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U.S. Environmental Protection Agency

Climate Change Division, Office of Atmospheric Programs

Office of Air and Radiation

1200 Pennsylvania Ave, NW

Washington, DC 20460

Via Email: Hockstad.Leif@epa.gov

**Re: NACWA Comments on Wastewater Treatment Emissions Estimates in
EPA's Draft *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009***

Dear Mr. Hockstad:

The National Association of Clean Water Agencies (NACWA) appreciates the opportunity to comment on the U.S. Environmental Protection Agency's (EPA) draft *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009 (Inventory)*. NACWA represents the interests of nearly 300 publicly owned treatment works (POTWs) nationwide, serving the majority of the sewered population in the U.S. NACWA's members are acutely aware of EPA's new Clean Air Act (CAA) regulations on greenhouse gas (GHG) emissions and are seeking to ensure that emissions from wastewater treatment facilities be characterized correctly throughout all of the Agency's GHG programs.

NACWA's comments on the *Inventory* are specific to Section 8.2, *Wastewater Treatment*. The wastewater treatment category of the *Inventory* consistently ranks in the top ten categories for nitrous oxide and methane emissions in the U.S., although the emissions are much smaller in magnitude than for the highest ranked categories. The wastewater category is broad, including POTWs, septic systems, and industrial wastewater treatment systems. Our review focused on the portion of the wastewater treatment emissions from POTWs, which are a fraction of the total wastewater treatment emissions.

NACWA submitted comments on previous *Inventories*, and we appreciate EPA's response to these comments and the Agency's willingness to work with NACWA to refine the GHG emissions estimates for POTWs. Some adjustments have been made in past years to the methods used to calculate GHG emissions from POTWs, and NACWA has supported these changes. In the 2009 *Draft Inventory*, the addition of Table 8-9 to show the contributions of septic and centralized systems to the domestic wastewater methane emissions was appreciated by NACWA. The corrections to the equations used to calculate nitrous oxide emissions are also helpful.

The *Inventory* is intended for informational purposes only, not for regulation. However, in EPA's 2009 proposed *Prevention of Significant Deterioration and Title V GHG Tailoring Rule* ("Proposed Tailoring Rule"), the methods for calculating GHG emissions in the *Inventory* were cited as the methods that a facility must use to calculate whether the threshold for regulation of GHG emissions under the CAA is exceeded. While this reliance on the *Inventory* was removed from the final version of the Tailoring Rule, the *Inventory* has been referred to by EPA staff as one method for determining emissions under the Tailoring Rule. As NACWA pointed out in its comments to EPA on the Proposed Tailoring Rule, the *Inventory* is meant to provide a nationwide estimate of emissions from broad categories of facilities, not emissions from individual facilities, and therefore the *Inventory* calculation methods may not be the best tool for regulatory compliance. The Office of Air and Radiation should ensure that all of its offices understand the purpose of the *Inventory*. If EPA does plan to use the *Inventory* to determine regulatory compliance, then it is especially important that the *Inventory* calculation methods accurately reflect actual emissions from facilities.

As explained in our previous comments, NACWA believes that the *Inventory* emission calculation methods for nitrous oxide could still be improved to more accurately reflect actual emissions from POTWs. The *Draft Inventory* calculates nitrous oxide emissions using estimated nitrogen loadings to wastewater that are based on reported annual protein consumption, which is the method used in the Intergovernmental Panel on Climate Change (IPCC) protocol document¹ (*IPCC Guidelines*). NACWA believes these loading rates are too high, and that EPA needs to conduct more research to determine more accurate loading rates to use in the *Inventory*. As NACWA has pointed out in its previous comments on the *Inventory*, the rates currently used in the *Inventory* are higher than rates presented in standard wastewater engineering references such as Metcalf & Eddy². Metcalf & Eddy reports a per capita nitrogen loading rate to wastewater of 15 g N/capita-day, a value usually considered the "industry standard" by POTWs. This value is supported by a wealth of data and has been widely confirmed in U.S. practice. The type of data used in Metcalf & Eddy represents all domestic sources of nitrogen, including meal production and consumption, the use of other nitrogen-containing compounds, and both residential and commercial sources.

NACWA conducted a survey of measured total nitrogen loading rates for 48 wastewater treatment facilities throughout the U.S., with a total service population of over 17 million people. The results of this survey were summarized in NACWA's comments on the 2007 and 2008 *Draft Inventories*, with the average nitrogen loading rate of 15.1 g N/capita-day verifying the Metcalf & Eddy value. Since these data were from measurements of nitrogen loading to POTWs, the nitrogen loading rate includes all sources (residential, commercial, and industrial) for the service communities represented.

EPA states in the *Draft Inventory* that "the dataset previously provided by NACWA was reviewed to determine if it was representative of the larger population of centralized treatment plants for potential inclusion into the inventory." However, EPA concluded that "this limited dataset did not represent the number of systems by state and the service populations served in the United States." NACWA disagrees with this conclusion. The survey of measured nitrogen loading rates at POTWs illustrates that the Metcalf & Eddy loading rate is representative of U.S. POTWs, as are other published loading rates cited in NACWA's previous comments.

¹ IPCC, *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Prepared by the National 18 Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T., and Tanabe K. (eds.) 19 Published: IGES, Japan, 2006.

² Tchobanoglous, G., F.L. Burton, and H.D. Stensel, *Wastewater Engineering: Treatment and Reuse*, Metcalf & Eddy, Inc. 4th Edition, McGraw-Hill, New York, 2003.

NACWA recommends that EPA conduct its own study of nitrogen loading rates to centralized treatment plants. EPA should have enough data available through its National Pollution Discharge Elimination System (NPDES) permitting program to determine an appropriate and justifiable nitrogen loading rate. The NPDES permitting program is nationwide in scope and long-term in nature, which would allow changes to be made in emissions estimates over the time series represented in the *Inventory*. Since EPA believes that further data of a broader and more representative scope are required before changing the *Inventory*, the NPDES database would certainly suffice as it represents every POTW in the U.S.

NACWA believes that using the literature nitrogen loading values or EPA-collected values from U.S. POTWs would better reflect the actual emissions from POTWs than the current methods based on the *IPCC Guidelines*, which do not necessarily reflect actual conditions at POTWs throughout the nation. This is illustrated by the emission factor ("EF₁") of 3.2 g N₂O/person-year for plants with no intentional denitrification, which is used in the *Inventory* and *IPCC Guidelines* to calculate nitrous oxide emissions from centralized wastewater treatment plants. This value was obtained from a single study of a very small wastewater treatment plant (1.06 million gallons per day, or MGD) in a small university town in New Hampshire. The population of this town is 12,500 during the school year, but drops to 6,200 in the summer months, during which most of the measurements for this study were made. If the IPCC can use this single study to define an emission factor that is used for centralized treatment facilities all over the world, certainly EPA can justify changing the nitrogen loading rate for facilities in the U.S. based on literature values and data that it can collect from POTWs across the nation.

In addition to reconsidering the nitrogen loading rates, NACWA recommends that EPA make two specific changes to the equations on page 8-15 used to calculate nitrous oxide emissions:

1. In the N₂O_{EFFLUENT} equation (line 45, page 8-13), the US_{POP} factor should be multiplied by the WWTP factor, as it is in the N₂O_{WOUT NIT/DENIT} equation, since septic system users should not be included in the amount of effluent discharged to aquatic environments. NACWA recommends that any nitrous oxide contributions from septic systems be calculated in a separate equation if they are to be included in the *Inventory*.
2. The value of 271 Tg N for N_{SLUDGE} (line 46, page 8-15) appears to be an error, resulting in a negative value for N₂O_{EFFLUENT}. The value of 144 Gg N found in the *Draft Inventory Annex* in Table A-206 (page A-254) is a more appropriate magnitude. However, even substituting this 144 Gg N value for N_{SLUDGE} does not result in a N_{TOTAL} value that agrees with the value of 16.2 Gg N₂O in Table 8-7. EPA must review the equation for N₂O_{EFFLUENT} and all of the values used in it for accuracy.

Thank you for consideration of our comments on the *Draft Inventory*. Please contact me at 202/296-9836 or cfinley@nacwa.org if you have any questions about NACWA's comments.

Sincerely,



Cynthia A. Finley
Director, Regulatory Affairs