

Amendment of the Total Maximum Daily Load (TMDL) for Ammonia in Onondaga Lake

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An ammonia total maximum daily load (TMDL) was established by the New York State Department of Environmental Conservation (NYSDEC) for Onondaga Lake in March 1998. The addition of tertiary treatment for ammonia at the Metropolitan Syracuse Sewage Treatment Plant (Metro) has significantly reduced the amount of ammonia discharged to the Lake. As a result of the reduced loading the Lake currently meets the State's water quality standard for ammonia and was delisted from the 303(d) list in 2008.

Remediation activities continue to address contaminated sites at several locations in the Onondaga Lake watershed. The Willis Avenue Groundwater Treatment Plant (GWTP) provides water treatment for several Honeywell remediation sites including groundwater from hydraulic control systems along the Onondaga Lake shoreline. These hydraulic control systems prevent contaminated groundwater from reaching Onondaga Lake. During typical operations wastewater from the GWTP is sent to Metro for additional treatment. During wet weather periods discharge to Metro is temporarily suspended and the GWTP discharges directly to Onondaga Lake. This discharge does not represent a new source of ammonia to the Lake but rather existing sources that previously reached the lake through surface runoff to tributaries or through the groundwater.

This amendment to the existing ammonia TMDL for Onondaga Lake incorporates the discharge from the GWTP into the existing TMDL framework. The amendment will ensure that the TMDL for ammonia in Onondaga Lake is not exceeded and that the Lake continues to meet the ammonia water quality standards.

Existing 1998 ammonia TMDL

A TMDL of 2,170 lb/day of ammonia as NH_3 was identified as the limit which would allow the Lake to meet the ammonia water quality standards. Allocations appear in Table 1.

Only one point source was identified in the 1998 TMDL. Therefore, the entire waste load allocation (WLA) was allocated to Metro, and this allocation was expressed as seasonal effluent concentration limits. Those effluent limits remain in place today as part of Metro's State Pollutant Discharge Elimination System (SPDES) permit.

A load allocation (LA) of 612 lb/day of ammonia as NH_3 was determined from the non-point source ammonia load estimated by the model for the 1987 calendar year. As a dry year 1987 was

Table 1: Allocations in the 1998 ammonia TMDL. Note rounding errors may affect the total.

Source	Ammonia (lb/day as NH_3)
Waste Load Allocation (WLA) Metro NY0027081	1,340
Load Allocation (LA)	612
Margin of Safety (MOS)	217
Total Maximum Daily Load	2,170

identified as representative of the critical conditions for ammonia discharge to the Lake. Ammonia loadings from the tributaries ranged from almost 400 lb/day as NH₃ to nearly 1,400 lbs/day as NH₃ during the 1986-1995 period. Tributary loads were determined from available data for Ley Creek, Onondaga Creek, Ninemile Creek, Harbor Brook, East Flume, and Tributary 5a.

A 10% (217 lb/day of ammonia as NH₃) margin of safety (MOS) was included in the 1998 TMDL.

Current Conditions

The implementation of tertiary treatment for ammonia at Metro in 2005 has significantly reduced loads to Onondaga Lake (Figure 1). The load to the Lake has remained below the TMDL since 2004 and in several years has been less than 1,000 lb/day as NH₃.

As a result of the decreased loads, ammonia concentrations within Onondaga Lake have decreased substantially since tertiary treatment began at Metro. Ambient monitoring program (AMP) ammonia concentrations averaged over the upper 9 m of the lake are shown in Figure 2. The 1998 TMDL identified water quality standards for Onondaga Lake, the most stringent of which was 0.82 mg/L as NH₃ for the month of August. The monitoring data indicates the Lake has consistently met this limit year round for the past several years.

Discharge monitoring report data from February 2009 through March 2012 indicate that the average daily ammonia load from Metro was 336 lb/day as NH₃. Analysis of ammonia loading data from the major tributaries, collected as part of the Onondaga Lake AMP, indicates a 2005-2011 average load of 450 lb/day of ammonia as NH₃.

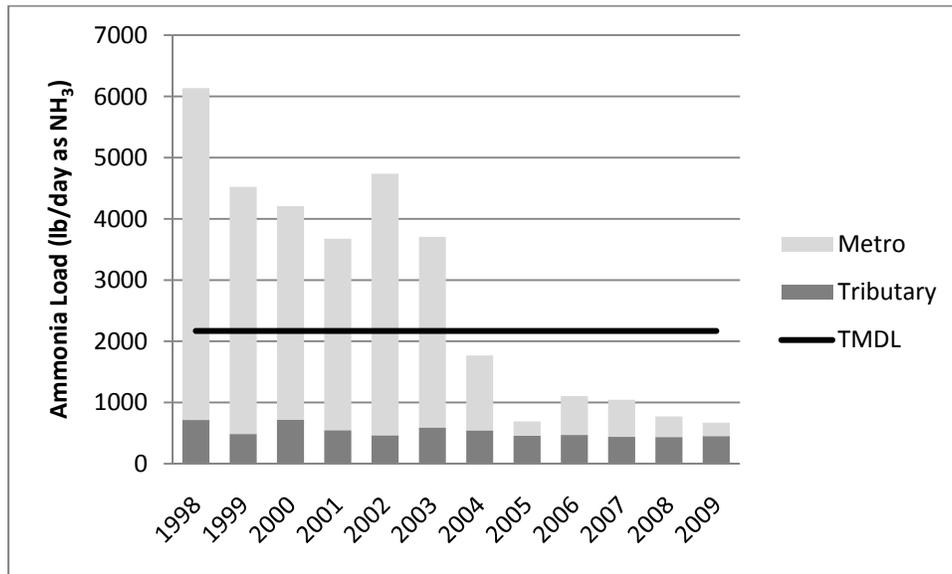


Figure 1: Ammonia loads delivered to Onondaga Lake. Tertiary treatment at Metro began operation in 2005. The 1998 TMDL established a TMDL of 2,170 lb/day as NH₃ for ammonia.

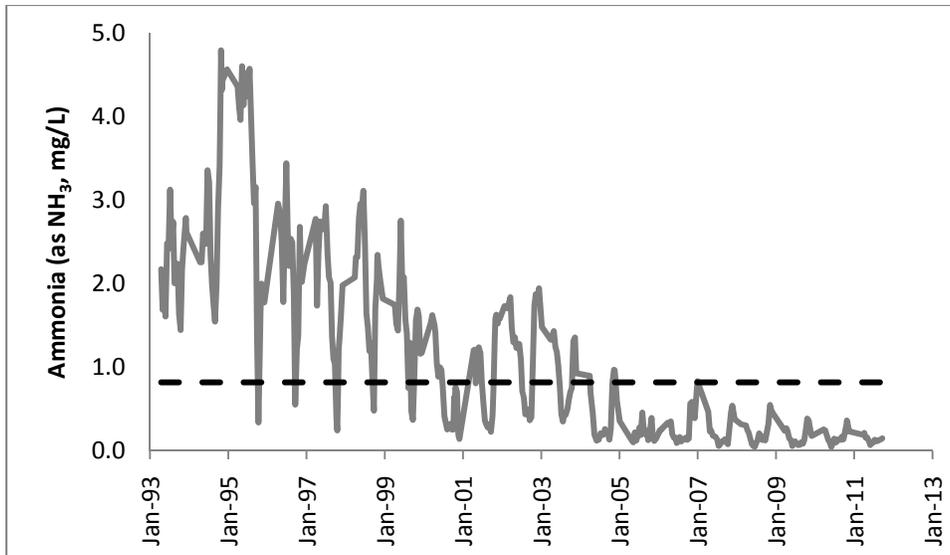


Figure 2: Ammonia concentration measured at South Deep AMP monitoring station.
 Data shown is the average of measurements taken from 0 to 9 m below the surface (solid line). The most stringent ammonia water quality standard identified in the 1998 TMDL was 0.82 mg/L as NH₃ (dashed line).

Amendment to the existing TMDL

The allocations for the amended TMDL are included in Table 2. The TMDL of 2,170 lb/day of ammonia as NH₃ will remain unchanged.

The WLA for Metro remains unchanged from the previous TMDL. A new WLA for the Honeywell GWTP of 163 lb/day of ammonia as NH₃ has been created. The WLA will be implemented as a 30 day average. As effluent from the GWTP is typically sent to Metro for further treatment, the estimated average load will be 29 lb/day of ammonia as NH₃. The new WLA is 1,503 lb/day of ammonia as NH₃.

The LA has decreased by 162 lb/day to 450 lb/day of ammonia as NH₃. Data from the AMP indicates tributary loads to the Lake have decreased substantially compared to the 1986 to 1995 data used in the 1998 TDML. This amendment converts some of the LA into WLA to accommodate the new discharge.

The 10% MOS is maintained under this amendment to the TMDL.

Table 2: Allocations for the amended TMDL. Note rounding errors may affect the total.

Source	Ammonia (lb/day as NH₃)
Metro (NY0027081)	1,340
Honeywell GWTP	163
WLA	1,503
LA	450
MOS	217
TMDL	2,170

Public participation

Public notice of the availability of the Amendment for public comment appeared in the December 19, 2012 Environmental Notice Bulletin. The comment period was open for 30 days. Comments received and NYSDEC responses follow.

Onondaga County

The notice of intent acknowledges that Onondaga Lake has achieved and continues to meet water quality standards for ammonia and is no longer listed as impaired on that basis. While the County is mindful of the regulatory need for vigilance to assure that water quality standards and concomitant loadings are not exceeded, the addition of the Honeywell load, which will be discharged to METRO except during periods of wet weather, can be easily assimilated within the current LA and WLA. Therefore, we suggest that no legal or factual basis exists at this time to amend the WLA and LA components of the ammonia TMDL.

Response: During discussions with NYSDEC, the U.S. EPA advised that because there is an existing TMDL which is still in effect, any point source which discharge ammonia to Onondaga Lake is to have a WLA specified in the TMDL. The amendment creates a WLA for the GWTP discharge and demonstrates that the addition of this discharge will not cause a violation of the TMDL or water quality standards.