

## **Soil & Water Conservation Society of Metro Halifax ('SWCSMH')**

*(a volunteer scientific stakeholder-group)*

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**Ref.:** WAB0011 (total= 3 pages)  
**To:** Chairman Dr. Wayne Stobo and Members,  
Halifax/Halifax County Watershed Advisory Board (WAB), HRM  
**From:** S. M. Mandaville (Professional Lake Manage.), Chairman and Volunteer  
Exec. Director  
**Date:** May 17, 2000  
**Subject:** **Our recommendations w.r.t. the Western Common, HRM**

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Our recommendations for this major project are as follows and we will be pleased to provide scientific justification if asked to. We have conducted the Chemical Limnology of the downstream lake, Whites Lake. In addition, I have also conducted the Predictive P-Modelling of the entire Prospect River and the Nine Mile River watersheds among several others in Nova Scotia. Further, I have also documented historical data from other sources as well some of which are available for downloading from our web space.:---


**1. HRM should set a maximum allowable mean yearly Chlorophyll-a (Ch-a) levels as the 'lake carrying capacities' for Otter, Blueberry, Ragged and Big Indian lakes. The said Carrying Capacity for these lakes should be set at 30% maximum over the pre-development yearly mean Ch-a. The yearly mean Ch-a should be ascertained as follows:**

- 1.1. For a minimum period of 12 months, preferably for 24-months **prior** to any further development, HRM should carry out monthly sampling during the Fall, Winter and Spring seasons, and a bi-weekly sampling during the Summer season for Chlorophyll-a.
  - 1.1.1. Chlorophyll-a is to be measured within the euphotic zone. Simply, the euphotic zone is defined as the depth at which the light intensity of the photosynthetically active spectrum (400-700 nm) equals 1% of the subsurface light intensity (from photometric measurements with a Spherical Quantum Sensor and a DataLogger). Where this information is not available, a Secchi disc (SD) reading in which  $Z_e = 2.5 * SD$  metres may be used (Vollenweider and Kerekes, 1982). For coloured i.e., dystrophic

lakes, the factor will be lot lower and is approximately  $Z_e = SD$  metres (pers. comm. Kerekes, 1991).

- 1.2. The HRM should sample the lakes continuously during the 'development phases' as well, preferably using the above protocol which was derived from the world-class OECD (Organisation for Economic Co-operation and Development) peer consensus studies culminating with the Final Report by Vollenweider and Kerekes (1982).
- 1.3. If the mean Ch-a value exceeds the Lake Carrying Capacity as ascertained above, then consideration should be given for halting any future development until the necessary treatment upgrades are made.

..... *and (not either/or)* .....

2.  **HRM should implement and/or cause to implement 'preventative measures' prior to any future development(s), and these should include but not limited to:**
  - 2.1. **Comprehensive stormwater treatment systems for the removal of various pollutants, not just phosphorus.**
    - 2.1.1. **Consideration should also be given to stormwater treatment to improve bacteriological quality of post-development stormwater inputs to lakes, e.g., UV treatment as in the case of the City of Nepean, Ontario, and/or other guaranteed BATs (Best Available Technologies).**
  - 2.2. **Institute controls on the numbers of onsite septic systems within 300-metres of lakes by:**
    - 2.2.1. **enforcing 100-150 metre minimum setbacks from lakes rather than the NSDoE standards . The NSDoE guidelines WILL NOT protect the lakes on decadal-time scales as proven time and time again.**

**2.2.2. Pollutant contribution via groundwater from onsite systems to inland lakes occurs over decadal time scenarios and will not be easily evident over shorter time scales!**

## **References**

- Mandaville, S.M. 2000. Limnology- Eutrophication and Chemistry, Carrying Capacities, Loadings, Benthic Ecology, and Comparative Data. Soil & Water Conservation Society of Metro Halifax. xviii, Synopses 1, 2, 3, 13, and 14. 210p. *{available from the NovaNet libraries}*
- Mandaville, S.M. 2000 (under preparation). Limnology in Nova Scotia: Lake Data and Predictive Phosphorus Models– Archives in Electronic Format. First Ed. Soil & Water Conservation Society of Metro Halifax. xii, 74p, a-d. 90p., & CD media. *{will be available from the NovaNet libraries}*
- Soil & Water Conservation Society of Metro Halifax. 1993. Compendium of Synopsis and Briefs, being extracts from credible literature in Theoretical/Applied Limnology with emphasis on Lake Restoration/Management. 135p.: ill. *{available from the NovaNet libraries}*
- Soil & Water Conservation Society of Metro Halifax. (considerable related info available from our web files): <http://www.chebucto.ns.ca/Science/SWCS/SWCS.html>.
- Vollenweider, R.A. 1976. Advances in Defining Critical Loading Levels for Phosphorus in Lake Eutrophication. Mem. Ist. Ital. Idrobiol. 33:53-83.
- Vollenweider, R.A., and Kerekes, J. 1982. (OECD, 1982). Eutrophication of waters. Monitoring, assessment and control. OECD Cooperative programme on monitoring of inland waters (Eutrophication control), Environment Directorate, OECD, Paris. 154p.

### **Cc:**

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