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DEPT. OF NATURAL RESOURCES

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June 29, 2007

Dr. Virginia Dale
USEPA Science Advisory Board (mailcode: 1400F)
Hypoxia Advisory Panel
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: Comments on the draft report on the Hypoxia Advisory Panel

Dear Dr. Dale:

The Wisconsin Department of Natural Resources is a member of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force and we participated in your meeting June 13-15, 2007 in New Orleans. We would like to thank the Science Advisory Board (SAB) for completing this report and for proposing a specific timeline for completion of this document. Wisconsin recognizes that the Gulf Hypoxia issue is a national issue and we are interested in cooperating to minimize our nutrient contribution to this problem. Our comments are organized as follows; high cost of treatment to achieve the nutrient reduction goals, non-point source implementation issues and results from studies done by the Madison Metropolitan Sewerage District (MMSD) (see Attachment).

High Cost of Treatment

We understand that the SAB's main objective was to review the available published science that relates to all the nutrients in the Mississippi River watershed. Issues concerning costs was not the charge of the SAB, but is a major factor in implementing the recommendations of the SAB report. In this regard, we are very concerned with the inordinately high cost and relatively low benefit associated with achieving the proposed effluent discharge limits for municipal and industrial point sources. To achieve a Total Phosphorus (TP) limit of 0.3 mg/L and a Total Nitrogen (TN) concentration of 3.0 mg/L, we estimate the capital cost for Wisconsin alone to be approximately $4 Billion, and the State of Wisconsin is one of the smaller contributors to the total loadings in the watershed.

A recent pilot plant study was conducted at the Madison Metropolitan Sewerage District (MMSD) which is our largest discharger in the MARB. MMSD operates a 42 MGD advanced wastewater treatment facility that is currently using a biological nutrient removal (BNR) system averaging less than 0.5 mg/L TP and, as a side benefit, achieving approximately a 50% reduction of TN. They found that chemical addition and effluent filtration would be required to consistently meet a lower effluent limit for TP. They have found that addition of methanol would be required to further reduce their total TN concentrations, currently ranging from the mid-teens to single digit levels. We suggest that the report include information and data developed by MMSD in the analysis of recommendations to address hypoxia. We can provide additional information on this study if the SAB would like more specifics.

The costs and practical application problems to achieve similar reductions in TP and TN at our smaller facilities would be significant. We do have 23 smaller groundwater discharge facilities in the state that are designed to meet an effluent limit of 10 mg/L TN and they struggle to meet this during the winter months. Our facilities can currently meet 1.0 mg/L TP, and as such, we feel that any significant additional load reductions in TP will have to be achieved through additional chemical addition followed by effluent filtration. It is important to understand that there is no funding available for this type of construction at wastewater treatment plants in our state. While the report suggests that these limits can be achieved with minimal investment, our calculations indicate that significant expenditures will be needed to attain the level of treatment to these levels. Since the 0.3 mg/L TP will require chemical addition and filtration, a substantial investment in infrastructure would be necessary.

Non Point Source Implementation Issues

The report recommends that tiled lands of Iowa, Illinois, Indiana, and Ohio be the focus for meeting the reduction goals. Wisconsin has tiled land in the basin, but we do not know the exact acreage. We agree with the desire to control nitrates and phosphorus, along with sediment, from areas of Wisconsin draining to the Mississippi River. Portions of the Rock River basin, with ditch and tile drainage, could be a priority area for Wisconsin. However, to achieve the nitrogen reduction needed to address the Gulf hypoxia conditions, a very substantial amount of federal funding for financial and technical assistance is needed. Presently, with the advent and rapid expansion associated with corn-based ethanol, we do not see the option of reducing nitrogen fertilizer as particularly viable.

Therefore, we are left with two primary options. One is the creation of wetland treatment systems at the discharge locations of ditches and tile lines. The financial costs for such systems far outstrip the dollars available through section 319 Clean Water Act grants. Also, funding for the creation of these wetland treatment systems is not eligible under the Wetland Reserve Program. The only viable source of funding is the Environmental Quality Incentives Program, but that program lacks the capability to compensate for the loss of the land. The other option seems to be to move to and, at the appropriate time aggressively promote, perennial-based cellulosic ethanol requiring minimal or no additional fertilizer. Financial incentives and technical assistance will be needed to encourage producers to change crops and cover losses for two to three years while the perennials are established. This option would require that biofuel facilities be re-designed and modified to accommodate cellulose. Transportation systems for crops and bulk cellulose materials must also be developed.

The value of this SAB report would be significantly enhanced if it included information on how the state percentage reductions in TP and TN can be attained, and the implications of such management actions. For example, if discharges from tile field drainage systems are to undergo treatment in order to get nutrient reductions, how would this be done? The USEPA should provide to you the section 319 databases that contain successful practices to reduce nutrient loadings.

In Wisconsin we have 70% cost share to farmers when we require that they implement nonpoint source reductions. We have estimated that the Wisconsin cost for implementing the non-point source reductions the SAB report recommends to farms would be between $90-150 Million.

The SAB report focuses on the basins upstream of the lower Mississippi River basin and we would like to see the same depth of analysis on the lower Mississippi. We would also like to see more qualification for the proposed percentage reductions that you state in the report. Do they apply to individual farms, to the state as a whole, to the watershed or to some other location?

To summarize, our major comments are on the costs related to get to the small point source recommended discharge levels. Recognizing our past efforts in the State of Wisconsin to control phosphorus, if our major cities are currently meeting 0.3 mg/L TP with existing technology, then there will be no further phosphorus reductions from our state. Capital cost and Operations & Maintenance costs to get these effluents below 0.3 mg/L for an effluent limit would mean they would have to add additional treatment steps at significant cost.

Again, we request that MMSD studies and treatment data be included in the scientific analysis to reflect the cost and implement ability of options to address Gulf Hypoxia.

Thank you for the opportunity to comment on your report.

Sincerely,

Russell A. Rasmussen, Director
Bureau of Watershed Management

cc: Susan Sylvester
Chuck Burney

Attachment to SAB comments

Information from 77th Annual Report to the Commissioner of the Madison Metropolitan Sewerage District for the Calendar Year 2006

MMSD study—Nitrogen

Results from the Madison pilot plants in 2004 and early 2005 showed that effluent nitrate concentrations could be treated below the current level of 16 mg/L discharged from the full scale plant down to 9 or 10 mg/L without chemical addition, but it would be impossible to produce an effluent with less than 3 mg/L of TN without methanol addition. The 2006 pilot plant design, used varying mixed liquor recycle flow rates and an anoxic zone preceded by varying methanol additions in order to further remove nitrates. Results of operation in 2006 indicated the pilot plant might meet the goal of 3 mg/L TN in the effluent at the higher methanol doses, and the mixed liquor recycle rate did not have as much of an effect on effluent nitrogen concentrations as the methanol dose. Simply increasing the recycle rate would not significantly help in meeting the goal of 3 mg/L TN. The pilot plant operations were often hampered by foaming and inconsistent ammonia removal, making it difficult precisely to quantify the potential for meeting the TN limits. Regardless, operation and maintenance of facilities would be more complex and could be subject to more frequent biological upsets.

MMSD Study—Phosphorus

The current WPDES effluent limit for this facility using biological treatment is 1.5 mg/L TP and the current discharge averages approximately 0.35 mg/L. In the future, possible standards for discharges to a lake or impoundment could be as low as 0.05 mg/L total dissolved phosphorus and 0.01 mg/L total dissolved phosphorus in the summer months. Achieving these standards would require chemical precipitation and filtration in addition to biological phosphorus removal. Varying doses of alum were added along with methanol to the activated sludge pilot plant. It was determined that filtration would significantly lower the effluent TP concentration for all alum dosages. However, it was difficult to determine the influence of low versus high alum dosages coupled with filtration on the effluent TP, although at higher alum doses, lower effluent TP concentrations could be attained. Reliably attaining an effluent concentration of 0.05 mg/L TP may be possible, but reliably attaining an effluent concentration of 0.01 mg/L TP will be difficult, if not impossible.

* It should be noted that the TP effluent limit for the vast majority of facilities in Wisconsin is 1.0 mg/L TP.

** The link to the MMSD report is:
http://www.madsewer.org/Publications/Reports/AnnualReport.pdf