ILLINOIS POLLUTION CONTROL BOARD
December 17, 2012

IN THE MATTER OF:	)	
	)	
PETITION OF EMERALD PERFORMANCE	)	AS 13-2
MATERIALS, LLC FOR ADJUSTED	)	(Adjusted Standard – Water)
STANDARD FROM 35 ILL. ADM. CODE	)	
304.122(b)	)	

HEARING OFFICER ORDER

Petitioner and the Illinois Environmental Protection Agency previously agreed that the deadline for the Agency to file its recommendation is extended to January 14, 2013. To assist the Board in its determination, a written response to the following questions should be filed as soon as practicable.

AS 13-2
Emerald Performance Materials LLC

28.1.c.1.

1. Emerald states that the Board's rationale behind adopting the standards that are now codified as 35 Ill. Adm. Code 304.122 were based on the belief that large dischargers were contributing to low dissolved oxygen (DO) levels in the Illinois River. Pet. at 32. Emerald then references a study underlying the rationale that was later refuted by its authors who found that sediment oxygen demand was the primary cause of the DO sags. Pet. at 32.

   Please provide more information on the study or studies alluded to in the petition regarding the sediment oxygen demand as the primary cause of DO sags in the Illinois River.

28.1.c.4.

2. Petition states that "granting of this adjusted standard will not impair any ***beneficial*** use of the receiving stream..." (Pet at 36, emphasis added.)

   a) Please address whether granting the adjusted standard has the potential to impair any designated or existing uses of the receiving stream?

   b) Are any of the portions of the Illinois River affected by Emerald's discharge on IEPA's current 303(d) list as being impaired for ammonia or dissolved oxygen?

35 IAC 104.406(d)

3. Emerald states the range of ammonia-nitrogen in Henry Plant's discharge is 23 – 150 mg/L based on data from January 1, 2007 to January 31, 2012, and refers to Exhibit 10.

Pet. at 16, 19. Further, Emerald states that the total volume of discharge is 800,000 gal/day (380,000 gal/day from PolyOne, 150,000 gal/day from Emerald, and 270,000 gal/day from utility and contact stormwater). Pet. at 13-14. Emerald provides sampling results for the Henry Plant Effluent for Ammonia in mg/L and flow in gallons per minute, but the data does not present ammonia in terms of pounds per day. Pet. Exh. 10. The previous petition indicated the average ammonia in the effluent was estimated at 909 pounds/day. Exh. 1 at 6. The NPDES Permit provides for a daily maximum load limit of 1848.6 pounds per day for Ammonia (as N). Pet. Exh. 2 at 5.

According to the report from Brown and Caldwell, effluent NH_3-N loads have decreased by 48 percent since 2002 due to shut downs, lower production, and improved recovery. Exh. 13 at 2. The 800,000 gal/day total discharge and the 909 pounds/day ammonia are figures used in AS 02-5 before the changes noted by Brown and Caldwell took place. Exh. 1 at 1.

a) Since the changes noted by Brown and Caldwell took place, please indicate if the total volume of wastewater discharged is still 800,000 gal/day or if a new value is appropriate.

b) Please provide the ammonia data in terms of pounds per day and indicate the average.

c) Since Brown and Caldwell indicate changes at the Henry Plant have resulted in a 48 percent decrease in effluent NH_3-H loads, does Emerald still need a daily maximum load limit of 1848.6 pounds/day Ammonia (as N) as currently expressed in its NPDES permit?

104.406(e)

4. Condition 6(a) and (b) of AS 02-5 and Special Conditions 15 and 17 of the NPDES Permit required Noveon to investigate production methods and technologies that generate less ammonia and submit an annual report to IEPA summarizing these investigatory efforts. (Pet. Exh. 1 at 22, Pet. Exh. 2 at 8.) Annual Summary Reports in Pet. Exh. 6 briefly refer to such efforts as follows. Please provide more detail on these investigatory efforts, including the potential amount of ammonia reduction in the effluent.

Pet. Exh. 6:

Key P2 [pollution prevention] projects that the plant is currently working on which have the potential to reduce ammonia generation at the waste treatment system include the following:

2006 (12-18-06)

a. BBTS Dust Collector System

b. Improved acetonitrile column efficiency to meet the Miscellaneous Organic NESHAP's (MON) standard.

2007 (12-24-07)

a. Investigation of a sintered filter media for the BHS filters that would not be prone to tearing and loss of BBTS product to the waste water.

b. Continued efforts to improved acetonitrile column efficiency to meet the Miscellaneous Organic NESHAP's (MON) standard.

c. Investigation of a new process in the Netherlands called the Anammox (anaerobic ammonia oxidation) process. This is a relatively new method of treating high concentrations of ammonia anaerobically. The first commercial process was installed 2002 and was featured in the January 2007 issue of Chemical Engineering. Based on Brown and Caldwell Environmental Consultants, the bacteria cultured in this system would render the process performance unstable.

2009 (12-22-09)

a. Improvements to the Tertiary Butyl Amine column increasing the recovery of TBA resulting in less amine to the sewer.

b. Utilization of carbon dioxide for pH adjustment reducing overall loading on the biotreaters. The use of CO2 reduces the slug feeing of caustic in the system at the primary clarifier adding stability throughout the system.

2010 (1-14-10)

a. Incorporate ammonia reduction as a metric in the employee gain sharing plan.

b. Conduct additional testing to further determine sources of ammonia within the facility.

2008 (5-20-10)

a. Brown and Caldwell conducted training in August with waste water treatment operators to optimize the WWT system.

b. Initiated study on the effects of Carbon Dioxide for ph buffering.

c. Conducted Fed Batch Reactor testing to quantify any bio-inhibitions present in the system.

2011 (12-20-2011)

One source of ammonia to the WWTP is the bottoms stream from the acetonitrile recovery column in the 3114 process. It has been determined that the recovery efficiency of the column is sensitive to absolute pressure at the bottom of the column. A project was defined during the fourth quarter of 2011 to upgrade the instrumentation around the column in order to more effectively control absolute pressure. These upgrades will be implemented in 2012.

12-18-06:

5. The plant participated in the Pollution Prevention Program in 2006 by supporting a P2 intern. Additionally, the plan participated in a joint IEPA-USEPA P2 conference by presenting P2 project that have been conducted and completed at the plant.

12-24-07:

5. The plant participated in the Pollution Prevention Program in 2007 by supporting a P2 intern.

5. Condition 6(b) of AS 02-5 and Special Condition 16 of the NPDES Permit require Emerald test any new technology or economically reasonable production methods or materials which may reduce ammonia concentration in effluent which IEPA requests they do.

Please indicate if IEPA requested any such tests.

104.406(f)

6. The opinion in AS 02-5 stated,

> Throughout the duration of this adjusted standard, the Board encourages Noveon to research and propose means, ***beyond*** the wastewater treatment plant and multi-port diffuser, of providing environmentally beneficial improvements to the Illinois River in Marshall County. The Board has incorporated voluntary environmental projects proposed by petitioners into adjusted standards in the past. Petition of Illinois American Water Company's (IAWC) Alton Public Water Supply Replacement Facility Discharge to the Mississippi River for an Adjusted Standard from 35 Ill. Adm. Code 302.203, 304.106, and 304.124, AS 99-6 (Sept. 7, 2000) (petition for an adjusted standard for offensive discharges and conditions, and discharges of total suspended solids and iron); Petition of City of East Moline and IEPA for an Adjusted Standard from 35 Ill. Adm. Code 304, AS 91-9 (May 19, 1994); Petition of City of Rock Island for an Adjusted Standard from 35 Ill. Adm. Code 304, AS 91-13 (Oct. 19, 1995). In IAWC's adjusted standard, IAWC was allowed to discharge directly into the Mississippi in exchange for IAWC's financial support of nearby non-point source sediment loading reduction projects. The projects were implemented by a charitable non-profit trust, the Great Rivers Land Trust, whose goal it is to protect the watersheds in the area.
>
> Any project that Noveon researches and proposes must improve, restore or protect the Illinois River in Marshall County and reduce risks to public health and the environment beyond what is ordered by this adjusted standard. While research of potential improvements is not part of the Board's order, the Board will consider proposals by Noveon

should Noveon choose to renew this adjusted standard at a future date. AS 02-5, slip op. at 19 (November 4, 2004), emphasis added.

a) Since Emerald has chosen to request renewal of AS 02-5, please provide information on projects that Emerald has identified or plans to research and propose as set forth above in the Board's opinion in AS 02-5.

b) Indicate whether Emerald is working with IEPA g in the research and selection of potential projects.

c) Please include information on capital and annual costs as well as duration for the potential project(s) to form a comparison with costs for full or partial compliance with the ammonia effluent standards.

104.406(g)

7. The opinion in AS 02-5 states, "[S]ince the Board's finding concerning the impact on aquatic life is partly premised on Noveon's compliance with the ammonia nitrogen water quality standards, the Board orders Noveon to demonstrate compliance with the applicable ammonia nitrogen water quality standards at the edge of the mixing zone and ZID, as will be defined by the Agency." Pet. Exh. 1 at 18-19, AS 02-5, slip op. at 18-19 (November 4, 2004).

Emerald states that the water quality standards for ammonia (acute and chronic, summer and winter) will be met at the edge of an appropriately calculated zone of initial dilution (ZID) and mixing zone. Pet. at 34. The June 20, 2006 letter from AquAeTer indicates that at the edge of the ZID and the edge of the mixing zone, the dispersion is 47.9:1 and 299.9:1, respectively. Pet. Exh. 5 at 1. The "Diffuser Performance Evaluation" indicates these values correspond to 92 feet and 1090 feet from the diffuser, respectively. Pet. Exh. 4. Table 3-8 at page 3-14. However, in the body of the petition, Emerald states the edge of the ZID is twenty feet downstream of the diffuser. Pet. at 10.

a) Please provide more information, including the dimensions, of the ZID and mixing zone approved by IEPA.

b) Please indicate the dispersion at the edge of the ZID and mixing zone.

c) Please indicate how Emerald demonstrates with quarterly monitoring that compliance with the applicable ammonia nitrogen water quality standards has been met at the edge of the ZID and mixing zone.

8. Pet. Exh. 12 (May 10, 2012 letter from AquAeTer) states, "Utilizing the new projected ammonia limit with the analysis on the entire background dataset, the dispersion required to meet the acute standard is 11.5:1 and to meet the chronic standard is 68.1:1." Pet. Exh. 12 at 2. These values don't seem to coincide with the table in the same letter, Table 1: Comparison of Analysis. Pet. Exh. 12, Table 1.

a) Please indicate the basis of the values of 11.5:1 and 68.1:1.

b) Please indicate whether these values represent dispersion required to meet both the summer and winter standards.

c) Of the 50 and 75 percentile statistics used in Table 1, please indicate which was used for this determination. Please comment on the appropriateness of using the 50 or 75 percentile for a compliance determination.

9. The opinion in AS 02-5 stated, "[T]he Board shares the Agency's concern that Noveon has not provided any in-stream monitoring studies to assess the actual impact of its discharge on aquatic life. Ag. Memo at 26." AS 02-5, slip op. at 18 (November 4, 2004).

Special Condition 14 of the NPDES Permit required the permittee to conduct biomonitoring of the effluent by running acute toxicity tests on at least two tropic levels of aquatic species representative of the aquatic community in the Illinois River (i.e. fish and invertebrate). If the results of the biomonitoring identify toxicity, the NPDES permit states, "IEPA may require that the Permittee prepare a plan for toxicity reduction evaluation and identification." Pet. Exh. 2 at 7.

Pet. Exh. 5 describes the procedure for the toxicity testing, but the petition does not appear to contain the results of the testing. Emerald states, "...Emerald has conducted effluent toxicity testing and submitted the results to the Agency quarterly as required by their NPDES Permit." Pet. at 10.

a) Please provide information concerning the results of the toxicity testing.

b) Please indicate if IEPA has required the Permittee to prepare a plan for toxicity reduction evaluation and identification.

10. Emerald states that the mixing zone study showed that the multi-point diffuser achieved a dispersion ratio of 39.8:1 at the edge of the ZID twenty feet downstream of the diffuser, yielding a LC_{50} of 2.51% by volume. Pet. at 10. Emerald stated, "Because all the acute toxicity testing results to date have been the [sic] above this value, Emerald is meeting their toxicity limit for LC_{50} of greater than or equal to 2.51 percent by volume." Pet. at 10.

Please more fully explain the basis for stating that the toxicity limit for LC_{50} is greater than or equal to 2.51 percent by volume.

104.406(k)

11. The petition at 7 refers to Exh. 4 entitled "Diffuser Performance Evaluation" dated December 2005. Exh. 4 only included Appendix 1 of 4 from the Diffuser Performance Evaluation. Please provide a copy of the remaining appendices: Appendix 2--Joint Application Form and Acceptance Correspondence, Appendix 3--Fluorometer Calibration Curves, and Appendix 4--Field Notes and Data.

IT IS SO ORDERED.

Carol Webb

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Hearing Officer
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CERTIFICATE OF SERVICE

It is hereby certified that true copies of the foregoing order were mailed, first class, on December 17, 2012, to each of the persons on the attached service list.

It is hereby certified that a true copy of the foregoing order was hand delivered to the following on December 17, 2012:

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