' includes an additional discharge, an expanded discharge or an increased discharge from a facility in existence prior to April 1, 2009."

The problem with this definition, as it relates to POTWs, is that contributions to POTWs are always changing. For instance, old housing gets torn down, new housing gets built. Businesses start up, expand, contract or cease operations all the time. New industries are attracted while some move and relocate. The definition of "new discharge" simply makes no sense when applied to POTWs.

We'd like to offer some current POTW examples. PWD has approximately 465,000 residential accounts. Next month twenty new housing units will be connected to our system and our number of residential accounts will go up to 465,020. Therefore, our POTW discharge has now expanded or increased by twenty homes and our discharge of TDS will have expanded by the amount of TDS normally found in the domestic sewage from twenty homes.

Since our discharge has now increased or expanded, even by this trivial amount in context of our overall discharge, and since we already exceed the 100,000 lb. per day discharge threshold, do our existing POTWs now become "new discharges" subject to the High TDS Rule? If so, to what would the effluent limits proposed later in the Rule apply to? Would the entire discharge of the POTW now be subject to the Rule's effluent limits or would simply the incremental twenty home TDS load be regulated?

Next, let's take the example of a new industry coming into the City of Philadelphia or the surrounding counties which we service. It's a small electroplater that wishes to sell refurbished antiques. Its daily flow is 3,000 gallons per day and it has installed all the necessary pretreatment to comply with federal regulations. The TDS in its effluent is 2,500 mg/l after pretreatment.

Technically, this new electroplater is a high TDS discharge. In relation to the total TDS being discharged currently by our POTWs, the incremental contribution from this new electroplater is so small that it would never be detected at our outfalls. How does the High TDS Rule apply to our POTWs in this scenario? If we accept this new business into our system do all our POTWs now become subject to the Rule?

One last example. We are in the process of updating our Combined Sewer Overflow Long Term Control Plan (CSO LTCP). A critical component of our CSO LTCP is expanding our Northeast POTW to treat an additional 200 million gallons per day during wet weather---flow that would have otherwise gone directly to the river untreated through our permitted CSO discharge outfalls. Since the expanded wet weather flow is so large it will contribute TDS in excess of 100,000 pounds per day.

By implementing our CSO LTCP and expanding our Northeast POTW wet weather treatment capacity, would this expanded facility now be considered a "new discharge" subject to the High TDS Rule even though the exact same amount of TDS was already being discharged via our CSO outfalls? If so, this would result in enormous costs and consequences to our overall CSO LTCP and would require a radical revision and downsizing of our plan. Here is an excellent example of how the current law could severely harm the environment rather than help it.

Therefore, the term "new discharge" must be redefined so that existing POTWs can continue to operate normally and meet the emerging challenges they face without inadvertently being declared a "new discharge" subject to the High TDS Rule.

3. The effluent standards

Pursuant to Section 95.10 (b), new discharges of wastewater with High TDS must comply with the following effluent limits:

500 mg/l of TDS as a monthly average
250 mg/l of total chlorides as a monthly average
250 mg/l of total sulfates as a monthly average

Once again, the fundamental problem with these limits, as with the entire High TDS Rule, is that they were never conceived for POTWs as they exist in the City of Philadelphia. Once again, POTWs as they were designed and built in the 1970s and 1980s to meet the secondary treatment standards found in the Clean Water Act, were not designed to remove TDS. In order to remove TDS below the 500 mg/l threshold we would need to employ advanced treatment technologies such as reverse osmosis costing ratepayers billions of dollars in capital expense, tens of millions in operating expense and with an enormous carbon footprint.

If these unintended consequences remain in place, and the High TDS Rule is not rewritten, billions of rate payer dollars could be spent on a discharge no one ever intended to control for a problem unrelated to POTW activities. Rather than spending these dollars on critical issues facing POTWs such as infrastructure renewal and replacement, reducing CSO discharges, stormwater management, etc. they will be diverted for no real purpose while critical problems remain unfunded and unaddressed.

We will conclude this section of our comments with one last example of how unpredictable an overly broad High TDS Rule can be. If our existing POTWs are found to be regulated by the High TDS Rule we will need to meet the effluent standards found in the Rule. The currently proposed effluent limits for TDS is 500 mg/l and total chlorides in 250 mg/l.

Currently, during dry weather, we are fairly close, but under, the TDS effluent limit at approximately 400 mg/l. Total chlorides are in a relatively safe range during dry weather at approximately 100 mg/l. When it snows, however, as it is massively doing now, salt is added to the roads and sidewalks so people can safely move about the City.

On those days when salt is added our TDS levels increase to approximately 800 mg/l and our chloride levels to approximately 375 mg/l. Just a few snow days per month could increase our monthly average TDS and chloride concentrations in excess of the effluent limits proposed in the High TDS Rule. Permit compliance and the requirement to invest billions in new advanced treatment technology will now be subject to the whims of Mother Nature.

In conclusion, we urge the EQB to reject this rule as written as overly broad. The unintended consequences of the High TDS Rule could be devastating to the ratepayers in

the City of Philadelphia and surrounding communities. We would encourage the EQB to rewrite the Rule so that the protections it offers from possible harm due to natural gas extraction remain in tact without inadvertently impacting the operations of POTWs in Philadelphia and throughout the Commonwealth.

HIGH TDS RULE IMPACT ON PWD's SOURCE WATER

Although we disagree with how the High TDS Rule is currently drafted, PWD does fully support the intent of the Rule to protect ecological systems and sources of drinking water in the Commonwealth from potential harm that might occur due to natural gas extraction from the Marcellus Shale.

Philadelphia withdraws its water from points far down the basin, and activities on over 8,000 square miles of land above these intakes can potentially influence the quality and availability of our drinking water source. The Marcellus Shale natural gas formation underlies roughly half of the watershed area influencing the Philadelphia water supply. It is therefore important for PWD to evaluate and understand the potential impacts of natural gas drilling and high volume fracturing-- and the regulations governing them-- on the waters of the Delaware Basin.

One area of particular concern to PWD is the potential for disposal of high volume fracturing flowback water at facilities upstream of Philadelphia and the possible downstream effects on the quality of our drinking water supply. Our specific concerns are as follows:

Chlorides

Flowback water from high volume fracturing is extremely saline with some chloride levels reaching as high as 40,000 mg/L. Elevated chloride levels from flowback disposal upstream of Philadelphia, along with other influences such as increased development and application of road salts, could exacerbate already increasing chloride concentrations in our raw water supply. Since chlorides cannot be removed using conventional drinking water treatment techniques, increased chlorides in source water may contribute to costly corrosion of drinking water infrastructure and put sensitive customers such as dialysis patients at greater risk of treatment complications. The limits imposed on the fracking process in the High TDS Rule will prevent chloride levels from continually increasing and thus are a positive step toward protecting Philadelphia's source water supply.

Total Dissolved Solids (TDS)

The background information supporting the High TDS Rule draws connections among elevated TDS, bromides and brominated disinfection byproduct (DBP) formation in the Monongahela River. However, it is unclear the extent to which limiting TDS will impact brominated DBP formation for drinking water suppliers in other parts of the state. More information about the specific constituents of TDS (i.e., bromide) in flowback water is necessary to effectively evaluate the impact of the policy on disinfection byproduct formation and overall drinking water quality.

Radioactivity

There are some constituents in flowback water that may pose risks to Philadelphia's drinking water supply that are not addressed by the policy. Samples taken by New York's Department of Environmental Conservation of flowback water contained radium-226 as high as 267 times Safe Drinking Water Act limits. Upstream disposal of wastewater with such high concentrations of radioactivity could impact the ability of downstream water suppliers to meet Safe Drinking Water Act regulations. It is unclear to PWD if samples of flowback water in Pennsylvania have been taken, the extent to which these samples were radioactive or whether concentrations reached those found in New York, or what procedures are in place to approve facilities to accept radioactive wastewater. Access to this information is critical for water suppliers to effectively protect their raw water sources.

Other Constituents

More information overall is needed about flowback water from fracturing in Pennsylvania in order to fully assess the impact of its disposal on drinking water supplies. Like radionuclides, some flowback constituents may impact the ability of downstream water suppliers to meet Safe Drinking Water Act regulations. Other constituents, such as components of fracturing fluid used to facilitate gas extraction, may not be regulated at all and could pose unpredictable consequences to source water, drinking water treatment and drinking water quality. PWD requests a thorough analysis by the state of flowback water disposal and its impact on surface water suppliers. We also request full access to information on chemical constituents in flowback water before any facilities are approved for disposal in the Delaware River Basin.

Additional Questions and Concerns

- Subsection C of the rule requires "no discharge of wastewater from any direct source or site of fracturing, production, etc." How will this be assured? Is this a requirement for closed loop systems at drilling/fracturing sites?

- Costs imposed by the new regulation are estimated to be between .10 and .25 /gallon. How were these figures calculated?

- In the proposed rule, in 95.10, Subsection C (3) and (4), how were the parameters of barium and strontium selected as parameters with limitations from drilling/fracking discharges?

Questions Related to Flowback Water Disposal

- What wastewater facilities (other than DELCORA), in the Delaware Basin are targeted for disposal of flowback water? What is the state's approval process for disposal and how does it account for radioactivity and other pollutants in flowback water?

- Does the proposed policy imply that it is no longer sufficient to dilute plant effluent and that advanced treatment (i.e., reverse osmosis) is required for POTWs accepting drilling/ fracking wastewater?

- What samples of flowback water have been taken from wells in Pennsylvania and what were the constituents? Were radioactive constituents found? If so, what type and at what levels?

- To what extent has the impact of disposal of flowback water been evaluated on drinking water supplies with respect to constituents not already addressed in the proposed rule?

PWD greatly appreciates the efforts by the Pennsylvania Department of Environmental Protection to improve regulations to protect its streams and water supplies in Pennsylvania and we welcome the opportunity to work with DEP in achieving our common goals.

Should you have any questions regarding our comments please feel free to contact David A. Katz, Deputy Water Commissioner, at 215-685-6118 or by email at david.katz@phila.gov.