Thank you for your comment, Richard Sparks.

The comment tracking number that has been assigned to your comment is GLMRISANS50146.

Comment Date: February 16, 2012 16:26:22PM
GLMRISANS
Comment ID: GLMRISANS50146

First Name: Richard
Middle Initial:
Last Name: Sparks
Organization: University of Illinois (retired)
Address: Dr. Richard Sparks
Address 2:
Address 3: P. O. Box 176
City: Elsah
State: IL
Zip: 620280176
Country: USA
Privacy Preference: Don't withhold my personal information from the website and NEPA documents
Attachment: Sparks Comments on ANS Control Paper 16feb2012.docx

Comment Submitted:

# Sparks Comments on ANS Control Paper
**16 February 2012**

## Consider Combinations of Controls and Near- and Long-Term Measures

The draft report and fact sheets consider 27 potential ANS controls. Both sources provide much useful information. However, I think it would also be useful to include a brief discussion of possible scenarios that would include *combinations* of interim measures that might be deployed quickly and other *combinations* that would necessarily take longer to implement because of complexity and cost. The interim measures buy time to evaluate, plan and implement the more complex and costly measures.

Will there be some synthesis and integration (see next paragraph) in this report? If not here, then where?

## Consider Benefits of Integration of Invasive Species Management within a Comprehensive Water Resources Plan for Northeastern Illinois

A combination of improvements in invasive species management, storm water management, water supply for northeastern Illinois, water-based recreation, and transportation is likely to have a more favorable benefit-to-cost ratio than if each improvement were evaluated separately. In fact, some of the suggested controls, such as hydrologic separation, cannot be done without affecting the other uses. For example, hydrologic separation is likely to require some degree of reestablishment of the natural drainage of the Chicago region into Lake Michigan. The *benefits* of this and other required improvements (such as additional stormwater detention and treatment) should be accounted for, not just the costs. A particularly important potential benefit is the return of treated Lake Michigan water to the Lake, which would effectively increase the water supply by allowing Chicago and its collar communities to withdraw more water from the Lake—the withdrawal is currently limited by a Supreme Court because the water is transferred away from the Great Lakes drainage basin and its water users in other states and provinces into the Illinois River-Mississippi River drainage.

## Comments on Specific Measures

**Hydrologic Separation.** The focus in the report is on physical barriers, which are attractive because they would eliminate transfer of all species in either the upstream or downstream directions. However, there is some potential for combination approaches using electricity and existing physical barriers (locks and dams) that might provide a high degree of hydrologic separation, without eliminating boat passage. Graduated, nonlethal electric fields could be utilized at existing locks to deter fish and other motile organisms from entering the lock chambers or passing over or through dams. An additional, stronger electric field could be applied within a lock, to kill organisms that attach to boats or enter with the boats. The killing electric field would only be applied when a boat was in the chamber and after the pilot and lockmaster confirmed that all safety precautions had been taken (no human in contact with the water, grounding and other anti-sparking measures in place, etc.).

Another approach would be to use treated water during the locking cycle, instead of upstream or downstream water. This approach would require improvements in stormwater and wastewater systems in Chicago so that water could be discharged to Lake Michigan (see below). The lock could be situated near an existing municipal or industrial wastewater treatment plant whose effluent would contain no invasive species. Upbound boats and barges (toward Chicago) would enter the lock, which then would be filled with treated effluent. The upstream gate would open, and the boats and treated effluent would then pass upstream toward Chicago. The treated effluent would ultimately pass back into the lake from which the water was originally withdrawn. Downbound boats and barges (leaving Chicago) would also enter the lock, but the treated effluent and the boats would pass downstream when the downstream gates opened. The river and the lake would thus be hydraulically separated, and there also would be an opportunity to use treatments, such as strong electric fields within the lock chamber, to disinfect the barges and any water that might inadvertently enter the chamber from the lake side or river side. Nonlethal electric barriers would be needed upstream and downstream of the new lock to prevent adult fish from swimming into the lock with the tows. As mentioned above, the benefit of returning treated water to the lake is that northeastern Illinois communities, including Chicago, could escape from the water withdrawal limitation imposed by the Supreme Court.

**Alteration of Water Quality.** The listed alternatives all involve the addition of chemicals to create toxic conditions or reduce oxygen and nutrients. Another approach that may not require any addition of chemicals is to turn off the upstream aeration systems (e.g., at the confluence of the Chicago Sanitary and Ship Canal [CSSC] and the Cal-Sag Canal) and allow some dischargers of nontoxic organic waste (municipal sewage treatment plants, starch plants) to discharge more oxygen-demanding waste than currently allowed. The objective would be to create a hypoxic zone in a limited section of the Chicago Area Waterway System, preferably where there is downstream aeration to restore the oxygen levels. An example location would be the reach in the CSSC from the Cal-Sag junction downstream to the Lockport Lock and Dam and powerhouse. The dam and powerhouse provide some aeration and more would be provided if proposed bubble barriers are installed downstream of the lock and at the mouth of the Des Plaines River.

Preliminary modeling work has already been undertaken by Professor Marcelo Garcia and his colleagues at the University of Illinois, Urbana-Champaign. Their results indicate that if the aeration were shut off, there would be an oxygen sag in the CSSC, but not to zero and perhaps not low enough to deter or kill organisms. The problem is that the aquatic microbes exhaust their food supply (organic matter in the water) before they use up the available oxygen. Hence, additional organic matter would have to be allowed in the canal to drive down the oxygen.

Thank you for the opportunity to comment.

Dr. Richard Sparks
Director, Illinois Water Resources Center (retired)
P. O. Box 176
Elsah, IL 62028
618-786-2811
rsparks@illinois.edu