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October 21, 2008 #08-023-PS

U.S. Environmental Protection Agency

Clerk of the Board,

Environmental Appeals Board (MC 1103B)

Ariel Rios Building

1200 Pennsylvania Avenue, N.W.

Washington, DC 20460-0001

Re: Appeal to the Environmental Appeals Board (EAB) regarding Conditions of Permit Issued September 25, 2008

Members of the EAB:

The City of Manchester, New Hampshire received the draft permit dated July 9, 2008. On July 14, 2008 the USEPA released this draft NPDES for public comment. The City of Manchester sent comments on with respect to aluminum, phosphorus, 85% removal requirement, 7Q10 Methodology, and four general comments regarding the draft permit.

The EPA issued a final permit on September 25, 2008 that included a corresponding response to Manchester's draft comments.

Manchester does accept the comments regarding Phosphorus, the 85% removal criteria and the four general comments.

Manchester is appealing the Aluminum limit and 7Q10 Methodology.

There was also a change in the frequency of sludge testing from the draft permit to the final permit. The draft permit, page 11 of 19, item 5c, states, "The pollutants in paragraph 2c shall be monitored at the following frequency – **(3 times per year).** Manchester, and the other party who provided public comment, had no response to this frequency.

In the final permit, page 11 of 20, 5c, states, "The pollutants in paragraph 2c shall be monitored at the following frequency – **bimonthly (6 times per year).** Manchester believes this was an oversight in preparation of the final permit and respectfully requests that this condition be changed to what all parties had reviewed in the draft.

7Q10 Appeal

The NHDES provided the response to Manchester's 7Q10 comment. The NHDES comment was comprehensive and indicates that the 7Q10 value is derived using low flow frequency statistics. The NHDES further states, *"The log-Pearson Type III distribution relates the mean, standard deviation, and skewness of the logarithm of a flow statistic* Y_g*"*.

The EPA, in the fact sheet page 8 of 33, in the draft permit of July 9, 2008 states the following, *"Available dilution of the receiving water is determined using the facilities design flow and the annual 7-day mean low flow at the 10-year recurrence interval (7Q10)."* This is attached as Exhibit 1.

The NHDES, in the 2008, New Hampshire Consolidates Assessment & Listing Methodology (CALM), section 3.1.19 states, *"7Q10 low flow: According to the ENV-Ws 1705.02 of the State's surface water quality regulations (NHDES, 1999), the flow used to calculate permit limits (i.e., NPDES permits for wastewater discharges) for aquatic life criteria and human health criteria for non-carcinogens, shall be the 7Q10 low flow, which is the average seven day low flow that occurs, on the average, once every ten years."* This is attached as Exhibit 2.

Each description is clear in that it uses the 7-day average low flow, over a 10-year period. Nowhere in either description does it indicate the calculation is a derivative of the complicated formula that the NHDES outlines in its response. What Manchester submitted in the draft response as "Attachment B" follows the written criteria to the letter of description. As calculated, this would give Manchester a dilution of 12.11792 rather than the 11.82 dilution produced using the complicated statistical method.

Should the intention be a statistical derivative, then this should be clearly indicated in the language with a reference to the log-Pearson Type III distribution. Manchester defers to the present language, as written in documents by both agencies, to support its case.

Aluminum Appeal

The City of Manchester had provided extensive comments regarding the permit limit for aluminum. Manchester had asked that the 7Q10 dilution factor be applied to the chronic water quality criteria of 87 ug/l.

The NHDES provided a response indicated that the Merrimack River is on the 303(d) list as "impaired" for aluminum. In the response, the NHDES stated, *"This action followed the listing protocol in the CALM, which is a document that underwent public review and participation before being used by DES."* The EPA approved the CALM document on August 30, 2007.

The NHDES further states that, *"Env-Wq 1703.03(a) states, The presence of pollutants in surface water shall not justify further introduction of pollutants from point and or non-point sources."* It also cites 1708.01(a) that, *"No additional loading to surface water shall be allowed and, accordingly, that water quality limits must be imposed on discharges, without benefit of dilution in order to preserve existing uses of that surface water."*

The response further states that due to the fact that the Merrimack River has no assimilative capacity for dilution of excess aluminum in the plants effluent, the limit would remain at the freshwater chronic criteria of 87 ug/l.

The NHDES has taken samples along the river between 1998 and 2007. There were 12 downstream samples and seven upstream samples that were at or above the chronic water quality standard of 87 ug/l.

The NHDES continues the compelling case outlining the average (84 ug/l) and 90th percentile (115 ug/l) loading of aluminum in the Merrimack River that is contributed by the WWTP effluent. The level of background aluminum above Manchester's outfall in the Merrimack River is 94 ug/l with the 90th percentile being 177 ug/l. The NHDES concludes that due to the fact that the background concentration is above the chronic criteria, Manchester's effluent discharge will be based on the freshwater chronic criterion of 87 ug/l.

Manchester undertook an exhaustive review of all relevant documents for the purpose of either accepting the NHDES response, or appealing the response. It is important to make every effort in an appeal as Manchester is currently periodically in violation of the final proposed aluminum effluent discharge of 87 ug/l. The discharge is not provided the benefit of the standard dilution application correction factor that would have given Manchester a limit in excess of 1 mg/l (1,000 ug/l) for aluminum.

What Manchester has researched through discovery presents as compelling a case as provided by the NHDES. Furthermore, EPA sponsored research and the NHDES CALM and 303(d) listing indicate that the 87 ug/l limit is probably not an appropriate limit for Manchester's NPDES permit.

In review of the 1988 EPA Aluminum document, it was noted that the chronic criterion for aluminum toxicity was developed through testing on the brook trout and striped bass. "*In the 7-day test, 174.4 ug/l killed 58% of the exposed striped bass, whereas 87.2 ug/l did not kill any of the exposed organisms.*"[1] This test was conducted at a pH of 6.5 to 6.6. This has been the basis for the aluminum WQS for the past 20 years for many states that have not been able to develop TMDLs or alternative limits.

In May of 2006, a document was released by URS Corporation with funding and support by EPA Region IX.[2] Section ES.3 1 reviews and updates the aluminum criteria from EPA's 1988 Guidance Document for Aluminum. The report expounds upon the findings of the 1988 document by demonstrating how calcium (hardness) decreases the toxic effect on fish. It also illustrates how circumneutral pH ranges, dissolved organic matter, and weak organic acids (e.g., fulvic, citric and humic acids) increase Al solubility while decreasing aquatic organism toxicity.

The URS document is comprehensive and sheds new light on the 1988 EPA study. Page 3-4 and 3-9 (document pages attached as Exhibit 3) reviews the papers as developed by Cleveland and Buckler and demonstrate that current statistical methods would have resulted in a Criteria Chronic Concentration of 122 ug/l based on those findings.

[1] Ambient Water Quality Criteria for Aluminum – 1988, page 6
[2] Evaluation of the EPA Recalculation Procedure in the Arid West Technical Report, by Parametrix, Inc., Albany Oregon, Chadwick Ecological Consultants, Littleton, Colorado and URS Corporation, Albuquerque, New Mexico, May 2006

The URS document collected 120 papers to review and consider during their extensive verification process of the published criteria. The study concluded that a revised chronic value, based on a hardness of 50 ug/l, be used for brook trout. The research and findings recommend a new chronic value is 624 ug/l. This recommendation is included as Exhibit 4.

The NHDES "CALM' document outlines three conditions that are considered naturally occurring in section 3.1.8 of the document (Exhibit 5). These are, low pH caused by naturally occurring organic acids, aluminum exceedances due to naturally occurring low pH and pH values > 8.0 in tidal waters.

CALM is very specific in how to prioritize weight of evidence approaches for aquatic life use support decisions. This is outlined in section 3.1.23 with an accompanying table for factors to consider (Exhibit 6). The highest priority for making aquatic life use assessments is biological data. It is more heavily weighted than physical, chemical, habitat or toxicological data. The URS recalculation paper strongly supports the biological data factor and corresponding limit of 624 ug/l.

Table 0-26 of the CALM document (Exhibit 7) illustrates an error factor of 20 ug/l that should be applied to either total or dissolved metals analysis without clean sampling techniques. This would have increased the chronic limit, as proposed in the final permit from 87 ug/l to 107 ug/l. This 20 ug/l increase, coupled with the 122 ug/l limit that would be set by considering correction of the chronic value of the 1988 study as a

geometric mean of the Cleveland and Buckler findings would yield a permit limit to 142 ug/l. This limit would be higher than the 90th percentile limit of 115 ug/l as reported within the NHDES response when only.

In the Draft 2008 Section 303(d) Surface Water Quality List, the NHDES announces, *"Naturally low pH is the source of elevated Aluminum in the assessment unit listed below. There are no known sources of Aluminum to the water body beyond that caused by naturally low pH which causes Aluminum to be mobilized from soil/rock."*

This same condition holds true for many segments of the Merrimack River, and contributing streams, brooks and rivers, where aluminum has been found in conjunction with low pH impairments (Exhibit 8). The 303(d) listing for Merrimack River that flows through the City (Assessment Unit ID, NHRIV700060803-14-02), indicates that the NHDES has not determined the contributing sources of aluminum, and there is no threat to water quality. The listing also says the TMDL priority is low with a TMDL date of 2019. The table illustrates that aluminum, D.O and pH are the impairments in this segment of the Merrimack. It is safe to say that the same conditions that exist in the exempt locales are the same conditions that exist in this segment.

The information presented above merit a permit change and is consistent with 40CFR 122.44 (i), Exceptions (Exhibit 9). Under 40CFR 122.44 (i)(B)(1), *"Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of*

a less stringent effluent limitation at the time of permit issuance." This information would be the URS document for the recalculation of Aluminum. The information presented in this document could justify a chronic limit of 634 ug/l for Manchester's permit.

The next section, 40CFR 122.44 (i)(B)(2), *"The Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section under 40CFR 122.44 (a)(1)(b),"* could also justify a change in permit limit. This would be the limit of 142 ug/l when considering the current of using the geometric mean of the Cleveland and Buckler findings and also the 20 ug/l credit given for non-clean sampling techniques.

The final section Manchester would point to is 40CFR 122.44 (i)(C). *"A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy."* This would cover the situation of the naturally low pH that causes Aluminum to be mobilized from soil and rock that produces a higher aluminum background concentration above Manchester's outfall.

Manchester's effluent has hardness in the 60+ mg/l range. The receiving water has hardness in the teens (Exhibit 10). With the dilution ration of 12, this would increase the in-stream hardness by 4 to 5 mg/l on a consistent basis, helping to lower the in-stream background aluminum toxicity.

In closing, Manchester would like to reference U.S. Code 1314 (l), "Individual control strategies for toxic pollutants." Paragraph A requires submission of the 303(d) list of waters within the State, which after the application of effluent limitations, cannot reasonably be anticipated to attain or maintain water quality standards. The achievement of the water quality standard regarding aluminum is not possible for the Merrimack River if there were no point or non-point discharges with respect to aluminum. This is evident in the group five and group six listings in the 2008 draft Section 303(d) listing. It may take 50 plus years to control acid rain, and until that is controlled, aluminum will continue to be mobilized from benthic sediments.

The NHDES may want to seriously consider the URS recalculation of aluminum chronic toxicity concentration of 624 ug/l as the revised WQS and begin to take steps to revise the State's WQS concentrations for this and all other pollutants for which there is new and updated research and findings.

Manchester believes that it has made a very compelling case for either of the following:

1. Application of the dilution factor to the 87 ug/l limit, giving Manchester an aluminum limit of 1,020 ug/l or
2. Set a permit of 624 ug/l as outlined in the URS recalculation document,

We look forward to the opportunity to discuss our appeal with you in more detail. Meanwhile, if you have any questions, or require any additional information, please feel free to contact us at your convenience.

Respectfully submitted,

Frederick J. McNeill, P.E.

Chief Engineer

Attachments

Cc Kevin A Sheppard, P.E. – Dept. of Public Works

Ricardo Cantu – EPD

Jon Pearson, P.E. – M & E