

Progress toward water quality improvement: Secchi Disk Transparency. AMP 2010 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 for areas of the lake designated as public beaches.

| Hypotheses to be tested: | Status: |
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| 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"> • 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 • 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. |

Current Conditions with Historical Comparison

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| 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 & 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 (0.21) (starting 1999) |
| | 2005-2009: | 2.5 (0.93) | 1.6 (0.31) |
| | 2010: | 1.9 | 1.3 |
| | <u>Time Period</u> | <u>South Deep measurements % greater than 1.5 m</u> | <u>Nearshore (Class B & C) % greater than 1.2 m</u> |
| | 1990-1997: | 54% (25%) | No data 1990 - 1998 |
| | 1998-2004: | 62% (20%) | 70% (15%) (starting 1999) |
| | 2005-2009: | 80% (17%) | 86% (11%) |
| | 2010: | 75% | 89% |
| Factors Affecting Water Clarity | <u>2010 - Nearshore Stations Class B % measurements greater than 1.2 m</u> | <u>2010 - Nearshore Stations Class C % measurements greater than 1.2 m</u> | |
| | Bloody Brook: 100% Eastside: 100% Maple Bay: 100% Wastebeds: 100% Willow Bay: 100% | Ninemile Creek: 100% Harbor Brook: 100% Ley Creek: 90% Mid-south: 100% Onondaga Creek: 5% | |
| 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)

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

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

Library Reference 2.2.3

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(Guidance Value) – *continued*

Tools for Decision Making

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