



Wayne C. Luker, President
Steven N. Kline, Vice President
Michael LeFevre, Manager
Jay W. Blumenthal, Treasurer

1176 Old York Road Abington PA 19001-3713 Telephone: 267-536-1000

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Ms. Lenka Berlin
US EPA Region III, 3WP30
1650 Arch Street
Philadelphia, PA 19103

RE: Draft Total Phosphorus TMDL for the Wissahickon Creek Watershed
Township of Abington Comments

Dear Ms. Berlin:

We are writing to provide comments regarding the Draft Total Phosphorus TMDL for the Wissahickon Creek Watershed, Pennsylvania provided by the US-EPA to the public for review on May 20, 2015. We offer the following comments:

General

The Township of Abington is very concerned that the 40 ug/l endpoint used in the TMDL creates MS4 loadings and WWTP NPDES permit limits that are not achievable using currently available treatment technologies or stormwater management practices.

The data used as a basis for this proposed TMDL was from 2005 and 2006. This data was collected prior to the implementation of TMDL Control measures. Abington Township submitted their Notice of Intent (NOI) to operate their MS4 System under General Permit PAG-13 in September of 2012. This was the permit application that first required the Township to develop a TMDL Control Strategy. This strategy report was accepted by the PADEP and the Township was given a permit (PAG 130012) which went into effect on March 16, 2013, which is well after the data collection for the proposed TMDL. The Township's TMDL plan was never given a chance to affect the anticipated change. The latest NPDES Discharge Permit PA0026867 for the Abington WWTP was also issued after the data collection was done in 2005 and 2006.

On March 5, 2015 PaDEP held a stakeholder meeting at which they presented the results of their in stream investigations. PaDEP also stated that "the Wissahickon Creek's water quality problems are complex. It's not simply a phosphorous loading problem." The creek displays "too much benthic algae growth, poor macroinvertebrate community, altered hydrology-low base flow and flashy floods, altered sediment regime and pollutants in runoff." At this meeting PaDEP proposed an "Alternative Plan" in that all the stakeholders would be required to participate in a program to investigate, plan and implement construction projects that would improve the Index of Biological Integrity (IBI) in the various sections of the Wissahickon Creek and its tributaries in compliance with Federal and State laws.

The Clean Water Act (CWA or Act) Section 303(e), specifies that EPA is not authorized to establish or otherwise take over TMDL implementation plans. EPA is required to review and approve or disapprove each state's CPP, and, once its process has been approved, occasionally review it to ensure that it stays consistent with the Act. EPA's supervisory authority is consistent with the CWA's requirement that EPA "ensure that management plans are developed and



implementation is begun by signatories. Section 303(e) gives the EPA authority to enact its own TMDL implementation plan only where it has determined that the state's effort has not succeeded. EPA may not dictate to a state what measures the state must undertake to reduce pollution from a particular source.

The Clean Water Act provides very specific direction and procedures for the development and issuance of TMDLs. Section 303(d) specifies that states, not EPA, are authorized to issue TMDLs, and that EPA may only develop and publish a federal TMDL where EPA concludes that a state's proposed TMDL action is insufficient to achieve applicable water quality standards.(33 USC § 1313(d)(2); 40 CFR § 130.7). EPA has never provided Pennsylvania with the formal deficiency notices required under Section 303(d), and there has been no allegation that the State ever submitted a deficient nutrient TMDL for Wissahickon Creek. Also, there is no letter from PADEP asking for EPA to complete this TMDL on behalf of PADEP. Since PADEP has proposed and accepted the participation of all the stakeholders in the Wissahickon Creek watershed for the "Alternative Plan", which was also tacitly accepted by EPA representatives at the March 5, 2015 meeting, the "Alternative Plan" is the program that is currently in place and will be pursued in the future to improve the biological integrity of the watershed, thereby, suspending the EPA proposed TMDL.

The TMDL and several primary support documents are summary in nature. These documents rely on data and analyses that are not available for public review as part of those summary documents. The list of "missing" information includes, inter alia:

1. Database used by Tetra Tech to create all of the graphs used to support the TMDL endpoint concentration that controlled the TMDL Total Phosphorous (TP) reductions for all of the permittees (How can we know that the Tetra Tech graphs were properly derived without access to the database?)
2. Documentation that attaining the target instream TP concentration will actually reduce plant growth and restore invertebrate populations (Where else has this happened, how do you know it will work?)
3. Documentation of the plant growth and invertebrate populations in Wissahickon Creek Watershed after full implementation of 2003 TMDLs (EPA claimed data confirmed the last group of TMDLs was inadequate – where is this post-2003 TMDL implementation database?).
4. A modeling report that explains the basis for the input and controlling model parameters used to make various algal and DO related predictions. (How is it possible to know that the model is based on scientifically defensible calibration without knowing the basis for the key components of the model?)
5. Documentation showing how MS4 TP loads from large storm event could possibly cause increased plant growth in the Creek when such loads remain in the system for a fraction of a day (Where is the justification for this assumption by Tetra Tech?)
6. Data from this stream or some other Eastern PA stream showing that meeting a 40 µg/l TP level will control filamentous plant growth as claimed by Tetra Tech. (Why did EPA

use Maryland data from streams with very low TP levels rather than the Eastern PA streams with much higher TP levels?)

7. Documentation showing the fate of TP entering Wissahickon Creek Watershed during non-growing season (The TMDL recommended year round TP control over claims that winter TP loadings settled in the stream bed – where is this analysis?).
8. Documentation showing that MS4 discharges are capable of achieving 80% plus TP reduction (EPA claimed the TMDL demonstrated “reasonable assurance” that the limits are attainable and would be met. Where is this described and documented?)

EPA provided no evidence nor analyses confirming (or denying) that other non-nutrient factors are not the primary factors precluding aquatic life use attainment in the Wissahickon Creek Watershed. The EPA proposed TMDL and expert reports by Tetra Tech completely ignored any and all information that confirmed that this proposed TMDL action is unnecessary and will produce no meaningful change in the ecology of Wissahickon Creek. These omitted records include:

- a) Tetra Tech’s peer reviewed and published papers that confirmed TP reduction will produce no material change in plant growth in this system;
- b) The analyses of the consultant that collected plant growth for this system which concluded that the HIGHEST levels of plant growth were occurring where the lowest TP levels (14-35 µg/l) were occurring in the system;
- c) Repeated Region 3 studies of other PA and VA waters that confirmed plant growth will not be controlled at a 40 µg/l level;
- d) Prior technical agreement of Tetra Tech that using a higher algal growth rate to “manufacture” the appearance that TP control will be effective in controlling plant growth is scientifically unsupportable;
- e) Repeated studies, performed by Tetra Tech at the request of USEPA which confirmed there is no demonstrable relationship between TP levels and any invertebrate index or population measure;
- f) Claiming that MS4 control of loading associated with high stream flows is necessary to restore the invertebrate populations when analyses confirmed such conditions do not even contribute to increased plant growth; and,
- g) Claiming that year round TP reduction is necessary because winter loadings (including dissolved forms of phosphorus) settle in the system when stream sampling data confirmed this simply does not occur and settling of dissolved phosphorus forms is physically impossible.

The regression evaluations presented in Figure 8 (EPT Taxa versus TP), Figure 11 (Urban Intolerant versus TP), and Figure 12 (Clinger % versus TP) result in R² values of 0.0848, 0.1393 and 0.1489, respectively. These R² values are less than the minimum R² that EPA’s Science Advisory Board (SAB) considers acceptable. These low coefficients of determination confirm that there is no reliable predictive

ability for the regression lines shown in these figures, as commented on by the SAB when it reviewed EPA's draft guidance on stressor response methods.

MS4 Comments

- 1) The TMDL states that the Township must reduce 97.8 % of its existing TP load on the Wissahickon Creek which translates into 9,364 pounds of TP. The Township believes that this reduction is unachievable with currently available treatment technologies or stormwater management practices.
- 2) The Township has a currently approved TMDL Strategy Report dated September 14, 2012. In this report, the Township proposed twelve (12) BMPs to meet siltation limits. These BMPs, however also will also remove TP from the stormwater system. It is anticipated that these BMPs will remove 1,213 lbs of TP/year. The Township has also submitted a grant to construct five (5) additional BMPs in the watershed. The anticipated removal of TP from these additional BMPs is 99 lbs/year. Therefore, the total anticipated TP removal from the seventeen (17) proposed BMPs is only 1,312 lbs/year. This is 8,053 lbs/year short of the required reduction. We believe that the proposed reduction limits are unachievable by current technologies.
- 3) The Township has investigated additional BMPs such as stream bank stabilization and restoration. Based upon removal rates found in the Maryland Department of the Environment guidance document entitled *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated (August 2012)*, 0.068 pounds of TP are removed per linear foot of stream bank restored. In order to meet the reduction of an additional 8,053 lbs of TP/year, approximately 118,000 feet of bank would need to be restored. The entire stream bank in the Sandy Run sub-watershed of the Township only amounts to approximately 24,000 feet. If the Township even could "restore" the entire stretch of stream in this watershed, it still would not be able to meet the reduction called for in the proposed TMDL.
- 4) Appendix E of the TMDL should include factors for the concentration of TP for each land use which were relied upon to determine the baseline TP loads and also more clearly describe how the allocated TP loads were determined for the MS4 communities.

WWTP Comments

- 1) The analysis used to evaluate a waterbody's narrative criteria impairment status under Section 303(d) parallels the analysis needed to demonstrate whether a discharger is causing or contributing to an exceedance under 40 C.F.R. § 122.44(d) (e.g., both use current loading and ambient conditions, consider available dilution, project whether a pollutant may "cause or contribute" to an existing or projected impairment). The analysis must be based on current data and pollution control measures, supplemented by relevant studies of the waters in question. The analysis must account for major factors affecting the endpoint of concern, applying a rational cause and effect analysis to demonstrate that nutrient reduction is "necessary" to achieve compliance. The TMDL documents did not provide this analysis.
- 2) The TP limit derived by EPA, however, violated each of these regulatory requirements. EPA failed to comply with 40 C.F.R. § 130.7 by failing to utilize current water quality/plant performance

information in evaluating the need for this TMDL and concluding that the prior TMDLs were insufficient to ensure use protection. The instream data presented on the results of implementing the 2003 TMDL were from 2005 and 2006, prior to the implementation of either the sediment or nutrient/Dissolved Oxygen TMDLs. This TMDL must be demonstrated to be necessary using actual post-2003 TMDL information and confirmation that the sediment TMDL mandates were actually achieved in this watershed. No such information is presented anywhere in this document – EPA just presumes that 2006 was the date by which all TMDL implementation occurred – a presumption that is plainly in error. Consequently, EPA claims that there were insufficient improvements from the enactment of prior TMDL's, however, EPA's assessment was based on information and analyses that were not actually "post TMDL implementation".

- 3) EPA Stressor Response Guidance explains how to use ambient data to make valid cause and effect predictions for nutrients. When evaluating nutrient impacts using stressor-response relationships (as conducted by EPA and Tetra Tech) a key component is confirming that the nutrient level, and not some other "confounding factor" is actually the root cause of the impairment that has been found to exist in the receiving waters. Given (1) the plain causation language of 40 C.F.R. §130.7 and 122.44(d) and the state's narrative criteria, and (2) the lack of such analyses or confounding factors assessment presented by Tetra Tech, rather than unsupported "correlations". Most of the assessments had extremely low statistical power (meaning the relationship was poor to non-existent) yet EPA and Tetra Tech claimed these assessments "demonstrated" TP was the cause of the alleged ongoing system impairment.

- 4) This TMDL, however, provides no information or analyses whatsoever regarding the following key claims made by EPA in the TMDL documents:
 - Excessive plant growth is the cause of macroinvertebrate aquatic life use impairment in this system;
 - TP levels are controlling and causing the excessive plant growth;
 - Stream water quality monitoring data, following implementation of the 2003 TMDL load reductions, confirm that TP is the cause of any ongoing macroinvertebrate aquatic life use impairment in this system;
 - That MS4 or other non-point type contributors of TP can achieve 88-94% reduction levels;
 - Reducing TP to 40 µg/l has been demonstrated to restore, or necessary to restore, invertebrate assemblages in other streams;
 - A sufficient "confounding factors" assessment has been completed which confirmed, to a reasonable scientific certainty, that TP was the primary cause of macroinvertebrate aquatic life use impairment in Wissahickon Creek.

Wissahickon Creek Technical Points:

- 1) EPA published a 2003 TMDL to control algal growth sufficient to meet DO water quality standards, consistent with the state's published narrative criteria implementation procedures. The 2003 TMDL established load restrictions on ammonia-nitrogen, nitrate-nitrite, ortho-phosphorus, and CBOD to ensure attainment with the state's narrative criteria for nutrients (as published and utilized in all Section 303(d) decisions). The 2003 Sediment TMDL controlled excessive sediment contributions from MS4 sources which would also impair invertebrate communities. The 2015 Draft TMDL now claims that "(1) the 2003 TMDLs were not sufficient and (2) ongoing benthic community aquatic life impairments exist due to excessive algal biomass (eutrophic conditions)." (Draft TMDL at 1). For this reason, EPA claims that the stream segments previously addressed in the 2003 nutrient TMDL are still impaired and a new TMDL is required to specifically target excessive plant growth.
- 2) This TMDL addresses the nuisance algal growth by focusing on TP, a nutrient that did not have water quality goal in the 2003 Nutrient TMDL. EPA further asserts that it is justified in taking this action because, when the 2003 TMDL was developed, PADEP indicated that controlling nuisance algae may require additional reductions to instream concentrations of phosphorus (below those contained in the 2003 TMDL), but site-specific data had not yet been collected to determine the levels of TP that would be necessary to control the growth of algae beyond DO considerations. EPA has based the assertion that excessive plant growth still exists, post TMDL implementation, based on data collected prior to 2006, just two years after the 2003 TMDLs were finalized. At the March 5, 2015 stakeholder meeting PADEP reported the November 18, 2015 results from their biologists in stream collecting of macroinvertebrate sampling, determined that the Wissahickon Creek's IBI score was still in the range of 20% to 30%. PADEP stated that "the Wissahickon Creek's scores indicate 1) the stream is impaired, and 2) there is no noticeable improvement after 2009, to coincide with the observed reductions in phosphorous concentration." On the graph provided by PADEP for station WQN 193 (Rt. 73 Fort Wash.) the end of 2008 was delineated as the time when "Phosphorous controls began at STP's" and "Phosphorous loadings in the stream are approximately 30% - 40% of what they were before 2009." These statements further indicate that only reducing total phosphorus concentrations is not resulting in improvements to the IBI.
- 3) The Draft TMDL claims that the wide variations in dissolved oxygen and the subsequent cause of aquatic life impairment in the Wissahickon Creek Watershed is attributed to nuisance algal growth, with excessive nutrient loads directly responsible for such growth. EPA's (Nutrient Criteria Technical Guidance Manual - Rivers and Streams (USEPA, July 2000; hereafter, "Rivers and Streams Document") and PADEP's regulations would require the evaluation of the criteria assessment and then first identify the numeric level of algal growth necessary to cause aquatic life use impairment and then identify the numeric nutrient concentration necessary to prevent such nuisance algal growth. However, fish and macroinvertebrates do not directly respond to nutrients, and therefore may not be as sensitive to changes in nutrient concentrations as algal assemblages. It is recommended that relations between biotic integrity of algal assemblages and nutrients be defined

and then related to biotic integrity of macroinvertebrate and fish assemblages in a stepwise, mechanistic fashion in the Rivers and Streams Document.

- 4) EPA's 2010 Science Advisory Board review of the then proposed stressor –response guidance made the same observation that total phosphorous is not toxic to insect life and its impacts are mediated through excessive plant growth. EPA has not followed this guidance in the TMDL documentation to assess if there is excessive plant growth/poor invertebrate life. In fact, the Draft TMDL does not even illustrate the predicted level of algal growth prior to or following implementation of the TMDL. However, the presentation slides from the June 10, 2015 public meeting at the Temple University Ambler Campus indicate that algal growth was simulated but not used explicitly as allocation targets.
- 5) The major influence on dissolved oxygen (DO) levels is the temperature of the water being sampled. Each day the DO meter utilized at our wastewater treatment plant is calibrated to temperature, barometric pressure and salinity. As discussed in several of the stakeholder meetings, the canopy of trees shading the water within the creeks and the shallowness of the water is a very significant influence on the temperature of the water (which is of great concern to fish species) and the available saturation of DO. The comparison of the Wissahickon Creek to the Cooks Creek (PADEP's March 5, 2015 Alternative Plan presentation graphic) for daily DO fluctuations may only be indicative of the higher rise in temperature in the Wissahickon Creek due to a reduced canopy rather than strictly nutrient concentrations and supposedly higher algal concentrations. This and other stressors were not discussed at all in the draft TMDL, which ignores more immediate and direct stressors on the creek's biological habitat.

Regarding confounding factors in nutrient criteria development, the SAB asserted:

The statistical methods [including non-parametric changepoint analysis] in the Guidance require careful consideration of confounding variables before being used as predictive tools [...] Without such information, nutrient criteria developed using bivariate methods may be highly inaccurate [...] In order to be scientifically defensible, empirical methods must take into consideration the influence of other variables. (2010 SAB Report at 24).

Therefore, all analysis must account for confounding factors produce meaningful results. This is also reiterated by EPA's revised 2010 Stressor-Response Nutrient Criteria Development document. The conditional probability evaluations presented in the 2007 Endpoint Report did not address confounding factors. No other analysis contained in this report addresses a single, well known, non-nutrient factor that can control invertebrate population dynamics (e.g., sedimentation, flows, habitat, canopy, temperature, etc.) Consequently, these lines of evidence are self limiting and cannot be scientifically defensible and are simply speculative.

- 6) The actual results reported in Carrick and Godwin (2006) also references a study conducted by PADEP in 1998 which sampled algae at 10 sites on Wissahickon Creek. (PADEP, 2002; Stressor Verification Study) in which it was concluded that canopy cover, not phosphorus concentration,

was the primary determinant concerning periphyton biomass.

Summary:

This Draft TMDL is predicated on a conceptual model that links excessive nutrients to nuisance algal growth to aquatic life use impairment. The selection of a level of periphyton biomass that is excessive, in accordance with the narrative criterion, must be a threshold biomass above which aquatic life use impairment occurs. This relationship is not shown anywhere in the Stressor Verification document, and without it there is no basis for claiming that any level of periphyton biomass is excessive or that TP is causing aquatic life use impairment. Consequently, this evidence is irrelevant with regard to a determination that TP is the stressor requiring control in this TMDL. Moreover, the only data evaluated to assess this prediction show that TP concentrations as low as 0.039 mg/L have no effect on algal biomass.

In closing, we respectfully request that this TMDL be withdrawn until the stormwater and wastewater discharge limits are given a chance to meet the standards required in the 2003 TMDL. The Township requests that the proposed TMDL be suspended until such time that the implementation of the PADEP Alternative Plan proceeds to the limit of stream restoration technology and fails to improve stream IBI significantly to meet stream attainment goals.

We look forward to your responses to our and all public comments and should you have any further questions relative to the Township of Abington or the Sandy Run Creek sub-watershed, please do not hesitate to contact us.

Sincerely,



Michael LeFevre, Manager
Township of Abington

pc: Governor Tom Wolf
Senator Bob Casey
Senator Patrick Toomey
Congressman Brendon Boyle
PA Senator Arthur L. Haywood, III
State Representative Madeleine Dean
State Representative Todd Stephens
Wayne Luke, President, Board of Commissioners, Township of Abington
Steven Kline, Vice President, Board of Commissioners, Township of Abington
Michael Clarke, Esquire, Rudolph Clarke, LLC, Solicitor, Township of Abington
George Wrigley, Director, Abington Township Wastewater Utilities Department
Michael Powers, Director, Abington Township Engineering Department