



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
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Ms. Teresa Diehsner
Environmental Program Specialist
New York State Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, New York 12233

Re: **Cornell Lake Source Cooling Facility (NY0244747)**

Dear Ms. Diehsner:

On October 15, 2012, the New York State Department of Environmental Conservation provided notice of the draft modified State Pollutant Discharge Elimination System (SPDES) permit (SPDES No. NY0244747) for the Cornell University Lake Source Cooling Facility. In accordance with 40 CFR §123.44, the U.S. Environmental Protection Agency has reviewed the draft permit and provides the following comments for your consideration as NYSDEC develops the proposed and final permit. These comments must be satisfactorily addressed in order to eliminate the potential for permit objection pursuant to the 1975 Memorandum of Agreement between the EPA and NYSDEC and 40 CFR §123.44.

The EPA looks forward to working with the NYSDEC to ensure that the issues identified above are addressed to the satisfaction of the EPA. In accordance with 40 CFR §123.44, NYSDEC is required to send the EPA a proposed permit, as defined in 40 CFR §122.22, prior to the final issuance of the SPDES permit for the Cornell Lake Source Cooling facility.

If you require any information or assistance regarding this matter, please contact Ms. Karen O'Brien of my staff at obrien.karen@epa.gov or (212) 637-3717.

Sincerely yours,

Michelle A. Josilo, NPDES Section Chief
Clean Water Regulatory Branch

Enclosures

cc: Mr. Koon Tang, Director, Bureau of Water Permits,
New York State Department of Environmental Conservation (w/enclosures)

EPA Region 2 Comments on Draft State Pollutant Discharge Elimination System permit for the Cornell University Lake Source Cooling Facility (NY0244741)

The United States Environmental Protection Agency, Region 2, submits the following comments on the draft State Pollutant Discharge Elimination System (SPDES) permit for the Cornell University Lake Source Cooling Facility, public-noticed on October 15, 2012:

1. Effluent Limitations for Total Phosphorous

The current permit in effect for this facility was originally issued in 1998 prior to the Clean Water Act section 303(d) impairment listing for phosphorous, and prior to the commencement of discharge. The existing permit was modified in 2002, administratively renewed in 2003 with an expiration date of March 1, 2008, and is currently administratively extended.

The October 15, 2012 draft SPDES permit includes an interim limit of 6.4 lb/day for Total Phosphorous, and a final limitation of 4.8 lb/day for Total Phosphorous. The final limit takes effect upon 57 months from the effective date of a permit modification (EDPM), and is included as part of a compliance schedule to evaluate alternatives for extending the outfall pipe. It is our understanding that the permit would be modified if a total maximum daily load (TMDL) analysis indicated that the extension of the outfall pipe was necessary.

The fact sheet included with this permit includes the calculations and assumptions used to calculate the interim and final limitations. The final limitation of 4.8 lb/day is a mass-based, monthly average limitation, based on an existing effluent quality (EEQ) analysis of the effluent data from 2000 to 2009. The interim limitation of 6.4 lb/day is based on application of the applicable water quality guidance value for phosphorous of 20 ug/l, which is the numeric interpretation of the narrative water quality standard for protection of the designated use of ponded waters. The fact sheet also states that the EEQ limitation of 4.8 lb/day was calculated using statistical analysis procedures in EPA's *Technical Support Document for Water Quality Based Toxics Control (March 1991)*, which employs the 95th percentile confidence level of the lognormal distribution of past data. This approach calculates a maximum projected effluent that is demonstrated to be achievable based on past data, and is frequently used by EPA in permits and enforcement agreements.

While the interim limitation does represent the application of the standard at the end of the discharge pipe, the inclusion of an interim limitation and compliance schedule is not consistent with federal NPDES regulations for water quality based effluent limitations at 40 CFR §122.44(d), nor for schedules of compliance at 40 CFR §122.47. This is also in conflict with: (1) federal regulations addressing antidegradation at 40 CFR §131.12; (2) NYSDEC's own antidegradation policy referenced in the permit fact sheet *Water Quality Antidegradation Policy*, signed by the Commissioner of NYSDEC, dated September 9, 1985; and, (3) TOGS 1.3.9, *Implementation of the NYSDEC Antidegradation Policy – Great Lakes Basin Supplement to Antidegradation Policy* dated September 9, 1985.

Compliance schedules are allowable in the instance that a facility is unable to meet a final water quality based effluent limitation. Given that the facility has demonstrated its ability to

comply with a limitation of 4.8 lb/day as a monthly average, it is not appropriate to grant a compliance schedule with interim relief from that limitation. Additionally, the allowance of additional loading is not consistent with NYSDEC's antidegradation policy, which states that for waters in better condition than the applicable water quality standard, additional loading would only be allowed when both of the conditions below are met:

1. Allowing lower water quality is necessary to accommodate significant economic or social development in the affected areas, and
2. Water quality will be adequate to meet the existing usage of the waterbody when allowing a lowering of water quality.

In the case of the southern portion of Cayuga Lake, this waterbody is listed as impaired for phosphorous and silt/sediments. NYSDEC's antidegradation policy further states:

Water which does not meet the standards assigned thereto will be improved to meet such. The water uses and the level of water quality necessary to protect such uses shall be maintained and protected. (*Water Quality Antidegradation Policy*, signed by the Commissioner of NYSDEC, dated September 9, 1985)

This means that the permit must include a numeric effluent limit that requires the facility to maintain existing effluent quality. Specifically, the permit must include the limitation of 4.8 lb/day as the applicable monthly average limit, starting at the effective date of the permit in order to be consistent with antidegradation requirements and to prevent further degradation of the southern portion of Cayuga Lake.

The fact sheet also notes that in accordance with NYSDEC policy and NPDES regulations, the more stringent of the calculated effluent limitations shall be included in the permit. NYSDEC states that it is including the technology based limit of 4.8 lb/day which is more stringent than the water quality-based effluent limit of 6.4 lb/day. NYSDEC has actually included an interim limit and compliance schedule granting relief from the technology based limit of 4.8 lb/day. Federal regulations governing compliance schedules at 40 CFR §122.47 are only available for relief from *water quality-based* effluent limits, and only for achieving those water quality standards promulgated after 1977. Technology based requirements represent achievable levels, while compliance schedules are available where a facility has demonstrated that meeting limits based on water quality standards is not achievable. Given that the limit of 4.8 lb/day was calculated based on past data, using statistical calculations that project a maximum projected effluent, this level is achievable and inclusion of a compliance schedule is not appropriate.

2. Compliance Schedule for Evaluation of Outfall Extension

The EPA notes that the permit includes a schedule of compliance to evaluate the extension of the outfall pipe, and if warranted by the TMDL, to extend the pipe upon the effective date of permit modification. As noted above, this permittee has already demonstrated the ability to comply with the final effluent limitation of 4.8 lb/day as a monthly average. Therefore, the inclusion of a compliance schedule granting relief from the final limitation is not appropriate and does not meet the requirements of federal regulations for compliance schedules set forth

at 40 CFR §122.47. Specifically, this schedule has no standing and is not in effect unless the permit is modified, which may or may not take place in the future. Additionally, the extension of the pipe would address the impacts to the lake in terms of ability to provide mixing, but would not affect the quality of the effluent nor Cornell's ability to meet the final limitation of 4.8 lb/day.

This permit should include a requirement to evaluate extension of the outfall pipe and the potential impact of alternatives, because NYSDEC has contemplated this action for several years and may very well require such mitigation as the result of a TMDL analysis. However, the permit should include milestones triggered by the effective date of the permit, not a schedule of compliance granting an additional loading allowance of phosphorous, triggered only by a future permit modification.

3. Reasonable Potential Analysis for other Water Quality Based Effluent Limitations

There is no reasonable potential analysis in the permit fact sheet to determine whether there are other pollutants that cause, contribute, or have the reasonable potential to cause or contribute to a violation of water quality standards at the point of discharge. In accordance with 40 CFR §122.44(d), permitting authorities must establish effluent limitations that are protective of applicable water quality standards. NYSDEC has only analyzed this discharge and included a WQBEL for total phosphorous. The permit fact sheet and draft permit must address any pollutant sources that could potentially cause or contribute to an exceedance of water quality standards. This analysis would usually be based on a priority pollutant scan included with the permit application as well as NYSDEC's knowledge of the facility, e.g., whether additional chemicals are used to prevent fouling or to clean the cooling system, and in this case, the quality of the intake water. We note that the southern portion of Cayuga Lake is also listed as impaired for silt/sediments. However, there is no numeric limitation, monitoring requirement, or application of a water quality standard addressing the discharge of solids in the permit. NYSDEC must include water quality based requirements that are protective of water quality standards for all pollutants that cause or contribute to an exceedance of ambient criteria.

4. Requirements for In-lake Monitoring to Support the Total Maximum Daily Load

The permit includes the requirement to conduct in-lake monitoring to support development of a TMDL. We support this condition of the permit and recommend that this section be made more specific with respect to deadlines for submittal. For example, we note that there is a milestone due date for the submittal of a Quality Assurance Project Plan (QAPP), and that the implementation schedule of the QAPP will become an enforceable schedule of the permit. This schedule will be written by the permittee and approved by NYSDEC. The EPA recommends that, at a minimum, NYSDEC also establish a due date within the permit for the commencement of monitoring, which could be triggered by NYSDEC approval of the QAPP. We also recommend that the permit include final due dates for completion of analytical monitoring and for developing the modeling plan.

5. Requirements to Minimize Impingement and Entrainment at the Cooling Water Intake Structure

The biological monitoring requirements of the permit require an *Entrainment Characterization Study*, which will be used by the NYSDEC to determine whether additional technological controls are necessary to meet the performance goals of the NYSDEC Commissioner's policy (CP-52), which established closed-cycle cooling, or equivalent performance, as the Best Technology Available, as required by section 316(b) of the Clean Water Act. The permit does not address the minimization of adverse impact due to impingement of fish unless the permit is reopened and modified to address additional controls for entrainment. Clean Water Act section 316(b) requires a determination of BTA for both impingement and entrainment. Given that the facility has been in operation for several years, and monitoring was required in the previous permit, this permit should require a specific definition of what best technology available would be for the impingement of aquatic life at the intake structure. The permit must state the specific controls, including existing controls, as an enforceable permit condition, and the fact sheet must document the assumptions that lead to the conclusion that these controls represent BTA.

6. General Conditions.

The draft permit does not adequately incorporate general permit conditions as required by federal regulations. As specified in 40 CFR §122.41, all conditions applicable to NPDES permits and corresponding state programs shall be incorporated into permits either expressly or by reference. If incorporated by reference, a specific citation to these regulations (or the corresponding approved state regulations) must be given in the permit. The NYSDEC *must* include in the permit, either expressly or by reference, all general conditions specified in 40 CFR §122.41.

December 19, 2012

VIA EMAIL AND U.S. MAIL

Teresa Diehsner
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233

**Re: Comments on Draft SPDES Permit Renewal
Cornell University Lakesource Cooling System Discharges into South Cayuga Lake
Tompkins County, New York
SPDES Permit # NY0244741
DEC #7-5099-0009/0001**

Dear Ms. Diehsner:

These comments on the draft SPDES permit renewal for the Cornell University Lake Source Cooling ("LSC") discharge are submitted on behalf of the Cayuga Nation Council, the governing body of the Cayuga Nation; Tompkins County Legislator Pamela Mackesey; City of Ithaca Councilwoman Cynthia Brock; Cayuga Lake shoreline owners Joseph Francis and Timothy Hinkin; and City of Ithaca resident Walter Hang, each of whom has previously joined in a 60-day Notice of Intent to Sue dated August 28, 2012 regarding the LSC discharges ("Notice Letter") pursuant to Clean Water Act §§ 505(a)(1), 505(a)(2) and 505(b), 33 U.S.C. §§ 1365(a)(1), 1365(a)(2) and 1365(b).

As discussed in detail below, the draft SPDES permit (the "Draft Permit") must be modified because, as currently drafted, it violates several key provisions of the Clean Water Act and fails to address the legal deficiencies identified in the Notice Letter. Specifically, the draft permit violates the Clean Water Act because it impermissibly (i) allows the Cornell LSC to continue discharging phosphorous into South Cayuga Lake, even though that portion of the lake has failed for years to meet water quality standards and has been listed by DEC as impaired due to nutrients, including phosphorous; (ii) allows the Cornell LSC to continue discharging phosphorous at levels that are causing or contributing to a violation of water quality standards; (iii) allows the Cornell LSC to increase its discharges of phosphorous into South Cayuga Lake under both the so-called "interim" and "final" proposed effluent limits, and therefore fails to include an effluent limitation that will ensure that water quality standards are maintained; (iv) fails to require implementation of Best Technology Available ("BTA") for the Cornell LSC cooling water intake structures; and (v) includes compliance schedules that lack any real or enforceable deadlines or milestones and thus violate the regulatory standards for compliance schedules.

Additionally, the draft permit is legally defective because it further postpones, for an indefinite period, DEC's establishment of a TMDL for phosphorous in South Cayuga Lake and fails to set forth a reasonable, verifiable, and concrete timeline for establishing a TMDL. Furthermore, the draft permit improperly seeks to place the main responsibility for developing a TMDL on Cornell. This is objectionable because Cornell's discharges are one of the main reasons why South Cayuga Lake is impaired, Cornell has demonstrated its lack of objectivity in interpreting monitoring data from the lake, and Cornell has a partisan interest in ensuring that no modifications to its LSC are imposed as a result of establishing a TMDL.

Finally, the permit proposes to eliminate the monitoring program for South Cayuga Lake required by the existing permit. DEC should maintain the monitoring program as a condition of the permit because it is the only means by which the contribution of the Cornell LSC to water quality problems in South Cayuga Lake can be identified and assessed on a regular, ongoing basis.

I. DEC Improperly Excluded Other Interested Parties From Discussions Prior to Issuance of the Draft Permit

At the outset, it must be noted that the process by which DEC has drafted the Cornell LSC SPDES permit renewal has been, to say the least, exclusionary and falls far short of the open public process envisioned by the Clean Water Act. Throughout the development of the draft permit, DEC has communicated exclusively with Cornell. Until it issued the Draft Permit, the Department made no effort to communicate with other interested parties, even after receiving the Notice Letter.

DEC's failure to include other interested parties in discussions regarding the draft permit is particularly puzzling in light of DEC Commissioner's Policy 42, "Contact, Cooperation and Consultation With Indian Nations" ("CP-42"). CP-42 requires that DEC consult "Indian Nation representatives on a government-to-government basis regarding matters affecting Indian Nation interests." CP-42 at 4. "Affecting Indian Nation interests" is defined by the Policy as "a proposed action or activity, whether undertaken directly by the Department or by a third party requiring a Department approval or permit, which may have a direct foreseeable, or ascertainable effect on environmental or cultural resources of significance to one or more Indian Nations, whether such resources are located on or outside of Indian Nation Territory."

The renewal of the Cornell LSC SPDES permit clearly affects the Cayuga Nation's interests within the meaning of CP-42. Cayuga Lake is sacred to the Cayuga Nation and has been the center of their aboriginal homeland for thousands of years. The Cayuga Nation territory as recognized by the Treaty of Canandaigua extends around the shores of Cayuga Lake. Moreover, DEC has been on notice since at least 1999 of the Nation's interest in the Cornell LSC discharges. Indeed, any doubt as to the Nation's interest in this matter should have been resolved by the Nation joining in the Notice Letter.

Unfortunately, despite the Nation's clear interest in the matter, DEC failed to consult – or even contact – the Nation until after the Draft Permit had already been issued. In fact, DEC did not contact the Nation until one of the Nation's attorneys sent a letter to DEC Commissioner Martens reminding him of the duty to consult under CP-42.

None of the other interested parties who joined in the Notice Letter were invited by DEC to discuss the Draft Permit terms prior to its issuance, nor were any of them contacted by DEC. In fact, the only communication received in response to the Notice Letter was a telephone call from DEC Deputy General Counsel Edward McTiernan the afternoon before the Draft Permit issued and then a follow-up letter dated October 26, 2012 – nearly one week after the draft SPDES permit was issued.

Not surprisingly, this closed, one-sided process has resulted in a draft permit that requires no changes to the LSC discharges and imposes no concrete obligations on Cornell to reverse the decline in water quality caused by its discharges.

II. The Draft Permit Allows the Cornell LSC to Continue to Discharge Phosphorous Into South Cayuga Lake in Violation of the Clean Water Act

DEC first identified South Cayuga Lake as not meeting water quality standards in 1998, prior to commencement of discharges from the Cornell LSC. Although the first SPDES permit for the Cornell LSC was issued in January 1998, the facility did not actually begin discharging to South Cayuga Lake until July 17, 2000 – two years and seven months after the permit was issued and more than two years after the initial designation of South Cayuga Lake as impaired.

Because no discharges from the Cornell LSC had yet commenced at the time South Cayuga Lake was first listed as impaired due to nutrients, the original permit should have been modified to prohibit any discharges of phosphorous. The failure to modify the stale SPDES permit after the listing of South Cayuga Lake and before any discharges commenced allowed new discharges of phosphorous to South Cayuga Lake in violation of CWA §§ 301(a) and 402, 33 U.S.C. §§ 1311(a) and 1342, and 40 C.F.R. §§ 122.4(i), 123.25 and 122.44(d) (prohibiting the issuance of a permit to a new source if the discharge from that source will cause or contribute to a violation of water quality standards).

The draft SPDES permit continues this violation of the Clean Water Act by impermissibly allowing Cornell to continue to unlawfully discharge phosphorous into a water body that does not meet water quality standards and that is listed as impaired for phosphorous.

The permit must be revised to require closed cycle cooling, outfall relocation, or some other control technology to ensure that the LSC does not discharge phosphorous into South Cayuga Lake.

III. The Draft Permit Violates the Clean Water Act Because It Allows the Cornell LSC to Continue Discharging Phosphorous at Levels That Are Causing or Contributing to a Violation of Water Quality Standards

High levels of phosphorous in South Cayuga Lake have caused or contributed to algal blooms of increasing duration and severity, together with increased growth of other aquatic nuisance species, including aggressive invasive species such as *Hydrilla*. The increased growth of aquatic vegetation resulting from phosphorous discharges into South Cayuga Lake violates the water quality standard for Class A waters set forth in 6 NYCRR § 703.2 (“[n]one in amounts that will result in algae, weeds and slimes that will impair the waters for their best usages”). The best

usages of South Cayuga Lake, including swimming, boating, fishing and other recreational and aesthetic uses, have been impaired as a result of increased aquatic vegetation growth attributable to phosphorous.

South Cayuga Lake is listed by DEC as impaired pursuant to CWA § 303(d), 33 U.S.C. § 1313(d). DEC first listed South Cayuga Lake as impaired due to nutrients, including phosphorous, in 1998. Cornell's discharges of phosphorous are causing or contributing to a violation of water quality standards and therefore violate CWA §§ 301(a) and 402, 33 U.S.C. §§ 1311(a) and 1342. Thus, the draft permit's proposal to allow those discharges to continue violates these provisions of the Clean Water Act.

The draft permit also violates Clean Water Act anti-degradation requirements by allowing Cornell to increase its discharges of phosphorous over current and historic levels. *See* 40 CFR § 131.12; DEC *Water Quality Antidegradation Policy, Organization and Delegation Memorandum No. 85-40* (Sept. 1985); DEC's Technical and Operational Guidance Series (TOGS) 1.3.9, *Implementation of the NYSDEC Antidegradation Policy – Great Lakes Basin*.

The draft permit also violates TOGS 1.3.6, *Phosphorous Removal Requirements for Wastewater Discharges to Lakes and Lake Watersheds*, because it fails to impose Best Treatment Technology for phosphorous as required by that TOGS.

The permit must be revised to require closed cycle cooling, outfall relocation, or some other control technology to ensure that the LSC does not discharge phosphorous into South Cayuga Lake.

IV. The Draft Permit Violates the Clean Water Act And The Department's Antidegradation Policy Because It Allows the Cornell LSC to Increase its Discharges of Phosphorous Into South Cayuga Lake

Rather than addressing the violations of water quality standards in South Cayuga Lake by requiring that the Cornell LSC cease its discharges of phosphorous into that portion of the lake, the draft permit allows Cornell to increase those discharge over historic and current levels.

According to discharge data in the United States Environmental Protection Agency (USEPA) ECHO database, the average contribution of phosphorus from LSC has nearly doubled since it first started operating in July 2000 and now stands at 2.78 pounds per day, year-round. Moreover, the contribution during the high-flow summer months of June through September, when algae and weeds proliferate, now stands at 4.56 pounds per day.

The proposed "final" effluent limit for phosphorous of 6.4 lbs/day represents a 70% increase over the LSC's average year-round contribution of 2.78 lbs/day. Of even greater concern is the fact that the "interim" daily limit of 6.4 lbs/day, which would inexplicably be in effect indefinitely, would allow for a phosphorus loading increase of 22% over the highest single-month daily average on record (5.26 lbs/day in July 2011). The interim limit allows a 40% increase over the facility's high-flow summer average and a staggering 130% increase over the year-round daily average.

Thus, the effluent limitations for phosphorous in the draft permit would exacerbate, rather than eliminate, the water quality standard violations caused by the Cornell LSC discharges in violation of CWA §§ 301(a) and 402, 33 U.S.C. §§ 1311(a) and 1342.

Moreover, this effluent limitation violates the Department's own antidegradation policy. NYSDEC's September 9, 1985 Water Quality Antidegradation Policy ("WQA Policy") states that "water which does not meet the standards assigned thereto will be improved to meet such." (WQA Policy at 2.) The WQA continues that "the water uses and the level of water quality necessary to protect such uses shall be maintained and protected." (Id.)

This means, at a bare minimum, that the Draft Permit must include a phosphorus effluent limit that is at least as restrictive as the actual average discharge from the facility. In other words, the Draft Permit cannot include any limitation in excess of 4.8 lbs/day as the applicable monthly average limit, and it must impose that limit immediately in order to prevent further degradation of the southern portion of Cayuga Lake.

Of course, even that limit will not suffice as empirical data show that the water quality in the southern end of Cayuga lake continues to degrade. The final Permit must therefore be revised to require closed cycle cooling, outfall relocation, or some other control technology to ensure that the LSC does not discharge phosphorous into South Cayuga Lake.

VI. The Draft Permit Violates the Clean Water Act Because it Fails to Require Implementation of BTA for the Cornell LSC Cooling Water Intake Structures

CWA §§ 316(b) and 402, 33 U.S.C. §§ 1316(b) and 1342, and 6 NYCRR § 704.5 require that cooling water intake structures "shall reflect the best technology available for minimizing adverse environmental impact." DEC Commissioner Policy #52 ("CP-52"), "Best Technology Available (BTA) for Cooling Water Intake Structures," establishes that, for existing facilities such as Cornell's LCS that are designed to withdraw at least 20 MGD of which at least 25% is used for contact or non-contact cooling, BTA is "[w]et closed cycle cooling or its equivalent." CP-52 at 2.

Cornell's LCS is not a wet closed cycle cooling system or its equivalent, and thus violates the BTA requirements of the CWA. The draft permit fails to require implementation of BTA for either impingement or entrainment, and thus also violates the Clean Water Act. Instead, the draft permit only requires Cornell to gather more entrainment data, even though DEC already has five years of entrainment data from Cornell collected during 2000-2005. Neither the draft permit nor any of the supporting documentation provided by DEC provides any explanation of why additional entrainment data is necessary, or why BTA cannot be determined and imposed based on the five years of data already collected.

Moreover, the compliance schedule in the draft permit includes no deadline for facility compliance with BTA requirements; according to the schedule, installation of BTA compliant technology will likely not occur until 2017, and may not occur until years later.

VII. The Compliance Schedules in the Draft Permit Violate the Clean Water Act Because They Either Impermissibly Delay Compliance or Fail to Include Real or Enforceable Deadlines or Milestones

Section 750-1.2(74) of DEC's regulations defines a schedule of compliance as "a schedule of remedial measures including an enforceable sequence of actions or operations leading to compliance with an effluent limitation, other limitation, prohibition, or standard." (Emphasis added). The draft permit includes compliance schedules for (i) implementation of a "final" effluent limitation for phosphorous, (ii) design and implementation of an "Outfall Redesign Study," and (iii) implementation of BTA requirements. However, none of the compliance schedules comply with § 750-1.2(74) because they either impermissibly delay compliance or fail to include an "enforceable sequence of actions or operations" as described below:

- The draft permit sets a "final" effluent limitation for P of 4.8 lbs/day that does not become effective until "EDPM plus 57 months." However, there is no justification for delaying compliance with a more stringent effluent limitation; the Cornell LSC is already discharging P at levels well below even the proposed "final" effluent limitation, and is thus capable of achieving a more stringent limitation upon EDPM.
- The draft permit requires Cornell to develop plan for an "Outfall Redesign Study" in order to eliminate the water quality impairment caused by the existing discharge. Under the compliance schedule in the draft permit, the plan for the study is not due until 9 months after EDPM, and all subsequent "deadlines" are based on actions by the applicant or DEC for which no enforceable timetable or deadline is established. Moreover, the draft permit provides that even these non-existent "deadlines" can be extended at Cornell's request or by DEC. Thus, there are no enforceable deadlines by which Cornell must undertake changes to its discharges to eliminate the current violations of water quality standards.
- As noted above, the draft permit includes a compliance schedule for BTA that includes no deadline for facility compliance with BTA requirements; according to the schedule, it is likely that installation of BTA compliant technology will not occur until 2017 at the earliest.

The compliance schedules in the draft permit also run afoul of § 750-1.14(a), which provides:

Among the provisions of a SPDES permit there may be compliance schedules. The purpose of these schedules is to achieve compliance by the permittee with applicable effluent limitations, water quality standards, and other requirements applicable pursuant to the Part. With respect to any discharge that is not in compliance with applicable limitations, applicable water quality standards, or other applicable requirements, the department shall establish specific steps in a compliance schedule designed to attain compliance within the shortest reasonable time, consistent with the Act and ECL, article 17.

(Emphasis added).

The open-ended compliance schedules in the draft permit, which contain no enforceable deadlines or milestones, allow Cornell's non-compliance with Clean Water Act requirements to continue for years into the future. To the extent that any timetables exist, they delay compliance by many years. Thus, the draft permit's compliance schedules also fail to meet DEC's regulatory requirement that they be designed to attain compliance "within the shortest reasonable time."

VIII. The Draft Permit Makes Clear That DEC is Impermissibly Postponing For Years Establishing a Phosphorous TMDL for South Cayuga Lake

The draft permit is legally defective because it further postpones, for an indefinite period, DEC's establishment of a TMDL for phosphorous in South Cayuga Lake and fails to set forth a reasonable, verifiable, and concrete timeline for establishing a TMDL.

Rather than establishing a TMDL for phosphorous in Cayuga Lake, DEC has incorporated a requirement in the draft permit that Cornell undertake a water quality model plan. The schedule for developing the plan, getting DEC approval of the plan, implementing the plan, analyzing results and developing a TMDL are left completely open-ended in the permit. As is the case with the permit's compliance schedules, establishment of the TMDL is not subject to any enforceable deadlines or milestones. Thus, there continues to be no deadline for development or implementation of a TMDL for phosphorous in Cayuga Lake.

Furthermore, the draft permit improperly seeks to place the main responsibility for developing a TMDL on Cornell. This is objectionable because Cornell's discharges are one of the main reasons why South Cayuga Lake is impaired, Cornell has demonstrated its lack of objectivity in interpreting monitoring data from the lake, and Cornell has a partisan interest in ensuring that no modifications to its LSC are imposed as a result of establishing a TMDL.

IX. The Final SPDES Permit Should Retain the Existing South Cayuga Lake Monitoring Requirements

DEC's initial issuance of the SPDES permit was based on Cornell's claims that the phosphorous in its discharge would not reach the southern end of Cayuga Lake. However, subsequent monitoring has proved those claims to be incorrect, and have instead shown that Cornell's discharges are contributing to the phosphorous problem in the southern end of the lake, thereby violating water quality standards.

DEC should maintain the monitoring program as a condition of the permit because it is the only means by which the contribution of the Cornell LSC to water quality problems in South Cayuga Lake can be identified and assessed on a regular, ongoing basis.

X. Conclusion

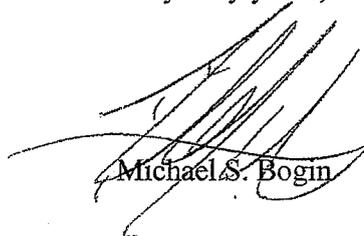
For the reasons set forth above, the draft SPDES permit fails to comply with key provisions of the Clean Water Act and DEC's regulations. Nearly all of these compliance issues could be resolved through the simple expedient of including in the permit a requirement that closed cycle cooling be instituted for the LSC in accordance with a compliance schedule that includes enforceable, date certain deadlines and milestones. This would have the dual benefit of

eliminating Cornell's unlawful phosphorous discharges to South Cayuga Lake and ensuring compliance with DEC's BTA policy.

Additionally, DEC should commit to an aggressive and enforceable schedule for establishing a (long overdue) phosphorous TMDL for South Cayuga Lake. For the reasons discussed herein, it is essential that Cornell not be given primary authority for assisting in development of the TMDL; rather, DEC should engage an independent consultant to provide such assistance.

Thank you for the opportunity to provide these comments.

Very truly yours,



Michael S. Bogin

C: J. Tierney, Asst. Commissioner for Water Resources
E. McTiernan, Deputy General Counsel
M. Klotz, Director, Division of Water
J. Matthews, Director, Clean Water Division, EPA Region 2
J. Gratz, Deputy Director, Clean Water Division, EPA Region 2
M. Josilo, NPDES Section Chief, EPA Region 2



TOMPKINS COUNTY
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To: Teresa Diehsner, NYSDEC
Tompkins County Water Resources Council
Wade Wykstra, Chair, Special Joint Committee

From: Tompkins County Environmental Review Committee

Date: December 17, 2012

Re: Draft Permit for Cornell's Lake Source Cooling Facility

The Environmental Review Committee (ERC) is a committee of the Tompkins County Environmental Management Council (EMC). The ERC has followed the development of Cornell's Lake Source Cooling project for many years, and has reviewed and commented on various aspects of it, including the SPDES permit and attempts to renew it. We have also been represented on the Cayuga Lake Monitoring Partnership with Cornell and the Tompkins County Water Resources Council.

The ERC has reviewed the Draft Permit and, in general, we support the permit issuance with the stipulated conditions. In our view, the monitoring and development of a phosphorus model for the lake will be far more scientifically valuable than a continuance of the current point sampling that has been done for over a decade now.

We also are strongly supportive of the requirement for community participation in this process.

We do have several questions and suggestions regarding the permit.

- Entrainment study- The best available mitigation mechanisms to limit entrainment of organisms should be installed at the intake to repair the accidental loss of the system many years ago. A characterization of the taxa and estimated numbers of organisms entrained may contribute to an understanding of potential impact on the lake food web and we request that the entrainment study continue with emphasis on that issue.
- Outfall design and location study- This topic continues to be of local interest and concern, as LSC mobilizes phosphorus from the deeper, cooler part of the lake and deposits it in the shallow southern end. We suggest this separate task be accomplished sooner. It does not need to take several years to get to. The scientific/engineering expertise needed for this can be done by persons other than those consultants Cornell has identified for other tasks.
- Sediment Transport- Sediment and phosphorus have an affinity. We believe that an understanding of the movement of sediment into the lake will be important to understanding Phosphorus movements into the lake and we would like some attention to this in the modeling effort.

- Hypolimnetic SRP- Levels of soluble reactive phosphorus are rising not only in Cayuga Lake but in other lakes in New York as well. The phosphorus study should attempt to understand and characterize the causes of this rise in SRP. Dreissenid mussels have been found to contribute to the alteration of nitrogen and phosphorus cycles and may be connected to these increases in SRP. We view these as important effects to understand in order to accurately model phosphorus in the lake.
- Community Participation- Many in the community are hoping for real engagement, not just occasional presentations. For example, the “community participation” handled by Ecologic in connection with the City of Ithaca’s dredging project left a bad feeling with the public for the infrequency of information and the one-way style of communication.

Additionally, we think it is important for a DEC representative to be present and involved regularly for discussions regarding this modeling effort. Jeff Myers, NYSDEC Director Bureau of Water Assessment and Management attended our 12/13/12 EMC meeting for a discussion on TMDLs and the SPDES permit renewal and we hope this will be only the beginning of direct DEC involvement.

The provision of a short comment period is not a satisfactory substitute for direct engagement of the interested parties and stakeholders from the inception of such a complex proposal. The other point source dischargers in Cayuga Lake were unaware of, and did not participate in, the design of, and selection of consultants for, this project. Yet they will be substantially affected by TMDLs which may result from this project. Would NYSDEC be willing to conduct face to face meetings with other stakeholders to discuss both the design and the implementation of this project? We believe that this would help to create meaningful community participation.

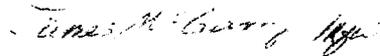
- Phosphorus Limits- The two phosphorus figures of 4.8 and 6.4 lbs/day caused some confusion among the reviewers. It is unclear why these two different limits were calculated, and further, why the higher limit was selected. The interim phosphorus limit of 6.4 lbs/day, specified in the draft permit, seems to have been arrived at by calculating the system’s capacity, while the 4.8 lbs/day reflects the system’s recent average use.

We are aware that interim limits are often used to give a permittee time to comply with new conditions. But such a case is not this case. Historical data indicate that the Lake Source Cooling process has delivered less than 4.8 lbs/day to the south shelf over the last ten years. So the selection of the lower limit will give Cornell no great difficulty in complying. They just won’t be able to grow their use of the system for the term of the study. Selecting the higher limit will allow increased phosphorus deliveries from this source while in recent years this community has expended considerable resources in reducing phosphorus outputs from two waste water treatment facilities. This does not seem sensible.

Rather than using the 6.4 lbs/day as the interim enforceable effluent limit and imposing the 4.8 lbs/day limit at the conclusion of the compliance schedule period, it would be more environmentally cautious to select the 4.8 lbs/day limit as the interim enforceable effluent limit, as it better reflects the recent past and current conditions under which Lake Source Cooling has been operating. We strongly recommend the permit specify 4.8 lbs/day and await the further study results before any further change to this limit

- Lake monitoring- Current monitoring under the existing LSC permit should continue until the new permit is adopted and monitoring under the new conditions can begin. We envision this sometime during 2013. We feel it quite important that there be no cessation of monitoring.
- Peer Review- The proposal anticipates that Cornell will utilize in-house staff to conduct the research for the modeling project. Cornell has stated that their work will be peer reviewed. What is the process that has been established for such peer review? Similarly the work of the consultants under contract to Cornell should receive an independent review by an appropriately qualified scientist or review panel. Employer-employee and principal-agent relationships create, at a minimum, a perception of conflict of interest. Given the long-term controversial nature of the Lake Source Cooling project, with conflicting claims on the degree of ecological impact, if any, of the transferred phosphorous, peer reviewers should be sought who are well outside Cornell's sphere of influence. We view this as absolutely essential to allaying the skepticism that exists regarding conflicts of interest.
- TMDL development- The permit should make clearer than it presently does that a TMDL would only be developed for the southern end of the lake, not the entire lake. We also believe that a significant reconsideration needs to be given to the designated "uses" for the south end of the lake which have resulted in its being listed as an impaired water body for which a TMDL is required.

Respectfully,



James McGarry, Chair
Environmental Review Committee
Tompkins County Environmental Management Council

Tompkins County Water Resources Council

121 East Court Street, Ithaca, N.Y. 14850
Telephone (607) 274-5560 Fax: (607) 274-5578
www.tompkins-co.org/planning/committees.html

RECEIVED
DEC 18 2012
NYSDEC

December 17, 2012

Ms. Teresa Diehsner
NYSDEC
625 Broadway
Albany, NY 12233-1750

Dear Ms. Diehsner,

The Water Resources Council (WRC) is an advisory board of the Tompkins County Legislature. The WRC approved a Joint Statement (attached) detailing the collaborative partnership between the WRC and Cornell University in 2007. The Joint Statement supports a more holistic monitoring approach and community involvement in decision making processes involving Cayuga Lake.

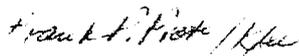
The WRC generally supports the proposed modified SPDES permit for Cornell University's Lake Source Cooling facility because the suggested monitoring is more comprehensive than the point samples that are currently collected and because of the express engagement of stakeholders in the process. We hope that public participation will not be limited to periodic meetings or progress reports but will provide meaningful and appropriate engagement of stakeholders in parts of the permit that address Cayuga Lake's health and future management.

We recognize that renewal of SPDES permits is routinely accomplished with little public input and does not usually require active participation from the DEC in a public dialogue. However, concerns about the state of the south end of Cayuga Lake have been long standing. We request the DEC take an active leadership role in this community discussion and provide a lead contact person to address questions/concerns and attend local meetings. The WRC would like to extend an invitation to said DEC contact person to attend one of our regularly scheduled meetings as part of this community discussion.

Specific comments/questions/criticisms related to the proposed permit are attached in list form to this letter. The WRC requests a response to our comments.

The Water Resources Council will provide comments on the topic of a Total Maximum Daily Load in a separate letter to both the DEC and EPA.

Cordially,



Frank P. Proto
Chairman, Water Resources Council

cc: Joe Martens, Commissioner, Department of Environmental Conservation
Encl.

COMMENTS OF THE TOMPKINS COUNTY WATER RESOURCES COUNCIL
ON THE PROPOSED PERMIT FOR CORNELL'S LAKE SOURCE COOLING FACILITY

Entrainment Study

- The current focus of the entrainment study appears to be on equipment/process optimization. We would like to see the study modified to capture information on aquatic organisms from a foodweb perspective. If this cannot easily be done within the confines of the permit, we request that DEC perform such a study in advance of development of any new lake or watershed regulation.

Nutrient Model Development – Total Maximum Daily Load (TMDL)

- We request the DEC clarify its goals in developing a lake-wide nutrient model.
- We request the DEC meet with the community and explain the possible impacts of a TMDL
- The WRC will provide more detailed comments regarding a TMDL in a separate letter.

Nutrient Model Sampling

- Sampling for the nutrient model development should capture soluble reactive phosphorus (SRP) dynamics in the hypolimnion.
- DEC should be aware that hypolimnetic SRP levels have been rising in other regional water bodies. Data collected in Cayuga Lake should not be analyzed in a vacuum.
- The water-sampling regime should be designed such that it may help determine a cause for the rising hypolimnetic SRP concentrations.
- Zebra and quagga mussel studies should also be designed to capture possible relationships between the organisms and nutrient cycling.
- Sediment inputs are an important component in the determination of a phosphorus impairment for the south end of Cayuga Lake. The WRC recognizes that the Lake Source Cooling discharge does not introduce sediment to the lake. DEC should perform sediment sampling, total phosphorus load estimation and a determination of overall impacts of that loading on the impaired water body prior to developing any new lake or watershed regulations.

General Questions

- How does one develop a Quality Assurance Project Plan (QAPP) for a model?
- Please make publicly available the statistical analysis that resulted in the two phosphorus limits and any raw data necessary to perform the calculations. Please explain the two limits, the rationale for development of them and any changes that may result in phosphorus discharges through the duration of this proposed five year permit.

Community Involvement

- Local entities including but not limited to the Community Science Institute, the Cayuga Lake Watershed Network, the Cayuga Lake Watershed Intermunicipal Organization, the Water Resources Council, and the Tompkins County Environmental Management Council should be the primary contacts for data collection and/or public outreach. Non-local entities (e.g., consultants) should only be engaged when the services cannot be provided locally.

- The WRC requests an opportunity for public, or stakeholder, comment on any plans (and/or QAPP's) before their approval by DEC.
- We request that a separate QAPP, or plan, be developed for Community Involvement.
- DEC should meet with the community early next year to answer questions about the long range goals for Cayuga Lake implied in the permit.
- Stakeholders - and their roles - should be clearly defined. We envision different stakeholders wanting different levels of involvement.
- The general public should have opportunities for meaningful engagement throughout the process.
- DEC should lead stakeholder and community discussions.

Adopted by resolution of the Tompkins County Water Resources Council May 19, 2008

Promoting a community-based approach to lake monitoring

Joint statement detailing the collaborative partnership between the Tompkins County Water Resources Council and Cornell University

Project duration: On-going from implementation

Introduction

A healthy Cayuga Lake is one of the cornerstones of our community. It is the most notable icon of Tompkins County, providing fresh water, beautiful vistas, and abundant recreational opportunities. Its value to the community and region cannot be overstated.

One role of the Tompkins County Water Resources Council (WRC) is to protect our precious water resources. To this end the WRC has been supportive of the various ongoing local monitoring efforts in Cayuga Lake, including volunteer groups monitoring tributaries to the lake and Cornell's Lake Source Cooling (LSC) in-lake monitoring.

In 2004, prompted by the University's request to reduce its Department of Environmental Conservation (DEC) permit-required LSC monitoring in the southern end of Cayuga Lake, the WRC began a dialogue with Cornell and with the DEC. In October 2006, the WRC asked Cornell to enter into a partnership to collaborate on issues related to Cayuga Lake. Since then, a committee of the WRC, along with Cornell faculty and staff, has been working in cooperation with other entities to develop a more comprehensive community-based, monitoring program for the southern end of the lake.

Cornell has supported this initiative with both academic and financial resources so that enhanced monitoring can continue to provide the highest-quality information about the lake, while assuring the continuity of the ongoing water-quality data collection. As a result, new relationships have been formed, and the level of collaboration in this partnership is very promising.

This WRC committee along with Cornell faculty has now developed a monitoring plan that includes in-lake water quality monitoring and the redeployment of a Remote Underwater Sampling Station (RUSS), which provides instantaneous and accessible data about water quality and meteorological data via the Internet for all to use. The RUSS also provides important data related to the impact of storm events on the lake.

The WRC and Cornell University support a community-based program that will provide a greater level of understanding of Cayuga Lake and by extension other lakes around the world. We urge regulatory agencies and affected municipalities to support the creation and execution of this plan. In order to implement such a program, the WRC is supportive of Cornell's efforts to simplify its LSC permit requirements.

Scope of the WRC/CU Lake Monitoring Partnership:

1. **The Partnership.** Members of the WRC, with the help and expertise of relevant Cornell University faculty and staff, have developed a long-term strategic monitoring plan (SMP) for the southern end of Cayuga Lake. Input on this monitoring plan has been solicited from other professionals such as the United States Geological Survey, Upstate Freshwater Institute, the Community Science Institute, and other appropriate entities. The intent of this effort is to more effectively utilize available resources, both financial and intellectual, to foster a better understanding of Cayuga Lake and to assess its environmental health. The SMP will ultimately include physical, chemical, and biological parameters to be measured and assessed.

2. **Cornell University's Role.** Cornell has pledged to help fund this monitoring plan, while continuing to meet regulatory compliance requirements for its LSC facility. At present the University spends about \$100,000 annually on data collection and analysis. This financial support would be redirected to support the SMP. Testing of the water drawn through the plant will continue to be performed; however Cornell has requested that DEC remove the in-lake water quality monitoring from the permit. If the in-lake monitoring requirements remain as part of LSC's permit, then the financial resources necessary to perform the community-based

program will not be fully available from Cornell and will limit the scope of the SMP. Monitoring activities associated with the new SMP will be undertaken by the RUSS and some combination of City of Ithaca personnel, Cornell faculty and/or students, the Finger Lakes Institute, and DEC. Considerable additional funding from other sources will be necessary to initiate and continue all monitoring activities expected to be included in this plan. In addition, Cornell will continue to discuss with the County, and other appropriate entities, other ways it can support the health and understanding of Cayuga Lake and its watershed.

3. WRC role. The WRC will initiate and conduct communications with the general public, targeted stakeholders and the DEC about the need for a strategic (and more informative) monitoring plan for the southern end of Cayuga Lake, emphasizing that Cornell has offered to help formulate the plan and offset the cost of the associated monitoring.

4. Cayuga Lake Watershed. It is our hope that the Cayuga Lake Watershed Intermunicipal Organization and the Cayuga Lake Watershed Network will partner to build on the scope of the monitoring plan for the southern end of the lake, broadening it to the whole lake and associated watershed areas. Development and implementation of this broader plan will continue throughout 2008 and beyond, in accordance with community priorities, needs and available funding

5. Oversight. The Partnership will provide oversight of this effort. Cornell will develop and maintain a publicly accessible database and annual graphical summaries of key data collected via this partnership.

Information about Lake Source Cooling and Cornell

As background, LSC cools the buildings on Cornell's campus, replacing a system that relied on fossil-fuel combustion to generate large amounts of electricity to run conventional cooling equipment. Instead, LSC utilizes a renewable resource - the cool deep water of Cayuga Lake - by withdrawing 40-degree water from the lake at a depth of 250 feet through an intake located approximately two miles north of Stewart Park, and returning the 55 to 60-degree temperature water to the lake through a diffuser at a depth of 13 feet near the East Shore Marina. LSC also cools Ithaca High School.

LSC is a significant component of Cornell's efforts to reduce its ecological footprint. It replaced much of Cornell's former cooling system. The benefits are regional and global. Since 2000 the system has prevented the emission of approximately 75,000 tons of carbon dioxide, 300 tons of sulfur dioxide and 100 tons of nitrogen oxides due to the superior efficiency of the system as compared to conventional cooling. In addition, 40,000 pounds of CFC refrigerants were eliminated.

Lake water-quality monitoring conducted since 1994 can be used to add to our understanding of the lake. Although the southern end of Cayuga Lake is not suitable for public swimming because of the sediment that enters from the creeks, and is impaired for boating due to rooted water-plant growth, the scientific consensus to date is that LSC does not contribute to these conditions.

Cornell was recently required to submit an application for the 5-year renewal of the LSC facility's discharge permit. Cornell has again suggested that in-lake water quality monitoring be removed from the permit. If it is, then Cornell expects to redirect that annual cost, in combination with the community's resources, toward analyzing the health of the lake in a more holistic manner. Testing of water drawn through the LSC plant would continue to be performed. DEC has the ultimate authority to determine if and how the University's LSC-required monitoring will be done and controls when that decision will be made.

Cornell will continue to be a strong advocate for promoting the health of Cayuga Lake. For example, Cornell scientists can focus on community concerns about weed abundance or changes in the Cayuga Lake food web - addressing such key organisms as zebra mussels, alewife, *Mysis relicta* (tiny shrimp that live at the bottom of the lake), and other microscopic living organisms. Cornell faculty play a lead role in managing aquatic resources throughout the world, and can provide similar leadership for the local community.

dischargers in Cayuga Lake were unaware of, and did not participate in, the design of, and selection of consultants for, this project—yet they will be substantially affected by any TMDL that may result from this project. I request that NYSDEC amend its approach to development of this study to allow interested stakeholders the opportunity to comment on details of the study and implementation of this project before study details are finalized.

Phosphorus Limits- The two phosphorus figures of 4.8 and 6.4 lbs/day for this particular SPDES permit do not make much sense to me. The interim phosphorus limit of 6.4 lbs/day, specified in the draft permit, seems to have been arrived at by calculating the system's capacity, while the 4.8 lbs/day reflects the system's recent average use. I understand that interim limits are often used to give a permittee time to comply with new conditions. But that rationale is not relevant here. Historical data indicate that the Lake Source Cooling process has delivered less than 4.8 lbs/day to the south shelf over the last decade, so Cornell should have no difficulty in complying with this lower limit. Selecting the higher limit will allow increased phosphorus deliveries from LLSC while in recent years this community has expended considerable resources in reducing phosphorus outputs from two waste water treatment facilities. It seems highly inadvisable to allow the potential of increased LSC P during the study period. I strongly request the permit specify 4.8 lbs/day and await the study results before any further change to this limit

Lake monitoring- As we all learned at the December 13 EMC-sponsored community forum on the LSC permit, Cornell's consultant UFI proposes to gather samples from its center-of-lake monitoring sites along its chosen east-west transects for only one growing season (maximum of March–November in 2013). However, as was noted at that same forum, there is a significant difference in testing results in all stratifications for data collected in "wet" cf. "dry" years. We ask that DEC consider how this could affect model development and the model's usefulness.

With this proposed one-season protocol in mind, I call attention to EMC's comments on earlier proposed DEC permit modifications (e.g., Oct. 2, 2002). The EMC's Nov. 12, 2004, comment letter opposed Cornell's request to reduce its ambient water-quality monitoring from eight to two sites. In that 2004 letter the EMC also noted questions remained about meeting thermal discharge criteria and that DEC had still not defined the "mixing zone". I request an update on those latter two topics and DEC's view of their present-day relevance.

Current monitoring under the existing LSC permit - . These data represent the most complete data set we have on the southern shelf. Since UFI's proposed monitoring is only for 2013, it makes sense to continue to collect data from the current southern shelf monitoring during the approximate five years of the development of the lake/watershed models. I feel it quite important that there be no cessation of this monitoring as it might pick up important variation during the period of model development that may or may not lead to a TMDL. Peer Review- The proposal anticipates that Cornell will utilize in-house staff to conduct the research for the modeling project. Cornell has stated that their work will be peer reviewed. What is the process that has been established for such peer review? Similarly the work of the consultants under contract to Cornell should receive an independent review by an appropriately qualified scientist or review panel. Employer-employee and principal-agent relationships create, at a minimum, a perception of conflict of interest. Given the long-term controversial nature of the Lake Source Cooling project, with conflicting claims on the degree of ecological impact, if any, of the transferred phosphorus, peer reviewers should be sought who are well outside Cornell's sphere of influence. We view this as absolutely essential to allaying the skepticism that exists regarding conflicts of interest.

TMDL development- The permit should make clearer than it presently does that a TMDL would only be developed for the southern end of the lake, not the entire lake. It should also make clear that a significant reconsideration needs to be given to the designated "uses" for the south end of the lake that have resulted in its being listed as an impaired water body for which a TMDL is required.

I appreciate the opportunity to comment and request that I, along with others, receive a substantive reply to these comments.

Sincerely,

Dooley Kiefer
629 Highland Rd.
Ithaca, NY 14850 (work telephone: 607-273-3816 x310)

From: "Daniel Ramer" <dramer@cityofithaca.org>
To: <depprmt@gw.dec.state.ny.us>
CC: "Bill Gray" <BILLG@cityofithaca.org>, "Cynthia Brock" <cbrock@cityofitha...>
Date: 12/13/2012 12:37 PM
Subject: Lake Source Cooling Permit Comments
Attachments: 2012-12-13 DRAFT SPDES PERMIT.pdf

Please find attached the Ithaca Area Wastewater Treatment Facility Special Joint Committee comment letter regarding the draft permit for the Cornell University Lake Source Cooling point source. I would like to express our appreciation for the time extension and look forward to working with NYSDEC and other key stakeholders in developing a watershed based understanding of the ecological impacts of both Non Point and Point source discharges into the South End of Cayuga Lake.

Dan Ramer
Chief Operator Ithaca Area WWTF

From: "Daniel Ramer" <dramer@cityofithaca.org>
To: <depprmt@gw.dec.state.ny.us>
CC: "Bill Gray" <BILLG@cityofithaca.org>, "Cynthia Brock" <cbrock@cityofitha...>
Date: 11/16/2012 10:05 AM
Subject: Comment on Cornell U Lake Source Cooling Plant Permit Application
Attachments: SJC minutes 2012-11-14 RESOLUTION.doc

Ms Dieshner,

I have attached a resolution passed by the Ithaca Area WWTF Special Joint Committee. The Committee is the ownership group comprised of municipal representatives from the Town of Dryden, Town of Ithaca and City of Ithaca. The IAWWTF SJC is responsible for the treatment plant's permit and passed this resolution at its regular November board meeting on the 14th. I have been informed that the DEC has extended the comment period for another 30 days. This resolution has requested a sixty day extension.

Please feel free to contact me with any questions.

Thanks,

Dan Ramer

Chief Operator IAWWTF

ITHACA AREA WASTEWATER TREATMENT FACILITY

TOWN OF ITHACA

CITY OF ITHACA

TOWN OF
DRYDEN, OWNERS
525 THIRD STREET
ITHACA, NEW YORK 14850

(607)273-8381
FAX (607)273-8433

Teresa Diehsner
NYSDEC
625 Broadway
Albany, NY 12233-1750

December 12, 2012

Comments: Draft SPDES Permit, Lake Source Cooling, # NY0244741

Dear Ms. Diehsner,

The Ithaca Area Wastewater Treatment Facility, IAWWTF, is a multijurisdictional POTW owned by the City of Ithaca, Town of Ithaca, and the Town of Dryden. The design capacity of the facility is 13.5 MGD, with an average effluent volume of 6.0 MGD. The treated waters are discharged in the south shelf of Cayuga Lake. Since 2006 the IAWWTF has operated a tertiary treatment process that has decreased the phosphorus load from 23.1 to 9.8 Lb/day.

The Lake Source Cooling SPDES permit renewal requires the development of Cayuga Lake Model that provides data useful for TMDL development in accordance with State and Federal regulations. Cornell University has established a program to develop the permit-required Cayuga Lake Modeling Plan, under a schedule articulated in the permit, using their consultants and employees (www.cayugalakemodelingproject.cornell.edu). The group of stakeholders working on a modeling plan of Cayuga Lake should include a broad spectrum of interested parties and the official role and obligations of these stakeholders defined under DEC's oversight. The conclusions of the modeling plan should be applicable to the development of the TMDL required by NYSDEC and USEPA but not the sole basis for its development.

In the Great Lakes Basin, total phosphorus effluent limits are established within the context of the International Joint Commission (IJC) made up of the Great Lakes states and provinces. The IJC is an important stakeholder of the Cayuga Lake TMDL process and implementation and invited to participate on this process.

We propose that the current Lake Source Cooling permit-compliance monitoring protocol be continued and augmented by existing and future data to determine synergistic basin-wide conditions, causes and effects. This request is based on actual sampling data showing increasing concentrations of soluble reactive phosphorus in the hypolimnion of Cayuga Lake, and on NYSDEC analyses showing a possible link between the Lake Source Cooling discharge and changes in water quality in southeast Cayuga Lake. Monitoring ambient water quality is also needed to evaluate the success or failure of the TMDL implementation before Southern Cayuga Lake can be removed from the 303(d) list. Continuation and consistency in the location and frequency of existing monitoring will be important to achieving this objective.

The amount and quality of the data used to define the model should be based on EPA's Interim Final Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objectives Process (EPA QA/G-4) which at page 26 recommends that a one percent false positive and a one percent false negative decision error be the starting point for setting decision error rates. It further recommends that if the decision maker increases the decision error rate from one percent, that person "should document the reasoning behind setting the decision error rate and what the potential impacts may be on cost, resource expenditure, human health and ecological conditions."

To ensure that designated uses are appropriate, use attainability analysis should be considered for southern Cayuga Lake before a TMDL is developed (NRC 2001 Assessing the TMDL Approach to Water Quality Management <http://www.nap.edu/catalog/10146.htm>).

The October 11, 2012 letter from EPA to Mr. Mark Klotz, requesting the implementation of a TMDL plan for Southern Cayuga Lake should bring urgency to our request to ensure the meaningful involvement of all stakeholders in the initiative going forward.

Respectfully,



Wade Wykstra, Chair, on behalf of the Special Joint Committee membership, as follows:
Herb Engman, Town of Ithaca Supervisor
MaryAnn Sumner, Town of Dryden Supervisor
Svante Myrick, City of Ithaca Mayor
Rich DePaolo, Town of Ithaca Board
William Goodman, Town of Ithaca Board
Ellen McCollister, City of Ithaca Common Council
Cynthia Brock, City of Ithaca Common Council
Joe Solomon, Town of Dryden Board

SJC Resolution Regarding Lake Source Cooling Permit Application

November 14, 2012

WHEREAS the Ithaca Area Wastewater Treatment Facility (IAWWTF) is owned and operated by three municipal partners, City of Ithaca, Town of Ithaca and Town of Dryden, and

WHEREAS representatives of the municipal partners, including elected officials, form the Special Joint Committee (SJC) to oversee operations and fiscal management of IAWWTF, and

WHEREAS SJC is advised by expert technical staff, and

WHEREAS, in order to reduce its contribution of silt, phosphorous, sediment and pathogens contaminants as listed in the USEPA 303 D designation of impairment for the southern end of Cayuga Lake, IAWWTF has installed tertiary treatment for phosphorus at great expense to its taxpayers and ratepayers, and

WHEREAS the phosphorus removal system and other improvements have yielded significant reductions in the annual phosphorus load to Cayuga Lake from IAWWTF, and

WHEREAS the New York State Department of Environmental Conservation (NYSDEC) has issued a draft permit for Cornell University Lake Source Cooling (LSC), and

WHEREAS SJC recognizes that community stakeholders represented by the SJC must be involved in the research that will determine the process for creating a TMDL, and

WHEREAS SJC has an obligation to protect the interests of its taxpayers, ratepayers and Cayuga Lake.

Now, therefore be it

RESOLVED that the Special Joint Committee of the City of Ithaca, Town of Ithaca and Town of Dryden does not support the issuances of the draft SPDES permit of Lake Source Cooling at this time, and be it further

RESOLVED that this resolution be distributed to NYSDEC as a SEQR comment in conjunction with the draft permit, to the United State Environmental Protection Agency Region 2, to Governor Cuomo, to the state-level elected officials of the City of Ithaca, Town of Ithaca and Town of Dryden, and to Cornell University President Skorton, and be it

FURTHER RESOLVED that the SJC requests that NYSDEC extend its public comment period for 60 days.

To: Department of Environmental Conservation
From: Nelson G. Hairston, Jr.

Re: Cornell University's Lake Source Cooling Project SPDES Permit

I write to urge DEC to approve the SPDES permit for Cornell's Lake Source Cooling (LSC) Project as it is drafted. I have been involved with LSC since it was first proposed by Cornell Utilities engineers in 1994 as a way for the university to respond responsibly to the simultaneous needs to provide cooling without using CFCs while reducing energy use and the carbon and acid precipitation that accompanies it. I chaired a faculty committee of experts on limnology, fisheries biology, and hydrodynamics that raised the question of whether phosphorus redistribution in late summer would have an undesirable effect on phytoplankton growth. Although our committee concluded that the effect would be minimal, for the 18 years that I have been involved in interpreting LCS data, including a dozen years of post-LSC-start-up data, I have been interested in what the monitoring would actually show.

The results are now very clear: LSC is having no discernible effect on the functioning of the lake ecosystem, and it has won awards for its remarkably effective reduction in atmospheric pollution. LSC has not stimulated phytoplankton growth above that already present, nor is there any evidence that it has caused any other detrimental effect. While phosphorus in a form usable by phytoplankton (SRP) does enter the lake from the LSC outfall, the *concentration* of phosphorus is very similar to that already present in the lake surface waters. As a result it cannot cause an increase in lake total phosphorus concentration. Furthermore, because water residence time on the southern shelf is so low (on the order of a day or two), whatever the LSC-contributed P does to phytoplankton growth is vastly diluted as it is advected off of the shelf. Unusually careful and appropriate statistical analyses, both those mandated by DEC and others carried beyond the simple analysis, show beyond any reasonable level of "statistical doubt," that there is no pattern of change in phosphorus concentration or phytoplankton biomass that can be attributed to either the timing of LSC start up or to the location for the LSC outfall. Furthermore, dramatic reductions in P loading to the south end of the lake, as a result of improvements in the two wastewater treatment plants with outfalls, resulted in no reduction in water column P or phytoplankton. It is very clear that contributions of P to the southern shelf region of the lake do not control phytoplankton biomass. Rather this part of the lake is a part of a much larger system with water moved on and off the shelf by large lake flow patterns. Shutting off the LSC outfall would have absolutely no effect on water quality in the lake but would have dramatically negative effects on atmospheric inputs of pollutants.

What LSC-monitoring data *have* shown, however, is that both SRP and chlorophyll have increased in the lake beginning in 2005, a full 5 years after LSC started up. Similar increases have occurred in Seneca Lake. These increases have nothing to do with LSC because the timing of the increase is all wrong for that, and because it is regional (not only not just the south shelf region of Cayuga Lake, but not just Cayuga Lake). As a result, the TMDL study is exactly the right thing for DEC to be promoting. We need to find out what is causing the changes in lake water quality that we have observed, and as a result have the ability to infer how the lake will change in the future and what effective management will actually look like. A comprehensive TMDL study will provide the information needed. Such a study will provide the information

necessary to test, once again, whether P input from LSC's outfall is contributing to a reduction in water quality, so there is a reasonable rationale for the TMDL to be a significant component of the SPEDES permit, but the value of this study will likely go well beyond that direct motivation.

I am a faculty member at Cornell University, and the university pays my salary, but I hasten to point out that this relationship is a perfect example of why university faculty members have tenure. I am free to express my opinion on this topic without any fear of retribution from the administration. I cannot be fired, or even have my position altered, as a result of what I think about LSC. I live in the Cayuga Lake watershed, I swim and boat in the lake, and I deeply value this spectacular resource. The last thing I want is for the lake's environment to deteriorate, and I most especially would not want it to be negatively affected by the institution for which I work. My opinion, expressed above, is informed both by my 40 years of professional experience as a limnologist, and by my love of the upstate New York environment in which my family and I live. A TMDL as a part of the LSC SPDES permit is the right regulatory move at the right time.

Nelson G. Hairston, Jr.
6125 Perry City Rd
Trumansburg, NY 14886

From: "Hinkin, Tim" <trh2@cornell.edu>
To: "depprmt@gw.dec.state.ny.us" <depprmt@gw.dec.state.ny.us>
CC: "HEngman@town.ithaca.ny.us" <HEngman@town.ithaca.ny.us>, "RDePaolo@to...
Date: 11/26/2012 1:48 PM
Subject: Cornell and Lake Source Cooling

To whom it may concern,
I wrote the letter below to the DEC in May of 2009. To date Cornell University continues to deny any negative impact on the southern end of Cayuga Lake resulting from Lake Source Cooling. The problem continues to worsen and the algae bloom this August was the worst I have ever seen after living on the lake ¼ mile south of LSC for 11 years. The proposed study would cost far more than just extending the discharge pipe back to deep water, but the real crux of the issue is that Cornell cannot (will not) admit they are wrong. I applaud the Town of Ithaca Board for demanding that the situation be remedied and I expect that governmental agencies such as the DEC and EPA fulfill their responsibilities to protect a valuable public natural resources.

Timothy R. Hinkin
St. Laurent Professor in Applied Business Management and
Bradley Director of Graduate Studies
Cornell University School of Hotel Administration
540 Statler Hall
607-255-2938

My name is Tim Hinkin and I am a Professor of Management at the Cornell University School of Hotel Administration. My wife and I reside at 918 East Shore Drive in Ithaca, on Cayuga Lake just north of the Visitor's Center. We built our house in 2000, and since that time the weed and algae growth in the south end of the lake has increased dramatically and, in the past several years, exponentially. In August 2003 one of my best childhood friends brought his daughter to begin her studies at Cornell. At that time we went swimming off of our dock and there were very few weeds. Over the next several years they brought her back to school every August, and each year my friend would comment about the weeds getting thicker. The summer following their daughter's graduation in 2007 they visited us in August on their way back to Michigan after getting her settled in her apartment in New York City and the lake was so choked with weeds that we had to stop several times to clear off our boat propeller before we could get out to deeper water. Last summer was worse. My neighbors on the lake who used to visit us by boat no longer do so because of the weeds.

I have been following the many articles written about Lake Source Cooling in the Ithaca Journal and the Cornell Daily Sun over the past several years. Of particular interest was the article in the Ithaca Journal dated November 14, 2008. That article states that Cornell conducted a BACI study, presumably in 2003, as it was submitted in 2004. They found no effect, however, it appears that the study did not include site 7, which is within a couple hundred yards of our dock. It then reports that in 2007 the DEC ordered Cornell to include sites 4 and 7 in a follow-up study and Cornell resisted but you insisted, for which I am very thankful. It also states that Cornell's own consultants found the "7 and 4 impact," with site 7 having statistically significantly higher levels of soluble phosphorous. They then created "an alternative analysis" which appears to have aggregated the data to wash out any potential statistically significant effects. Finally the article states that the DEC had received Cornell's report in November but could not comment at the time and would respond within 4 to 6 weeks. That was over 5 months ago and we are still waiting. I understand that the DEC has many responsibilities and is under budgetary pressure, but this is an important issue for me as well as the whole Ithaca community.

If you visited Ithaca today you would notice today that the waves crash onto the shore at Stewart Park when the wind is out of the north, which it usually is. I have been watching the parachute boarders enjoy the whitecaps on the lake in front of my house the past few weeks and it reminded me that in a few months there will be no waves. If you visit the park in August or September you will see that no waves make it through the morass of weeds and algae even if the wind is blowing a gail--they effectively act like

a reef in the ocean to absorb the energy of the water. Not only that, but because the water cannot circulate it gets very warm which exacerbates the problem. The water temperature at the end of my dock reached the upper 80s for days on end last summer. It used to get into the upper 70s occasionally, but only for a day or so and then the water would get circulated.

Up until now it seems that those who have questioned Cornell about LCS have done so without a face of someone who has been personally affected by it. I am that person, and I am not alone as my neighbors are also extremely frustrated about the weeds and algae. Two of my neighbors have young children who are in the water constantly in the summer so pollution is a very real concern. We are looking for answers that will result in reversing the degradation of the southern end of Cayuga Lake.

As a member of the Cornell community for 17 years I am very disappointed both in the University's planning for LCS as well as the response to problems with it. As someone who is trained as a statistician, I see many problems with the Cornell study. First, the assumptions that were made about the effect of lake currents carrying any effluent north were flawed because of the prevailing wind out of the north which overpowers any current. Second, the initial BACI study did not include site 7, the most obvious area to be affected. This was not likely a mere oversight as research projects of this nature are very carefully designed. Third, Cornell vigorously resisted including site 7 in the follow-up study and it seems quite obvious why. Fourth, the interpretation of findings of the 2008 study was neither objective nor statistically sound. Nelson Hairston makes the argument about the pure chance affecting results of the study. This argument is flawed. The comments by Cliff Kraft, James Adams, and Todd Cowen about the conclusions of the study are misleading, at best. Fifth, it appears that the DEC is delayed in responding to the Cornell report, perhaps due to some pressure in constructing your response. Finally, and perhaps most unsettling, there is a real problem--which brings up serious issues of ethics and social responsibility. I understand that there are many alternative explanations for the increase in weeds. If site 7 is higher than the other sites, which I am confident will be the case, that will make any argument moot. Then Cornell will need to take responsible action. Please conduct your analyses in an objective manner that includes site 7. Those of us who live nearby are depending on it.

I am not a reactionary activist but rather an individual citizen who pays a significant amount of property taxes for the privilege of living on Cayuga Lake. When we built our home at the same time they were constructing LCS, there was no problem with weeds. We could get our boat in and out at any time of day or night without worrying about getting bogged down in a mass of weeds and algae. That is no longer the case. We live there so we can enjoy the water, but over the past several years the degradation of the water quality has motivated me to do something about it. If some action is not taken soon, the south end of the lake will not be navigable for much of the summer. I very much look forward to seeing your response to the Cornell report.

Tim Hinkin

HOBART
AND
WILLIAM SMITH
COLLEGES

Dr. John D. Halfman

Professor
Department of Geoscience
Chair, Environmental Studies Program

Finger Lakes Institute Endowed Chair
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December 16, 2012

Teresa Diehsner
NYSDEC
625 Broadway
Albany, NY 12233-1750

Comments on State Pollutant Discharge Elimination System (SPDES) Permit NY0244741

Ms. Diehsner:

I have been asked by Liz Moran of EcoLogic LLC to comment on the SPDES permit NY0233741 in which Cornell University proposes monitor the entire lake and selected streams to support a modeling effort to identify sources and impacts of phosphorus at the southern end of Cayuga Lake and eventually support DEC's development of a total maximum daily load (TMDL) for Cornell's Lake Source Cooling (LSC) facility. Cornell has also requested to abandon its monitoring effort of the lake after the adoption of a TMDL for the LSC facility. I am faculty member at Hobart and William Smith Colleges, and over the past two decades been involved in monitoring Seneca Lake and its watershed and more recently spearheading the Finger Lakes Institute's (FLIs) monitoring effort of the eight-easternmost Finger Lakes, Honeoye, Canandaigua, Keuka, Seneca, Cayuga, Owasco, Skaneateles, and Otisco, as well as nutrient and sediment loading issues in Seneca and Owasco Lakes.

First and foremost, the LSC facility is a significantly better environmental option than the coal-fired electrical chillers that it replaced in 2000. It significantly decreased Cornell University's carbon footprint, release of acid rain gases and CFCs to the atmosphere, and other airborne emissions due to the switch from burning coal to LSC. It will have a minimal impact on the thermal structure of the lake as well, no larger than any of the existing coal-fired power plants along the shores of the Finger Lakes. I mention this because it underscores the overall environmental impact of the facility, often overlooked by the local residents and other stakeholders. From this broader look, the LSC project is an environmentally sound plan! In my opinion, the advantages clearly outweigh the disadvantages to the environment.

However, the permit could use a few tweaks as I explain below because the southern end of Cayuga Lake is impaired. Various water quality parameters supported the impaired water quality (WQ) designation a decade or so ago. Locals are concerned and believe it also caused their perceived increase in the density and areal extent of macrophyte beds. It is easy for them to blame any one of the sources, and many folks blame the LSC project.

LSC monitoring data:

The original SPDES permit for the LSC facility dictated biweekly monitoring of the lake at a number of sites for various water quality parameters to assess the impact of the LSC phosphorus release to the shelf area. The results are published in annual reports and available online. Spatially, the data do not reveal an impact by the

LSC outfall, but instead perhaps the WWTP outfalls and tributary inputs overshadowed and impact by LSC. On the decade-scale, total phosphorus, soluble reactive phosphorus and chlorophyll-a concentrations increased in 2005 and again in 2011 (Figure 11, 2012 Report). Thus, the water quality is degrading, slightly, over time, and supports the concern raised by local stakeholders. Interestingly, the timing is concurrent with higher flows of the local tributaries (e.g., Fall Creek).

Impairment not LSC and WWTPs:

Cornell contends the degradation is not due to LSC because the timing of the water quality degradation is not congruent with the start of the LSC project (2000). The two municipal wastewater treatment facilities are also not to “blame” because they have recently reduced the phosphorus loadings from their facilities. The Ithaca area facility (IAWWTP) installed P-reduction upgrades in 2005, and Cayuga Height’s facility (CHWWTP) installed P-reduction upgrades in 2009, and the phosphorus loadings from the WWTPs decreased accordingly. I commend the plant operators for their efforts. Despite the significant reductions in WWTP phosphorus loadings, the WWTPs contribution to the overall P-loading problem in 2011 was still significant, 29% of the estimated total P-loading.

LSC releases recycled nutrients not new nutrients:

Cornell points out that LSC does not increase the amount of phosphorus discharged to the lake. The statement is true but misleading. The facility releases whatever is dissolved in the water drawn at the intake pipe in the hypolimnion and releases it to the epilimnion of the lake in the closed loop system. Cornell does not add or remove phosphorus or other dissolved/solid components, it only heats the water. However, the hypolimnion for most temperate lakes is typically enriched in soluble reactive phosphorus (SRP) compared to the epilimnion, especially near the end of the summer stratified season and maximum demand for chilled water from the LSC facility. The release of this SRP to the sunlit epilimnion enables algal growth (and macrophytes) and decreases water clarity because phosphorus is the limiting nutrient in Cayuga Lake, like most Finger Lakes. This issue is more problematic in Cayuga Lake because annual mean hypolimnetic SRP concentrations averaged 7 ppb in Cayuga Lake since 2005, much larger than the 1 to 2 ppb detected in the hypolimnion of the other lakes (Figure 1). The data also reveal changes from one year to the next, annual average hypolimnetic SRPs in Cayuga Lake range from 4 to 10 ppb. However, LSC impact is minimal and in my opinion not large enough to dictate Phosphorus scrubbing, outflow relocation or building a closed-loop system.

Origin and annual variability in the elevated SRP in hypolimnion:

I do not know why elevated SRP concentrations are detected in Cayuga Lake nor why the SRP concentrations varies from year to year but it would be nice to understand for an informed TDML. I have previously hypothesized that phosphorus attached to sediment particles or more tightly bound in calcium phosphates are transported to the hypolimnion from Taughannock and Salmon Creek runoff and the other inputs to the southern shelf area (LSC, MMTPs, and the various tributaries, e.g., Fall Creek and Cayuga Inlet). Sediment transport is consistent with persistent nepheloid layers at FLI’s Taughannock site, larger than the nepheloid layer at FLI’s more northern Cayuga Lake site and those, if any, detected in the other Finger Lakes (Figure 2). The bathymetry and aerial photography dictates that both Taughannock and Salmon Creeks discharge directly into the deep basin of the lake, probably as density currents, and presumably from the southern shelf as well. Bacteria release the phosphorus as SRP into the hypolimnion, and subsequent it is transported to the epilimnion by LSC and other mechanisms. Perhaps the proposed modeling effort can quantify this phenomenon. Nonetheless, the flux of phosphorus to the southern shelf due to LSC according to the annual LSC reports is less than 10% of the other southern shelf inputs.

Natural transport mechanisms of hypolimnetic water:

Wind stimulated seiche activity and internal waves can transport hypolimnetic water to the surface of the lake. It happens at the extreme northern and southern ends of the lake, as the thermocline oscillates up and down in response to the wind-event forcing, and other nearshore, localized, upwelling locations in response to water flow interacting with the lake’s bathymetry (just ask local fishermen where and when the fishing hotspots are located). This natural transport is not well known in most lakes, even Cayuga Lake, but most likely is

significant and in fact could dwarf the contributions from LSC and other sources. Someone at Cornell (Cohen or Walter?) just published a preliminary paper. In support of this claim, the recent reductions in WWTP loadings did not improve water quality in the southern end. Perhaps even the WWTP loads were dwarfed by the natural forcing. Hydrodynamic data, e.g., currents, winds, internal wave and seiche activity, would investigate this possibility.

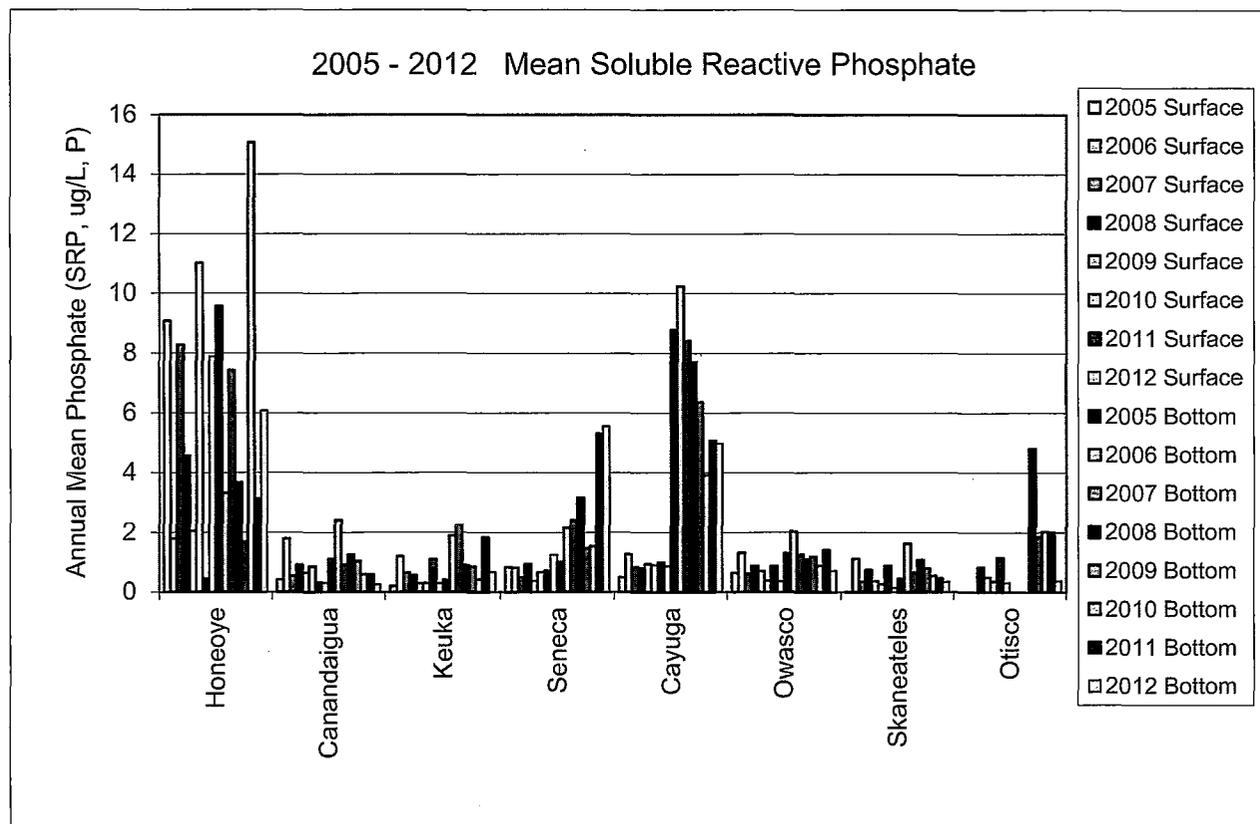


Fig. 1. Annual mean surface and bottom water SRP concentrations in the eight eastern Finger Lakes (FLI unpublished data). Honeoye is unique because it lacks a seasonal hypolimnion. Note that Cayuga Lake has untypically large hypolimnion SRP concentrations, and the mean concentration vary significantly from year to year.

The year to year trend in FLI's annual mean SRP data in Cayuga Lake is decreasing (for the most part). It suggests that the impact by the LSC system and natural fluxes to the southern shelf by internal waves and seiche activity should decrease as well. Did the decreased loading of new nutrients from the WWTPs have an impact? These trends are counter to the changes in water quality. Did a change in tributary flux have an impact? I note that tributary flow was higher than normal in 2004/2006 and again in 2011. It is worth additional study, a potential research project in Cornell's backyard.

Tributary fluxes require updating:

Cornell's reports suggest that tributary input provides the largest percentage of phosphorus to the southern end of the lake. Unfortunately, tributary fluxes over the past decade were not available in the annual LSC reports (not measured?). This is surprising because I believe Community Science and their volunteer monitoring program have some useful stream concentration and some stream discharge (perhaps from the USGS monitoring sites?) data. Cornell's reports however are based the tributary input on data collected in the late 1990's in support the initial SPDES permit application. This is unfortunate.

My studies clearly indicate that tributary input dominates the phosphorus budget of numerous Finger Lakes and more importantly the input varies significantly from one year to the next. Seneca Lake gains over 70% of the estimated annual P-loading to the lake from tributaries. A more detailed investigation in Owasco Lake

indicates that tributaries provide over 90% of the P-loading to the lake (WWTPs dump effluent into the tributaries). More importantly, the annual change in loads is huge. The 2012 mean annual suspended sediment and phosphorus fluxes of 2,400 and 1.9 kg/day, respectively, from Dutch Hollow Creek in the Owasco watershed was significantly smaller than those in 2011, 8,700 and 2.7 kg/day, respectively (Figure 3). The SRP loading in 2012, 0.4 kg/day, was much smaller than the loading in 2011, 1.7 kg/day (not shown). The difference, 2011 was a wet year, and 2012 was dry. Thus, climate induced variability in runoff of nonpoint sources may dictate the change in water quality at the southern shelf. Regardless, the data would be critical for the Cayuga Lake modeling efforts.

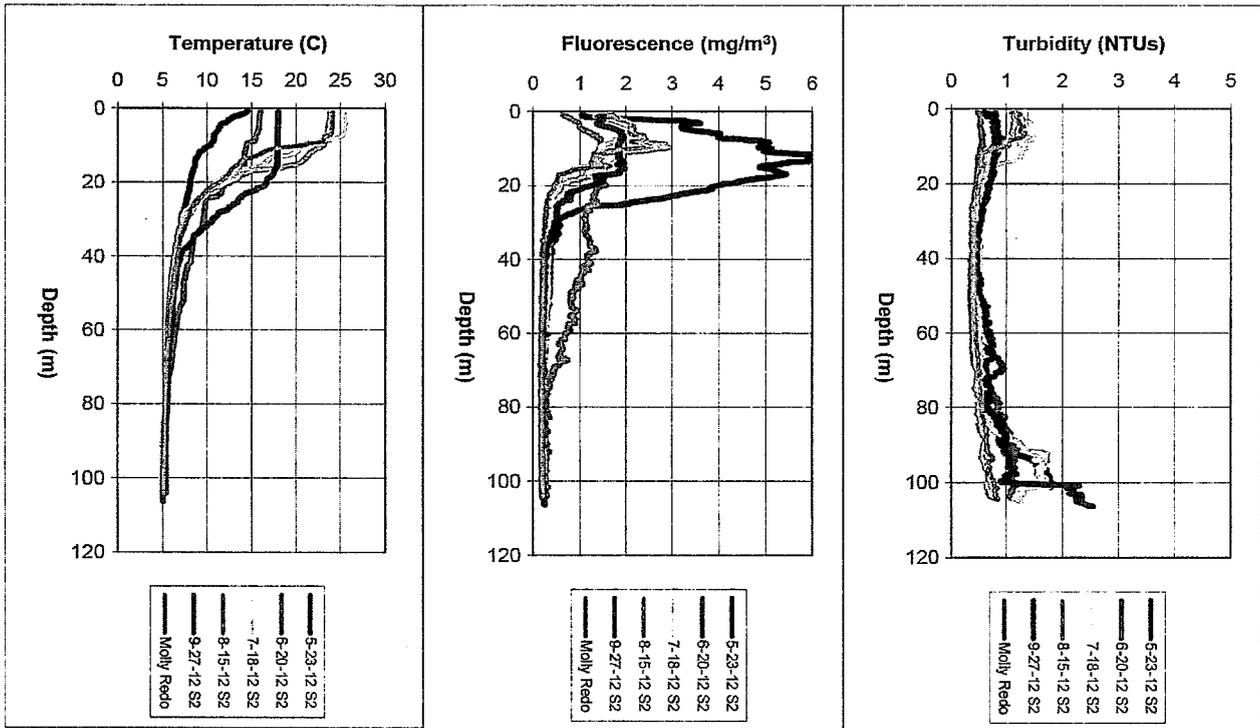


Fig. 2. 2012 temperature, chlorophyll and turbidity CTD profiles from the site offshore of Taughannock Creek (FLI unpublished data). The benthic nepheloid layers are more pronounced in "rainy" years.

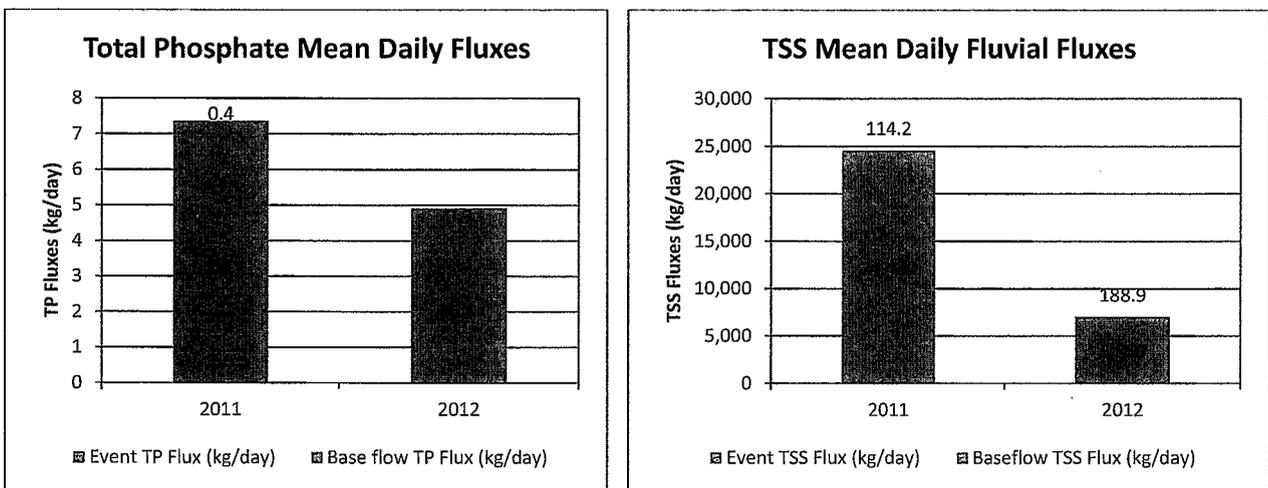


Fig. 3. Mean "event" and "base-flow" total phosphorus and total suspended sediment fluxes measured at Dutch Hollow Brook, an agriculturally-rich subwatershed in the Owasco Watershed (FLI unpublished data).

TDML focus?

I openly ask, will the TDMLs also “control” impacts by the MMTPs and tributaries? How about “control” of P-recycling by the cooling water systems in power plants like the AES Cayuga, a 300+MW coal-fired power plant along Cayuga’s eastern shore? Will any of these entities have a say in the process and development of their TDML limits? Will the proposed sampling scheme gather data useful to the application of TDMLs to all the other sources? I would be favor applying TDMLs to all P-sources, because only then will P-loading reductions be guaranteed across the board, and allow the initiation of a decade+ process to naturally clean up the lake. If TDMLs will be applied to everyone, I then advise that DEC hold stakeholder meetings, that include representatives from each source and other concerned groups, e.g., MMTPs, power plants, farmers, LSC, FLI, various towns and other municipalities, various watershed and other environmental-citizen-based groups, etc.).

Macrophytes (Eurasian Milfoil and others), Zebra and Quagga Mussels?

Cornell did not measure growth rates or densities of macrophyte beds, the impact by zebra or quagga mussels or any other organism (at least the data are not available in their reports). This is unfortunate. The phosphorus release by any of the sources, and especially the sediment laden phosphorus from tributary inputs, could promote the growth and spread of macrophytes. The zebra and quagga mussels are critical because they are known to increase water clarity in lakes, and did so for at least for a few years in Seneca Lake, and may be responsible for damping any increase in algal concentrations resulting from the phosphorus additions. I also did not see any evidence that surveys of the benthic community would be included in this permit application although it was mentioned in the public meeting on 12/13/12 that Cornell faculty would look at phytoplankton, zooplankton and zebra mussels. In fact, the details of what they will be measuring, when, what, where, and why, are missing in my read of the permit thus cannot be assessed. This too is unfortunate.

Continuation of the lake monitoring is critical:

Cornell has generated a powerful, decade-scale, limnological dataset for Cayuga Lake. It is also unfortunate that the permit revisions do not dictate continued data collection, even at a more limited scope, i.e., a less costly, two or three site, monthly, monitoring scheme. Decade-scale datasets like this one are lacking from most lakes throughout New York State and the entire country. Continued datasets like this one are useful to monitor water quality trends over time and investigate future threats to water quality in the lake. The data provides every stakeholder with solid scientific evidence to preempt individual bandwagons and unsupported ideas, and allow the community to focus attention on reducing all inputs for every source to improve water quality in the lake. It would also provide the scientific evidence to ensure if the proposed TMDLs works in the future. In my opinion, models are great in many situations but should always be backed up with solid evidence, especially as we enter the influence of an enhanced greenhouse world and more drastic excursions in weather patterns. Below in Figure 4 are long term secchi disk and SRP data from Seneca Lake that reveal a mid to late 1990’s increase in water clarity by the filter feeding zebra mussels, and a subsequent degradation in water quality by nutrient loading despite a healthy crop of quagga mussels (almost total replacement of zebra by quagga).

Finally, I am willing to volunteer as an independent, unbiased, “peer” reviewer of the data collection and modeling progress and the subsequent development of the TDMLs. Other Finger Lakes could benefit from a similar exercise **BEFORE** water quality in these lakes degrades beyond easy repair. I would also be willing to maintain a limited monitoring effort. If you need anything else, let me know.

Thanks,

John Halfman
Hobart & William Smith Colleges
Geneva, NY 14456
halfman@hws.edu

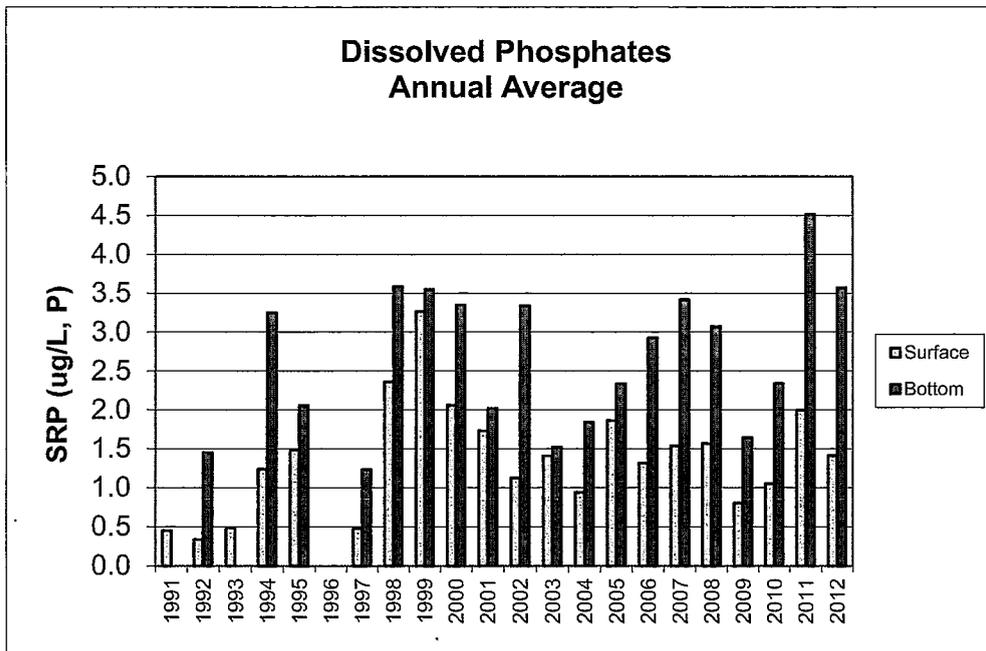
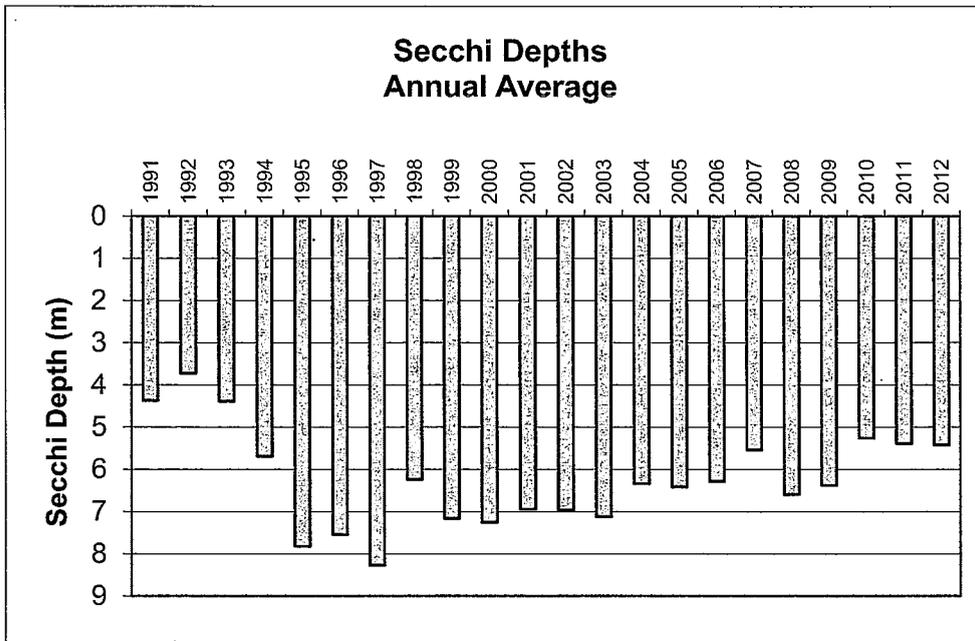


Fig. 4. Annual average secchi dish depths and soluble reactive phosphorus data from a weekly monitoring effort on Seneca Lake (FLI unpublished data).

From: ezra cornell <ezcornell@gmail.com>
To: <depprmt@gw.dec.state.ny.us>
Date: 1/1/2013 2:36 PM
Subject: Cornell University's Lake Source Cooling Facility at Cayuga Lake

I am writing in support of your providing a long term permit that enables Cornell University to continue to operate their Lake Source Cooling Facility.

As a long time resident, and as someone who has closely followed the development and implementation of Lake Source Cooling Facility, I am very proud that the State and University have enabled this facility and its technology to operate and provide sustainable cooling to the campus. This facility helps the environment and provides economic benefits to the University and the State (the State saves money on their support of education facilities at the Campus).

After many years of scientific study, there is no evidence of any harm done by the operation of the Facility. It is a simple heat exchange such that there is no mixing of water or introduction of new water, or any pollutants to the lake.

There are vocal people in this community that want to deny facts and spin interpretations to fit their agenda. They are wrong when they claim the Lake Source Cooling Facility harms Cayuga Lake.

This past year a vocal group, with participants that also oppose Lake Source Cooling, was pushing to restore a public swimming area along the shore of Stewart Park. Public swimming from the Southern shore line of the lake should not be associated with the subject of Lake Source Cooling. The intake and outtake pipes of Lake Source Cooling are much farther North of Stewart Park, and as you must know that the flow of water in the lake goes from South to North.

The concept of re-developing swimming in Stewart Park should be reviewed as a separate matter and denied. It should be denied because it would be unhealthy for the swimmers and because such a development would have incredibly high operating costs to tax payers of the City and State. Past experience when there was a swimming area in Stewart Park, showed it was an unhealthy and totally impracticable operation.

Thank you for adding this to your public comments about permitting Lake Source Cooling.

Ezra Cornell
212 Hanshaw Road
Ithaca, NY 14850

December 17, 2012

To: Department of Environmental Conservation
From: Clifford E. Kraft
Re: Cornell University's Lake Source Cooling Project SPDES Permit

I am providing comments in support of the SPDES permit for Cornell's Lake Source Cooling (LSC) facility as drafted (SPDES # NY0244741). I am a resident of Tompkins County and user of Cayuga Lake. Based on my training as a limnologist and fishery biologist, I have also been involved in discussions of the environmental impact of the LSC facility since shortly after I became a member of the Cornell faculty in 1998. Due to the timing of my move to the Ithaca area I therefore had no involvement in the project design or original permit application for the operation of this facility. However, I have regularly reviewed and commented upon the extensive data collected to evaluate the impact of the LSC facility upon Cayuga Lake.

I will focus my comments on elements of the proposed permit that will lead to watershed sampling and model development, as well as lake-wide sampling and development of a lake-wide water quality model. I support these activities because I recognize that current knowledge of factors influencing water quality at the southern end of Cayuga Lake are inadequate for understanding why the operation of the LSC facility has had no substantive impact on water quality in that area of the lake. Two important influences upon water quality at the southern end -- and throughout -- Cayuga Lake have been completely absent from any previous evaluation of the operation of the LSC facility or of factors influencing Cayuga Lake water quality, as follows:

- 1) Watershed contributions of phosphorus and sediments to the lake from tributary sources have never been estimated while the LSC facility has been in operation, even though it is widely recognized that these tributary sources are substantial.
- 2) The regeneration of phosphorus from dreissenid mussels ("quagga mussels") has never been estimated, despite a recognition that these invasive animals have extensively colonized the bottom of the lake during the period in which changes in hypolimnetic soluble reactive phosphorus have been observed -- and despite studies showing extensive nutrient regeneration by other dreissenid mussels^{1,2,3}

¹Arnott, D. L. & M.J. Vanni, 1996. Nitrogen and phosphorus recycling by the zebra mussel (*Dreissena polymorpha*) in the western basin of Lake Erie. *Can. J. Fish. Aquat. Sci.* 53: 646–659.

²Effler, S. W., S. R. Boone, C. A. Siegfried, L. Walrath & S. L. Ashby, 1997. Mobilization of ammonia and phosphorus by zebra mussels (*Dreissena polymorpha*) in the Seneca River, New York. Chapter 12, In Diltri, F. (ed.), *Proceedings of the Sixth International Zebra Mussel and Other Aquatic Nuisance Species Conference*, March 3–7, 1996. Ann Arbor Press, MI.

³James, W. F., J. W. Barko, & H. L. Eakin, 1997. Nutrient regeneration by the zebra mussel (*Dreissena polymorpha*). *J. Freshwat. Ecol.* 12: 209–216.

The development of a lake-wide water quality model as proposed in the draft SPDES permit will provide an opportunity to identify key influences upon Cayuga Lake water quality that at this point in time remain uncertain. Specifically, no one knows why hypolimnetic soluble reactive phosphorus increased lake-wide in 2005 and has remained fairly stable since then. Similarly, we do not know why recent substantial reductions in phosphorus inputs from sewage treatment plants at the southern end of Cayuga Lake had no discernible influence on water quality.

In my capacity as a faculty member, I train students in the use of scientific evidence -- rather than speculation -- in developing public policy to protect environmental resources. The watershed sampling, watershed model development, lake-wide sampling, and lake-wide water quality model proposed for development by the draft SPDES permit are necessary steps to develop relevant policies for protecting Cayuga Lake.

A handwritten signature in black ink, appearing to read "Clifford Kraft". The signature is fluid and cursive, with a long horizontal stroke extending to the right from the end of the name.

Clifford Kraft
983 W. Dryden Rd.
Freeville, NY 13068

¹Arnott, D. L. & M.J. Vanni, 1996. Nitrogen and phosphorus recycling by the zebra mussel (*Dreissena polymorpha*) in the western basin of Lake Erie. *Can. J. Fish. aquat. Sci.* 53: 646–659.

²Effler, S. W., S. R. Boone, C. A. Siegfried, L. Walrath & S. L. Ashby, 1997. Mobilization of ammonia and phosphorus by zebra mussels (*Dreissena polymorpha*) in the Seneca River, New York. Chapter 12, In Diltri, F. (ed.), *Proceedings of the Sixth International Zebra Mussel and Other Aquatic Nuisance Species Conference*, March 3–7, 1996. Ann Arbor Press, MI.

³James, W. F., J. W. Barko. & H. L. Eakin, 1997. Nutrient regeneration by the zebra mussel (*Dreissena polymorpha*). *J. Freshwat. Ecol.* 12: 209–216.

Richard P. DePaolo
126 Northview Road
Ithaca, NY 14850
607.275.9054

Teresa Diehsner
NYSDEC
625 Broadway
Albany, NY 12233-1750

December 19, 2012

Re: Comments on Lake Source Cooling (LSC) draft SPDES permit, # NY0244741.

Dear Ms. Diehsner,

I would like to start by reiterating the issues raised in the Town of Ithaca analysis and resolution on the draft permit, submitted in November. I would also like to supplement that record with the following comments.

Comment #1: NYSDEC and Cornell were aware of impairments in southern Cayuga Lake before the original SPDES permit was issued.

There has been some discussion that Cayuga Lake's designation as a "Category F" waterbody segment on the 1998 303(d) list somehow exempted it from provisions of the Clean Water Act at 122.4(i) which state "No permit may be issued to a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards."

Notwithstanding the fact that the applicable water quality standard in New York State is a narrative standard, and that designated uses had historically been impaired by algae and weed problems throughout the southern basin prior to 1998, the LSC Environmental Impact Statement (EIS) Table 2.3.3-14 shows that phosphorus values in the southern end of the lake were 30.8, 23.7 and 25.7 micrograms per liter for the years 1994, 1995 and 1996, respectively, above the guidance value of 20 micrograms per liter commonly used to indicate borderline eutrophic status. The data predate the issuance of the permit by as much as 4 years.

Comment #2: Soluble Reactive Phosphorus can contribute significantly to the growth of rooted macrophytes under certain conditions. Cayuga Lake sediments have not been evaluated to support Cornell's claim that its cooling facility does not contribute to use impairments caused by excessive weed growth.

Research on the nutrient pathways of rooted macrophytes in phosphorus limited waterbodies indicates that the preferred mechanism of phosphorus absorption is determined by concentrations of bio-available phosphorus in the water column vs. the interstitial water and can vary widely from one location to another. Until a comprehensive widespread sediment profile is completed, there is no way to exclude LSC as a factor in the proliferation of rooted macrophytes.

Comment #3: Phosphorus effluent limitations in the draft permit do not follow the guidance in TOGS 1.3.6.

Anti-backsliding provisions in the NYSDEC Technical Operational Guidance Series 1.3.6 call for evaluating the historical contribution of phosphorus to a ponded waterbody and creating an effluent limitation that does not allow for the discharge to increase over historical values:

2. Any proposed expansion of an existing discharge within a lake watershed, which would require a modification of an existing SPDES permit, should provide BTT for phosphorus removal to a degree that the annual quantity (mass loading, flow multiplied by concentration) of phosphorus discharged after the modification does not exceed the phosphorus discharged prior to the modification. An expansion is defined, for purposes of this TOGS, to be an increase in the effluent flow of the system.

The interim limit of 6.4 lbs/day and the proposed final limit 4.8 lbs/day constitute significant increases over historical average discharge levels. The fact that there has been no effluent limitation for phosphorus in the LSC permit is immaterial. The only thing that matters according to the language above is the amount of phosphorus historically discharged vs. the amount permitted to be discharged in the future, on an annual mass loading basis. According to TOGS 1.3.6, increased flow equals expansion. LSC will be allowed to continue to increase its flow over historic levels as cooling demand on campus increases, and, therefore, is an expansion.

As a matter of public record, Robert Bland, representing Cornell University at the November 14th 2012 meeting of the Special Joint Committee of the Ithaca Area Wastewater Treatment Facility, stated that, as proposed, the permit would allow an expansion over historical values. The audio recording of the meeting is available for review upon request.

At a minimum, NYSDEC should propose effluent limitations that are in concert with historical averages and prevent LSC from increasing its phosphorus contribution to the south shelf.

Comment #4: Cornell employees and consultants have inherent conflicts of interest and conscience and should not be allowed disproportionate roles in studies that will determine the fate of Cornell's discharge and the financial interests of other stakeholders potentially impacted by TMDL development.

Columbia University research guidelines define "conflict of conscience" as follows: *"A conflict of conscience occurs when personal beliefs influence objectivity in research."*

Cornell professors, employees and consultants identified as lead scientists in the Cayuga Lake Modeling Project, a condition of the draft SPDES permit, have inherent conflicts of interest and have demonstrated conflicts of conscience. Due to the longstanding financial relationships between Cornell and its employees and consultants, and the public positions in defense of Lake Source Cooling taken by some of these scientists prior to the proposed modeling study, NYSDEC should facilitate a public process that leads to the selection of independent non-conflicted researchers. Individuals closely associated with Lake Source Cooling now slated to conduct the data gathering and modeling upon which a TMDL would be based include:

Nelson Hairston: Cornell Professor Nelson Hairston has been an 18-year proponent of Lake Source Cooling, having served on the University's technical review committee during its development. He has been tapped to lead the research regarding phytoplankton during the modeling study.

During recent comments to NYSDEC on the draft LSC permit, Mr. Hairston opined, "*The results are now very clear: LSC is having no discernible effect on the functioning of the lake ecosystem...*," adding, "*Unusually careful and appropriate statistical analyses, both those mandated by DEC and others carried beyond the simple analysis, show beyond any reasonable level of "statistical doubt," that there is no pattern of change in phosphorus concentration or phytoplankton biomass that can be attributed to either the timing of LSC start up or to the location for the LSC outfall.*"

Subsequent to those comments, Mr. Hairston dubiously goes on to imply that the Cayuga Lake Modeling Project will, "*...provide the information necessary to test, once again, whether P input from LSC's outfall is contributing to a reduction in water quality, so there is a reasonable rationale for the TMDL to be a significant component of the SPEDES permit...*"

But, how are we to believe that Mr. Hairston can meaningfully and objectively participate in a modeling study of Cayuga Lake, including another "test" of the LSC discharge, after having stated unequivocally in advance, and in contradiction of NYSDEC's own analysis, that LSC has not had an impact? Surely, there are unaffiliated scientists with expertise in phytoplankton who have not evidenced a predisposition toward the LSC discharge.

Todd Cowen: Cornell Professor Todd Cowen has been involved with the Lake Source Cooling team since 1999 and has authored its annual monitoring reports since 2007. He has been identified as the individual who would lead the research into hydrodynamic processes in Cayuga Lake, including the "outfall relocation study" required by the draft LSC permit and triggered by NYSDEC's finding of a "possible/probable" link between an increase in trophic indicators and Lake Source Cooling. The outfall relocation study is critical in determining the extent to which the phosphorus and thermal impacts of LSC would be mitigated by returning the discharge to a depth below the thermocline.

In a recent opinion piece published in the Ithaca Journal, Mr. Cowen exclaimed, "*I know the science and I know the data. LSC has had no detectable impact on Cayuga Lake, as shown by both the BACI analysis and the alternative analysis.*" Regarding changes in trophic indicators since the startup of LSC, he proffered, "*Powerful data analyses show that LSC is not the cause of these changes in Cayuga Lake...*," going on to add that, "*The proposed lake-wide modeling and subsequent total maximum daily loading process will provide an opportunity for lake managers to move beyond LSC as the phantom culprit...*"

Despite his publicly stated position regarding Lake Source Cooling, Mr. Cowen is now being put in charge of a study that will directly determine the outfall design of Lake Source Cooling. He has clearly evidenced his conflict of conscience and cannot credibly participate in a study that includes a direct analysis of his employer's "phantom culprit."

Elizabeth Moran: Dr. Moran, President of environmental consulting firm EcoLogic, LLC, led the scientific review of Lake Source Cooling during the creation of its EIS, while employed by Sterns & Wheler. Her involvement with LSC dates back to 1994. She was recently retained by Cornell to facilitate public involvement during the study period, and to disseminate information on behalf of the University, having stated that her job is to "clear up a lot of misperceptions out there."

Dr. Moran reportedly led the field research allegedly proving that low-intensity light would be effective at deterring *Mysis relicta* from the LSC intake structure. Several years later, after the mitigation system was destroyed, the University backed away from her conclusions in its effort to avoid having to redeploy and maintain the system. Either Dr. Moran was wrong, or the University is subsequently wrong (and disingenuous) about the effectiveness of the light mitigation system.

Of equal concern is Dr. Moran's effort to prevent a TMDL for phosphorus from being developed for southern Cayuga Lake. In a lengthy 2002 letter commenting on the then draft 303(d) list, Dr. Moran stated, "... investment of limited public resources in developing a TMDL for phosphorus will not alter the extent of impairment of southern Cayuga Lake. I believe that it is the responsibility of NYSDEC staff to review these extensive data and reevaluate the draft listing of Cayuga Lake on the 303(d) list accordingly."

Dr. Moran based her conclusion that "southern Cayuga Lake does not exceed the NYSDEC guidance value for phosphorus in lakes" on a NYSDEC table listing mean epilimnetic total phosphorus values of the Finger Lakes from 1996 to 1999. Inexplicably, she did not utilize ambient water quality data gathered in connection with the Lake Source Cooling monitoring program for the three years most recent to her letter, which would have revealed a mean total phosphorus value in southern Cayuga Lake of 21.5 micrograms per liter, above the NYSDEC guidance value of 20 generally used to indicate excessive phosphorus.

Dr. Moran's pre-determination of the impropriety of southern Cayuga Lake's regulatory classification and the ineffectiveness of subsequent pollution controls does not bode well for her role as liaison to the public. Certainly, Cornell is entitled to hire whomever it wishes to deliver its propaganda. However, her long history as a paid consultant for Cornell calls her objectivity into question.

Upstate Freshwater Institute: Upstate Freshwater Institute (UFI) has been Cornell's monitoring consultant since 1998, and has reportedly received hundreds of thousands of dollars from Cornell for its field work and reporting. UFI is coordinating the Cayuga Lake Modeling Project.

Annual reports on LSC issued by UFI from 2000 through 2006 all conclude with the following statement: "*No conspicuous changes in water quality have been observed on the shelf since start-up of the LSC facility in July 2000.*"

Subsequent reports documented changes in key trophic indicators, yet arrived at the same conclusion:

"No conspicuous changes in water quality have been observed on the shelf since start-up of the LSC facility in July 2000. The observed increases in soluble reactive phosphorus concentrations at the LSC intake since 2003 and the increase in summer average chlorophyll concentration in 2006 appear to be the result of lake-wide phenomena."

"No conspicuous changes in water quality have been observed on the shelf since start-up of the LSC facility in July 2000. While the 2006 report noted an apparent increase in lake-wide Chlorophyll-a concentrations this now appears to correlate with the unusually high tributary flows of that year."

"It is possible that the higher levels of Chlorophyll-a are related to the increase in phosphorus in the lake's hypolimnion observed since 2004 - 2005. No conspicuous changes in water quality have been observed on the shelf since start-up of the LSC facility in July 2000."

"The cause of higher phosphorus concentrations at the LSC intake has not been established. The correlation of dates on which higher levels of phosphorus have been measured on the shelf with dates on which there were either elevated tributary flows, upwelling events or temporarily increased loading from the two WWTPs indicates that these are the dominant factors in determining the water quality on the shelf. No conspicuous changes in water quality have been observed on the shelf since start-up of the LSC facility in July 2000."

"...both TP and SRP concentrations at the LSC intake were higher in 2011 than in any previous year. The cause of higher phosphorus concentrations at the LSC intake has not been established. The correlation of dates on which higher levels of phosphorus have been measured on the shelf with dates on which there were either elevated tributary flows, upwelling events or temporarily increased loading from the two WWTPs indicates that these are the dominant factors in determining the water quality on the shelf. No conspicuous changes in water quality have been observed on the shelf since start-up of the LSC facility in July 2000."

The fluidity of the many cause and effect theories offered by UFI and Mr. Cowen throughout the years would be entertaining were it not for the obvious omission of any consideration whatsoever of Lake Source Cooling as a potential factor. It's the tributaries, it's the wastewater plants, it's "upwelling events," it's unusually wet years, it's zebra and quagga mussels, it's everything under the sun, except Lake Source Cooling. In reality, one can see by reading the above excerpts in chronological order that the authors were no closer in 2011 than they were in 2006 to explaining the changes in southern Cayuga Lake. Yet, these individuals are now in charge of analyses that will lead to a TMDL? That is unacceptable.

The BACI Analysis

UFI conducted a Before After Control Impact analysis to determine LSC-related impacts on the south shelf of the lake. In order to explain post-startup increases in Chlorophyll-a at LSC "bracket" Site 7 measured against control Site 4, authors concluded, *"Because of the relatively small contributions of the LSC discharge to TP loading on the southern shelf (< 10%), it is unlikely that LSC was the direct cause of these increases."*

UFI researcher Dave Matthews led Cornell's effort to refute the decision of NYSDEC to include an analysis of Site 7 with Site 4 claiming that it amounted to "changing the rules."

Upstate Freshwater Institute has made a small fortune monitoring and defending Lake Source Cooling. It strains credibility that UFI would be allowed to assume the lead scientific role in coordinating a study that will have a direct bearing on the discharge of one of its major clients.

Conclusion:

The development of a TMDL for southern Cayuga Lake is long overdue and must examine the many synergistic forces impacting southern Cayuga Lake. However, the study proposed in the draft permit, if dominated by Cornell, will yield a tainted result. NYSDEC should not expect meaningful public buy-in to a study and TMDL process that has been commandeered by a major stakeholder. The mere fact that NYSDEC has limited resources is not a good enough reason to ignore the obvious conflicts of interest and conscience in this case.

NYSDEC should propose meaningful effluent limitations for phosphorus in the spirit of TOGS 1.3.6 and reopen the permit process to include all stakeholders in the development of a modeling plan that will lead to pollution controls that are above reproach.

From: <hesken@zoom-dsl.com>
To: <deprmt@gw.dec.state.ny.us>
Date: 12/17/2012 10:25 AM
Subject: Comment on Permit NY0244741

My wife and I have summered on Cayuga since 1956 and lived year around since 1999 selling our place in June of this year. Our cottage was on the west shore (1501 Taughannock Blvd.) about and two miles south of Taughannock Park and right across from Meyers point. I have watched the lake slowly decline over these years accelerating in this decline over the past 5 years. While I am sure that there are factors other than Lake source cooling, there is no question that it has contributed to greater weed growth in our area and poorer fishing especially in the south end in the early spring. But beyond that I wonder why Cornell has been allowed to use the lake for it's commercial purpose without paying anything, yet saving thousands of dollars not having to cool the water for A/C. Of course Cornell has taken the position that in so doing they are saving the environment from other pollution caused by generating A/C. I believe that the lake should not be used for commercial purposes, and that lake source cooling should be stopped immediately. But failing that, Cornell should not only fund the study the DEC has requested but pay to the State an annual fee for their commercial use of Cayuga Lake. Kenneth N. Welch, 1003 Honey Bee Lane, Trumansburg, N.Y. 14886

From: Steve Beyers <smb75@cornell.edu>
To: "depprmt@gw.dec.state.ny.us" <depprmt@gw.dec.state.ny.us>
Date: 12/5/2012 1:16 PM
Subject: Comment on Permit NY0244741

I am writing this letter as a concerned citizen in regards to your recent Draft Permit for LSC (Permit NY 0244741).

It is extremely disheartening that the Department is requiring extensive and costly permit conditions which threaten the future effectiveness of Lake Source Cooling without fairly considering the environmental merits of this system. The proposed final permit limits, which would curtail LSC when it is needed most, are misguided and damaging to the environment.

The NYSDEC website (<http://www.dec.ny.gov/regulations/65034.html>) describes a NYSDEC policy that requires any new regulatory decision to determine whether it will lead to "an increase or decrease of GHG emissions, and whether an expected increase in GHG emissions can be feasibly mitigated". For Lake Source, this analysis is exceptionally simple: anytime Lake Source Cooling is curtailed, thousands of pounds of additional CO2 emissions will result.

Well-meaning but irrational regulatory policies or decisions appear to imagine a pristine southern basin that nature never intended (with or without LSC). Regardless of intent, the proposed regulatory "fixes" have no clear benefit to the environment or the community. Extending the outfall would only waste money, disrupt the lake bed, and require more pumping energy forever, thereby effecting more fossil-fuel emissions elsewhere. Permit limitations in the southern shelf on P may be well-intentioned, but would only reduce summer flow, increase the stagnancy of the southern basin, reduce the dilution of dissolved and suspended solids, and increase air emissions by requiring more refrigerant-driven chillers (contributing to ozone reduction) to compensate, all for no known environmental benefit. A closed-loop system, even if practicable, may have the unintended consequence of disrupting the thermal layering in the lake; in any event it would also increase pumping demands of the system, thereby adding inefficiency and CO2 year after year.

The NYSDEC should follow its own guidance and take a broad view of the environment. Stepping back will make things crystal-clear. The marvelously simple technology of LSC with its outstanding efficiency and benign impact is something to support and praise, not burden with crippling regulation. Furthermore, any future regulation of phosphorus must also weigh the positive impacts of LSC on southern-shelf turbidity and global climate change. Common sense and honest environmental stewardship require this broad and fair-minded approach.

Steve Beyers, P.E.
1328 Slaterville Road, Ithaca NY

Department of Environmental Conservation (DEC)

Re: Cornell University Lake Source Cooling SPDES Permit

I am first and foremost a citizen in the Cayuga Lake Watershed. My family and I are all frequent users of Cayuga Lake and have been for years. We own a small sailboat and three kayaks. We regularly swim in the southern basin of Cayuga Lake from these boats and the East Shore Park. Both of my children row competitively on the lake out of the Cascadilla Boat Club based at the mouth of Fall Creek in Stewart Park. We've chosen to swim in the lake's southern basin in and around the LSC outfall plume because the water is pristine and ensures that we are not swimming in the chlorinated waters of the two major point discharges: The Ithaca Area Waste Water Treatment Facility (IAWWTF) and the Cayuga Heights Waste Water Treatment Plant (CHWWTP), both of which do superb jobs of treating waste water. But why swim in a treated anthropogenic plume when we can swim in deep Cayuga Lake "spa quality" water?

I know more than a little bit about Lake Source Cooling (LSC). In my day job I'm a tenured faculty member in the School of Civil and Environmental Engineering at Cornell University working in the area of environmental fluid mechanics. I have held leadership positions in the Atkinson Center for a Sustainable Future from its inception and believe strongly in mitigating our anthropogenic footprint on this planet. LSC has reduced the carbon footprint (along with sulfur and other pollutants) by more than 80% relative to the coal-fired, electric-powered chillers it replaced; it is a tremendous project. I volunteered to be a member of the Technical Advisory Committee on LSC in 1999. Since then, I have reviewed every LSC annual report, been involved in the Before After Control Impact (BACI) analysis that was submitted to the DEC and reviewed the more powerful "Ellner" alternative analysis that was also submitted to the DEC. My research group has collected the bi-weekly water samples used in the LSC monitoring program and written the LSC annual reports since 2007. I know the science and I know the data. LSC has had no detectable impact on Cayuga Lake, as shown by both the BACI analysis and the "Ellner" alternative analysis.

There has been a change in Cayuga Lake - mean summer (July through August) algal concentrations (as measured by chlorophyll-a) in the lake rose 60%, from 5.2 $\mu\text{g/L}$ during 2000 to 2005 to 8.5 $\mu\text{g/L}$ during 2006 to 2011. This was preceded by one to two years by an increase in total phosphorus (TP) concentration in the lake's hypolimnion. Mean TP went from 12.3 $\mu\text{g/L}$ during 2000 to 2003 to 15.6 $\mu\text{g/L}$ during 2004-2009 while mean soluble reactive phosphorus (SRP), the form of the nutrient used by algae, increased nearly 80% over the same period, going from 4.8 $\mu\text{g/L}$ to 8.6 $\mu\text{g/L}$. Similar trends have been observed in Seneca Lake.

Powerful data analyses show that LSC is not the cause of these changes in Cayuga Lake, which occurred 4-plus years after LSC startup, against a backdrop of the IAWWTF and the CHWWTP lowering their phosphorus inputs significantly, by many

times more than the amount of phosphorus being recirculated by LSC. That is to say the treatment plants reduced their phosphorus inputs by several LSC's, yet, despite this, we have observed the above noted lake-wide increases. This demonstrates clearly that phosphorus from the point sources is not the cause of the lake-wide increased phosphorus and chlorophyll levels. Further, chlorophyll-a concentrations are often higher in the main lake as compared to water in the southern basin, which is also contrary to the existence of a point source of nutrients leading to algal growth on the lake's southern shelf, but is consistent with the findings of Effler et al. (2010), which shows that the residence time on the southern shelf has a typical value of about 2 days.

What is really happening in the Cayuga Lake? Should we be concerned? We don't know. The proposed lake-wide modeling and subsequent total maximum daily loading (TMDL) process will provide lake managers an opportunity to move beyond LSC as the phantom culprit and let science determine what is the cause of the SRP increase in the hypolimnion and subsequent chlorophyll-a increase lake-wide. I have hypotheses that I am exploring but I am eager to let science tell us what is happening and have my hypotheses confirmed, disproved or perhaps modified. The developed modeling tools proposed under the SPDES permit will allow scientists to determine what the effects of point and non-point sources are in the overall Cayuga Lake phosphorus budget and will reveal if some source or some biogeochemical process – which is perhaps converting TP to SRP – is missing from our current understanding.

In my 10-plus years of reviewing LSC data, this is the first time that I am truly optimistic that Cornell expenditures will actually contribute to science that will improve the water quality of the lake that we cherish. As a citizen in the watershed who uses the lake recreationally with my family, this is exciting. I strongly encourage you to move forward with the SPDES permit as written.

Sincerely,

A handwritten signature in black ink, appearing to read "Edwin A. Cowen". The signature is fluid and cursive, with a large initial "E" and a stylized "C".

Edwin A. Cowen
119 Oak Hill Rd
Ithaca, NY 14850

Citation:

Effler, S.W.; Prestigiacomo, A.R.; Matthews, D.A., Gelda, R.K.; Peng, F.; Cowen, E.A.; Schweitzer, S.A. (2010). Tripton, trophic state metrics, and near-shore versus pelagic zone responses to external loads in Cayuga Lake, New York, U.S.A. *Fundam. Appl. Limnol., Arch. Hydrobiol.* **178**(1), 1-15,

From: Gary Stewart <gary.stewart@cornell.edu>
To: "deprmt@gw.dec.state.ny.us" <deprmt@gw.dec.state.ny.us>
Date: 12/2/2012 3:31 PM
Subject: Comment on Permit NY0244741

To the DEC:

As a native of the Finger Lakes, I am glad that science-based collaborations will be the focus of a Cayuga Lake study, rather than anecdotes, soundbites, and the occasional self-promotion.

I would encourage the DEC to listen to the local watershed professionals who have repeatedly said that Lake Source Cooling does not contribute to impairment issues in the southern end of Cayuga Lake, (see representative March 4 2010 letter from the Tompkins County Water Resources Council to DEC Region 7's Lynch and Peachy, and Water Division's Klotz), and to talk with local experts about the history and characteristics of the southern basin.

Folks who grew up in Ithaca, going way back, say there was wading in muck off the southern shore once upon a time - not real swimming - until the 1960s, when the dangers of turbidity and other hazards became increasingly obvious, and going in the water off of Stewart Park was prohibited. All of this took place, of course, decades before the concept of Lake Source Cooling was proposed.

There is a great opportunity at hand to get some real answers on a complex eco-system. It has been embarrassing how this multi-layered issue has too often been dumbed down in a town where education is cherished.

I support the spirit of collaboration found in the draft permit, and believe a water modeling study will reap benefits for everyone who cares about Cayuga Lake.

Gary Stewart
110 Tudor Road
Ithaca NY 14850

From: Sarah Zemanick <sarahzemanick@verizon.net>
To: <deprmt@gw.dec.state.ny.us>
Date: 12/2/2012 11:33 AM
Subject: Comments on the Cornell Lake Source Cooling SPDES Permit Renewal, NY 024 4741

Dear Ms. Diehsner:

I am writing to state my support for the draft permit renewal for Cornell's Lake Source Cooling facility. LSC is a capstone of Cornell's commitment to green infrastructure, and is recognized internationally for its innovative approach to reducing electricity consumption. Since the project came on-line in 2000, the electricity use for cooling has decreased by 87%, even as campus facilities have expanded. This tremendous reduction in Cornell's carbon footprint from using less fossil fuel also achieves significant environmental benefits associated with reduced extraction and transport.

NYSDEC awarded the project its Governors Award for Pollution Prevention.

Cornell has conducted an extensive in-lake monitoring program annually since 1998. Results have been subjected to rigorous statistical evaluations and independent reviews. There is no credible evidence that the facility has had any adverse impact on Cayuga Lake.

The permit condition requiring a mathematical model of Cayuga Lake and its watershed will enhance our collective understanding of the lake. This effort is an opportunity to recognize the interactions between sustainable development and lake health. People are part of the ecosystem, and the ways we manage development, the working landscape of farms and vineyards, and our infrastructure--including water, wastewater, and cooling water--have the potential to affect the lake, for better or worse. Investing in the water testing and modeling necessary to assess the overall environmental impact of the LSC facility will improve the scientific basis for regulatory decision making.

I look forward to the public outreach process, and trust that it will bring the community together to discuss important issues, including the Cayuga Lake ecosystem, climate change and invasive species.

Sarah Zemanick

680 Stevens Road
Groton, New York 13073

p.s.

It is interesting to note that despite the IAWWTP phosphorus reduction project, the conditions in the southern end of the lake do not seem to have changed. Does this indicate that p is not the limiting nutrient? Certainly it seems to indicate that a solution is not as simple as limiting the LSC phosphorus.

--

Campaign (3047): Comments on the Cornell Lake Source Cooling SPDES Permit Renewal, NY 024 4741

Learn more about this campaign here:

<http://www.citizenspeak.org/campaign/cayuga-lake-modeling-project/comments-cornell-lake-source-cooling-spdes-permit-renewal-ny-0>

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This campaign was created with CitizenSpeak. Visit us online at <http://citizenspeak.org>

From: Manley Thaler <mht13@earthlink.net>
To: <deprmt@gw.dec.state.ny.us>
Date: 11/25/2012 7:22 AM
Subject: Cornell--Cayuga Lake Discharge

A panel of Independent -Non Associated--experts should be appointed to study the application and present situation and file a public report with the Department and with the appropriate federal agency since the Lake is a part of the federal water system.. Manley H. Thaler,ESQ

From: <JLi2533838@aol.com>
To: <depprmt@gw.dec.state.ny.us>
Date: 10/25/2012 4:29 PM
Subject: (no subject)

[_http://binghamton.ynn.com/content/all_news/tompkinscortland/607097/study-to-search-out-sources-of-lake-contaminant/](http://binghamton.ynn.com/content/all_news/tompkinscortland/607097/study-to-search-out-sources-of-lake-contaminant/)
(http://binghamton.ynn.com/content/all_news/tompkinscortland/607097/study-to-search-out-sources-of-lake-contaminant/)

My comment. Would it help to run a pipe to discharge the used cooling water from Cornell to a deeper part of the Lake so there is less warming in the South part of the Lake where it is shallow? This would at least reduce the algae which the phosphorous causes.

Regarding the quote in the news report: "Wastewater runoff, agricultural activity and development"

My other comment/concern: Is it possible that some businesses and agricultural runoff are discharging phosphorous into storm sewers? Is it also possible that some storm Sewers are discharging into the city of Ithaca sewer system? (That's what happened in our Town) It leads to flooding too. I know I live out of Town but consider myself a stakeholder because I visit the area as a tourist (boating and fishing) in Cayuga Lake.

James Little 607-644-8513
522 Winston Drive
Endwell NY 13760

From: <GPatte@lgtlegal.com>
To: <deprmt@gw.dec.state.ny.us>
Date: 11/15/2012 9:46 AM
Subject: NYS DEC

NYS DEC
ATTENTION: Teresa Dielsner

MS. Dielsner,

I write to express real concern about Cornell's permit. The phosphorous limits I understand have been established (interim load at 6.4 lb./day) seem alarmingly high and should not be approved.

As I understand it, the water drawn from the intake at a deep water point has high levels of phosphorous and when it is discharged at the shallow southern end it increases phosphorous levels. That increase since 2000 is alarming and must be controlled. Cornell and some local officials (including some officials responsible for water study at the county level and city level) say it could not be from LSC, and yet DEC is allowing Cornell to conduct the 2 year study now to measure phosphorous and other things in the lake. There should be an independent study done by a qualified agency with no connection to Cornell or others.

I have lived on the lake (roughly opposite the intake) for 36 years and have noticed over the last 10 years an increase in weed growth in front of my residence, and it seems to be increasing over that period to a degree that is making swimming and other activity dangerous and annoying. I have studied the issue (I am former chair of the Fall Creek Watershed Committee) and the evidence to date points to Cornell's LSC as the main culprit. There is no other source of phosphorous into the lake during this time that has increased phosphorous; the City of Ithaca waste water plant and other possible sources, including farm run-off, have to my knowledge all decreased phosphorous discharge in this same time period.

At the same time, DEC has to my knowledge done no study of LSC's effect on migratory fish like salmon and trout species. That run has been off drastically over the last 10 years, more so in the last 5 to 7. Is the warm water discharge in the shallow south end where they must pass affecting their run? Why are they not in the streams as they used to be, such as Fall Creek and Six Mile Creek? Are there other factors affecting the runs? None of this has been addressed and if the lake is being studied it should be a part of this review now, and should be at the expense of Cornell--but not conducted by Cornell. Fish and Wildlife and other experts should bring to bear their expertise on this issue. Is there study elsewhere in the world for the effects of such a discharge? At the very least, should not Cornell be ordered to substantially lessen its discharge and, if it is safe, do so at a point in the lake where it is much deeper?

The interim limit of 6.4 is not justified or reasonable as it is set forth on the Fact Sheet. It should not stand, and some substantially less discharge limit should be established independently. Even in the year 2000, in a study available on line, an independent expert retained by Cornell said he was not sure if the phosphorous discharge was legal as Cornell proposed back then--and I submit it is likely that the discharge

has never met standards established for this body of water in the Clean Water Act or other controlling law or regulation. This should not continue. I agree in large part with the Town of Ithaca's recent resolution opposing your proposals on LSC and the permit process.

The public's stake in Cayuga Lake is more important than Cornell's. DEC is entrusted with the over-all health and welfare of this lake, but it is not living up to that trust.

George D. Patte, Jr.
1167 Taughannock Blvd.
Ithaca, NY 14850
Tel: (607) 272-3484
Fax: (607) 277-2112
<http://www.binghamtonlaw.com>

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From: "Carol Farkas" <cfarkas@twcny.rr.com>
To: <dowinfo@gw.dec.state.ny.us>
Date: 11/15/2012 9:47 AM
Subject: Cornell Lake Source Cooling Project

I strongly oppose Cornell University's being directly involved in a future study of the relationship between the Lake Source Cooling Project and increased phosphorus levels in Cayuga Lake. The conflict of interest should be readily obvious to any fair-minded person. It's never wise to put the rabbits in charge of the lettuce patch. An outside and totally independent agency should be brought in to conduct the study. The quality of fishing in the tributaries at the south end of Cayuga Lake has been deleteriously affected because of the return pipe's placement in only nine feet of water. At very least Cornell ought to be ordered to extend the pipe at least another quarter to a half-mile. That way the warmed return water would be mixing with 42-degree water, thus reducing the phosphorous build-up in the south end of the lake. As far as I know, the potential impact on sport fishing in the lake was never even considered by the DEC when the project was initially approved, something which borders on malfeasance. Allowing Cornell to police itself on this matter is simply inimical to the public interest.

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Subject: Comment on Permit NY0244741."

The 30,000 cows in the Salmon Creek water shed
are helping load the lake with phosphorous