

## Errata to:

## Life Cycle and Cost Assessments of Nutrient Removal Technologies in Wastewater Treatment Plants

Prepared for:

U.S. Environmental Protection Agency

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## **ERRATA**

ERG identified an error in Appendix F of the Life Cycle and Cost Assessments of Nutrient Removal Technologies in Wastewater Treatment Plants (EPA 832-R-21-006), dated August 2021. Equation F-3, the equation used to calculate nitrous oxide (N2O) emissions from wastewater treatment processes, included an incorrect molecular weight conversion factor of N to N2O of 44/14. The correct conversation factor is 44/28.

This error only affects N2O emission from biological treatment. The corrected emissions are half as much as those presented in the report, as shown in Table 1 below. Emissions of N2O only affect the global warming potential (GWP) impact category but are reflected in all related charts and discussion (Figures 6-5, 8-1 and 9-3 and Tables 8-1 and 8-3). Figure 1 compares the GWP impact of treatment systems before and after correction of the N2O conversion factor (Figure 6-5 in the report).

Table 1. Comparison of N<sub>2</sub>O Emissions from Biological Treatment

System Configuration Level	N <sub>2</sub> O Emitted by Process (kg N <sub>2</sub> O/yr)	
	Original Estimate <sup>a</sup>	<b>Corrected Estimate</b>
1	6.6E+02	3.3E+02
2-1	2.9E+03	1.5E+03
2-2	3.9E+02	1.9E+02
3-1	7.8E+03	3.9E+03
3-2	3.0E+03	1.5E+03
4-1	8.2E+03	4.1E+03
4-2	7.7E+03	3.9E+03
5-1	7.8E+03	3.9E+03
5-2	7.7E+03	3.9E+03

a – Estimates included in Table F-2 of *Life Cycle and Cost Assessments of Nutrient Removal Technologies in Wastewater Treatment Plants* (EPA 832-R-21-006.

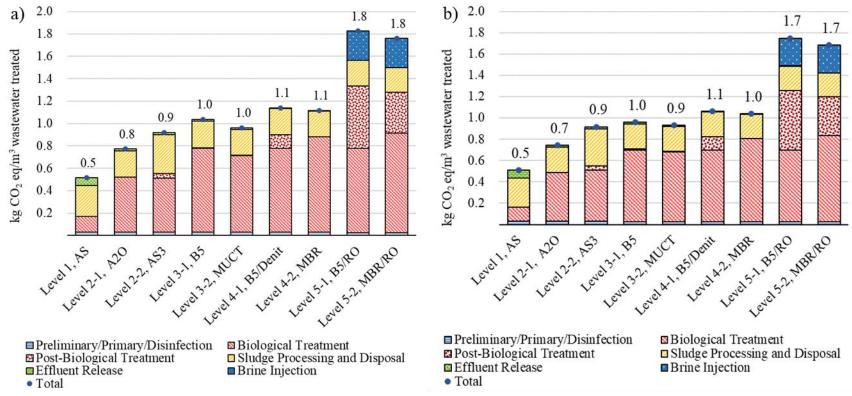


Figure 1. Comparison of Global Warming Potential Impact prior to (panel a) and following (panel b) correction of the N<sub>2</sub>O conversion factor.

Because the error affected the calculation of biological treatment emissions, which are included for all systems, it has a limited effect on the comparative results between systems. Correction of the error alters the height of the biological treatment bars of each system. Prior to correction of the error, N2O emissions from biological treatment contributed between 0.8% and 15% of total GWP emissions.

- The largest contribution of N<sub>2</sub>O to GWP is observed for treatment levels 3-1, 4-1, and 4-2 (14-15%). Using the updated conversion factor the contribution of N<sub>2</sub>O to GWP drops to between 7 and 8%.
- More moderate contributions are observed for treatment levels 2-1, 3-2, 5-1 and 5-2 (6-8%). Using the updated conversion factor the contribution of  $N_2O$  to GWP drops to between 3 and 4%.
- The smallest contribution of N<sub>2</sub>O to GWP is observed for treatment levels 1 and 2-2 (0.8-3%). Using the updated conversion factor the contribution of N<sub>2</sub>O to GWP drops to between 0.4 and 1.3%.