

Progress towards water quality improvement: Secchi Disk Transparency. AMP 2009 Annual Report. (Guidance Value)

**AMENDED CONSENT JUDGMENT GOAL**

Eliminate turbidity as an impairment to use of the lake for water contact recreation. Improve water clarity to meet aesthetic quality and public bathing beach safety objectives.

<b>Hypotheses to be tested:</b>	<b>Status:</b>
Metro improvements and related nutrient load reductions result in improved water clarity (as measured by Secchi disk transparency) in Onondaga Lake	<ul style="list-style-type: none"> <li>• Since the 1990's, there has been an increase in the percent of summer Secchi disk measurements that exceed 1.5 m at the South Deep station</li> <li>• Over the past ten years of monitoring at the nearshore stations, there has been an increase in the percent of summer Secchi disk measurements that exceed the NYS DOH 1.2 m safety guidance value for bathing beaches.</li> </ul>

**Current Conditions with Historical Comparison**

Secchi Disk Transparency <i>(Jun 1 to Sep 30 average (standard deviation))</i>	<u>Time Period</u>	<u>South Deep Station (m)</u>	<u>Nearshore Stations (Class B &amp; C) (m)</u>
	1990-1997:	2.1 (0.47)	No data 1990 - 1998
Compliance with NYS AWQS and Guidance Value <i>(Jun 1 to Sep 30 average (standard deviation); No NY State standard or guidance value for Secchi disk transparency. NYS DOH bathing beach swimming safety guidance value of 1.2m)</i>	1998-2004:	1.9 (0.37)	1.5 (0.17) (starting 1999)
	2005-2008:	2.3 (0.98)	1.7 (0.30)
	2009:	3.2	1.3
	<u>Time Period</u>	<u>South Deep measurements % greater than 1.5 m</u>	<u>Nearshore (Class B &amp; C) % greater than 1.2 m</u>
	1990-1997:	54% (25%)	No data 1990 - 1998
	1998-2004:	62% (20%)	70% (15%) (starting 1999)
	2005-2008:	75% (17%)	85% (12%)
	2009:	100%	93%
	<u>2009 - Nearshore Stations Class B % measurements greater than 1.2 m</u>	<u>2009 - Nearshore Stations Class C % measurements greater than 1.2 m</u>	
	Bloody Brook: 100%	Ninemile Creek: 95%	
	Eastside: 100%	Harbor Brook: 100%	
	Maple Bay: 100%	Ley Creek: 90%	
	Wastebeds: 100%	Mid-south: 100%	
	Willow Bay: 100%	Onondaga Creek: 43%	
Factors Affecting Water Clarity	Algal abundance (depends on light, temperature, nutrients and grazing pressure), external loading of suspended solids, re-suspension of bottom sediments, precipitation of calcite, suspension of sediment from tributary high flow		

**Planned Load Reductions (1998 – 2012)**

Metro SPDES Permit Requirement	<ul style="list-style-type: none"> <li>• No SPDES requirement for Secchi disk transparency</li> <li>• Staged reduction in total phosphorus load from Metro</li> <li>• Staged implementation of CSO and watershed projects to reduce phosphorus loading from nonpoint sources</li> </ul>
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**Monitoring and Assessment Program**

Lake Monitoring <i>(Annual County monitoring program)</i>	<ul style="list-style-type: none"> <li>• Biweekly measurements of Secchi disk at South Deep (weekly between 5/1 and 9/30)</li> <li>• Nearshore Secchi disk measurements: weekly (summer). and following storm events</li> </ul>
Related Biological Monitoring	<ul style="list-style-type: none"> <li>• Phytoplankton and zooplankton abundance and community composition</li> <li>• Alewife hydroacoustic surveys</li> </ul>

### Library Reference 2.7.3

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(Guidance Value) – *continued*

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**Tools for Decision Making**

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Models	<ul style="list-style-type: none"><li>• Mass balance TP framework and linked empirical eutrophication model (William Walker)</li><li>• Onondaga Lake Water Quality Model (under development by QEA,LLC)</li></ul>
TMDL Allocations	Phosphorus - NYSDEC Phase I TMDL 8/27/97; Phase II TMDL by December 2011

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