



Department of Health

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September 23, 2015

David S. Warne
Assistant Commissioner
NYC Department of Environmental Protection
Bureau of Water Supply
465 Columbus Avenue
Valhalla, NY 10595

Dear Mr. Warne:

NYSDOH and USEPA have reviewed the 2014 Watershed Water Quality Annual Report, a deliverable under Section 5.1 of the Revised 2007 FAD. Our comments are attached. We would appreciate if you could provide a reply to these comments by October 30, 2015.

Please feel free to contact me if you have any questions.

Sincerely,

Pamela L. Young, Ph.D.
Chief, NYC Watershed Section
Bureau of Water Supply Protection

Att.

Cc (electronic):

R. Sokol
T. Boepple-Swider
P. Sweeney – USEPA
K. Kosinski – NYSDEC

DOH/EPA Comments on FAD Deliverables due July 31, 2015

5.1 Watershed Monitoring Program

The 2014 Watershed Water Quality Annual Report (the Report) is a comprehensive summary of the monitoring, modeling, and research conducted by NYCDEP pursuant to its watershed protection program. The Report also describes the scientific studies being conducted in the watershed, both by NYCDEP staff and through other professional research collaborations. The list of peer-reviewed publications included in the Report attests to the quality of this research.

NYC's Catskill-Delaware System continues to supply water that meets all regulatory requirements. The work invested by DEP's staff to help ensure that NYC's water supply continues to meet these requirements is evidenced by the volume and breadth of data and information provided in this report.

NYSDOH/EPA have the following additional comments/questions on this report:

- In the Executive Summary (page xvii), the first sentence of the second paragraph should include “future research” as an endpoint for water quality samples. This data helps to identify the water quality trends and research niches for DEP.
- In Section 1.1.2, NYSDOH/EPA note that two fixed-depth buoys were deployed on Kensico Reservoir in 2014, in addition to four existing sites. Also noted is the deployment of two under-ice buoys at Ashokan Reservoir. We commend DEP for the addition of the Ashokan under ice buoys with expansion to also collect trophic data for DBP modeling efforts, and look forward to a similar deployment in Kensico Reservoir to help better understand under ice turbidity plumes.
- On page 17, in paragraph 2, the text refers to “higher than normal” turbidity in the Schoharie Reservoir. Figure 3.1 shows boxplots for the period 2004 to 2013. However, on page 15, “normal” for reservoir storage is defined as the period 1991 to 2013. What is the period that defines normal in Section 3.1?
- Figure 3.1 on page 18 shows the annual median turbidity in NYC water supply reservoirs. Note that the SWTR filtration avoidance criterion for turbidity (5 NTU) applies to samples collected at the entry point immediately prior to the first point of disinfection.
- On page 18, “large (<1.0 inches) rain events” should be corrected to be “(>1.0 inches)”.
- On page 20, in paragraph 1, the text states that in 2014 there were no exceedances of the Part 703 standard for total coliform during the sampling season. However, Table 3.3 indicates that the standard was exceeded in Croton Falls, Diverting, and

Schoharie Reservoirs. Data presented in Appendix B support the report of exceedances in Diverting and Schoharie Reservoirs, but not Croton Falls. Please clarify this information.

- On page 22, the text in paragraph 2 uses the terms “normal” and “historical”, but it is not clear as to the time period being referenced.
- Section 3.4 provides a discussion of phosphorus-restricted basin assessments. While NYSDOH/EPA agree with DEP’s decision to keep Schoharie and Ashokan reservoirs off the phosphorus restricted basin list, the reasoning for this decision should be better presented in the report. Rather than just attributing the increase in the five-year running average to the extreme weather in 2011, the lack of phytoplankton response to the increased phosphorus should be discussed as well. This could be done through comparisons between Carlson Trophic State Index (TSI) values calculated based on chlorophyll, Secchi depth, and total phosphorus to illustrate that turbidity caused a shift from phosphorus limitation to light limitation. Alternatively, this could be done by discussing the deviations from the OECD relationships (Janus et al. 2014).
- On page 29, the text in paragraph 4 uses the terms “normal” and “historical”, but it is not clear as to the time period being referenced.
- On page 29, in paragraph 5, the report refers to “... the relatively low TP concentrations observed in the Croton System in 2014. Does this include Cross River and Croton Falls?
- In Sections 3.6 through 3.9, NYSDOH/EPA would like to see a more detailed discussion of the elevated chlorophyll levels found in some EOH reservoirs that were attributed to nitrogen rather than phosphorus. This could likely be done using the same tools mentioned in the comment on Section 3.4. The sources of increased nitrogen should also be evaluated and discussed more fully for both reservoirs and stream sites. For example, the benchmark exceedances for the Delaware stream sites were not explained (page 42). An ammonia spike in February and March at Michael’s Brook was attributed to a WWTP located upstream (page 43). Please provide additional detail regarding the suspected source of ammonia and any follow up activities to investigate and mitigate the source.
- On page 33, in paragraph 3, the report states that 3 fecal coliform samples exceeded the benchmark of 20 fecal coliform/100 mL (4% of samples collected) in Ashokan-West Basin. Were these exceedances associated with stormwater and/or snow melt run off events?
- Table 3.9 on page 36 does not list a major inflow stream sample site for Croton Falls Reservoir – is there such a site for Croton Falls Reservoir? Does the WESTBR7 site upstream from Boyd Corners Reservoir also serve as the major inflow stream sample site for West Branch Reservoir?

- Figure 3.7 on page 37 shows the locations of major inflow stream water quality sampling sites and USGS gage stations. The East-of-Hudson area of the map should be enlarged, or provided as a separate figure, as it is difficult to interpret.
- In Section 3.9, stream water quality benchmarks are provided. The chloride annual mean concentration for the West Branch Reservoir Release (WESTBRR) was 23.7 mg/L in 2014. This elevated level is attributed to the predominant operational mode (float) of the reservoir. In 2013, the concentration of 17.7 mg/L was also attributed to the operational mode. Previous annual reports have shown increasing chloride concentrations since at least 2011 (10.5 mg/L). The primary source of chloride to this watershed is reported to be road salt. Has DEP considered efforts to reduce the use of road salt, or the expansion of alternative deicing methods?
- Section 3.9 discusses how operating West Branch Reservoir in predominately float mode has potentially negatively impacted water quality in the reservoir (e.g., increased productivity, lower dissolved oxygen, increased ammonia, as well as the increased chloride concentrations mentioned above). Figure 3.6 on page 35 indicates that 2014 data place West Branch Reservoir into the eutrophic category. Provide a brief discussion of the potential impacts that diminished water quality in West Branch Reservoir may have on DEP's flexibility to use this reservoir in the future.
- Section 3.10 discusses the results of stream biomonitoring in the NYC Watershed. NYSDOH/EPA commend DEP for its use of this tool, in conjunction with other water quality monitoring, to investigate potential sources of stream impairment, as well as to identify areas of improved stream health.
- Table 4.1 on page 57 summarizes the Kensico water quality samples collected in 2014. The last line in the table refers to WWTP sampling. However, there is no discussion of these samples in Chapter 4. Please provide more information on the WWTP sample locations and analytes.
- Table 4.2 on page 69 reports maximum dissolved oxygen concentrations for Kensico's perennial streams. Some of these values seem high for dissolved oxygen concentrations, in particular the record of 103.6 mg/L for N5-1. Please confirm these values.
- Section 4.5.2 provides a good, detailed description of sampling performed by DEP to assess the impact of a storm event on water quality in Kensico Reservoir. The results of this extensive investigation could help DEP identify potential sources of contamination to the reservoir. It is not clear from the report – was this investigation triggered by detection of an unusually high level of coliform or pathogens in the reservoir or just the incidence of an intense rainfall event? Has DEP subsequently learned anything more about the source of the human fecal biomarkers and the seep

area at 38 Greenwood Lane? Does DEP plan to conduct similar investigations following future rain events?

- In Section 5, the discussion on pathogens should include information on matrix spike recoveries at keypoint sampling sites, either in aggregate for the year, broken down into each reporting section, or added to Tables 5.1, 5.2, and 5.9. This quality control information would help provide context for the reported pathogen detections and summary statistics.
- NYSDOH/EPA commend DEP for the in-depth investigation, described in Section 5.4, into the source of elevated *Giardia* levels in the Manorkill, a tributary to Schoharie Reservoir. Systematic selection of sample sites enabled DEP to narrow down the location of the source of *Giardia* cysts, which appears to be a pond and associated wildlife. This information will help DEP evaluate the risk posed by this source and DEP's options for mitigation, if necessary.
- Information presented in Section 5.4 Watershed Streams might be enhanced by including graphic comparisons of pathogen levels detected in watershed streams each year.
- Section 5.6 on page 104 discusses the Hillview Reservoir pathogen sampling. The information presented does not include the additional 20 samples collected between August and December 2014 as DEP investigated low pathogen recoveries in their standard 50-liter samples. This additional work included zero *Cryptosporidium* detections and seven *Giardia* detections.
- In Section 6, NYSDOH/EPA commend DEP for beginning the use of synthetic meteorology time series and "bottom up" approach to evaluate critical climate scenarios that may jeopardize the quantity or quality of water delivered to consumers.
- Section 6.4 describes DEP's participation in the Water Utility Climate Alliance and the Piloting Utility Modeling Applications project with some of the nation's other largest water systems. NYSDOH/EPA commend DEP for its proactive efforts to explore the potential impacts of climate change on the delivery of sufficient quantities of high quality water. These alliances will provide an opportunity for DEP learn from the experience and expertise of others, while sharing the extensive knowledge gained from its own research and modeling efforts.
- On page 115, the last sentence of the last paragraph states: "While there is a difference in the recoveries between the spring and fall samples, there is no significant difference between the overall means for the two methods [Method 1623 and the CC-IFA Method]." Is this referring to a difference in recovery for all samples between the spring and fall, or a difference in recovery between the two methods between the spring and fall? Please provide more information on why recoveries differed seasonally.

- Table 7.2 on page 116 shows spike recoveries in controls and Hillview matrix samples. Briefly describe the Hillview matrix, and why it may have led to slightly lower recoveries (7/10) when the spike dose was 1 oocyst.
- Section 7.4 describes DEP's participation in the 2014 Global Lake Ecological Observation Network meeting, which provided instruction on ways to optimize use of the extensive high resolution data produced by DEP's ROBOMON monitoring buoys. NYSDOH/EPA again commend DEP for continuing to explore new and innovative ways to measure and evaluate the status of its water supply and impacts of its watershed protection programs.