

Executive Summary

In February, 2003, Manitoba Water Stewardship Minister Steve Ashton (formerly Minister of Manitoba Conservation), announced the Lake Winnipeg Action Plan. This Plan included the formation of a Lake Winnipeg Stewardship Board to help Manitobans identify actions necessary to reduce nitrogen and phosphorus loading to Lake Winnipeg to pre-1970 levels.

Research, as well as observations by those who work and live on Lake Winnipeg, has demonstrated that water quality on the lake has deteriorated. Increased nutrient loads to the lake has led to an over-abundance of algae in both summer and winter. Large blooms of algae have been documented in both the north and south basins of the lake. Increased abundance of undesirable species of algae can impact:

- (1) the aesthetic appeal of the lake,
- (2) safety of water for recreational uses and consumption,
- (3) aquatic habitat,
- (4) biodiversity, and
- (5) long-term ecosystem sustainability.

Lake Winnipeg's watershed is enormous and includes parts of four provinces in Canada and four states in the United States. The watershed supports a number of important economic interests and much or all of this human development has had some impact on the water quality in Lake Winnipeg. In addition, nutrients are also contributed to Lake Winnipeg naturally from the rich prairie soils in much of the watershed.

The Lake Winnipeg Stewardship Board is pleased to provide its first Interim Report to the Honourable Steve Ashton, Minister of Water Stewardship. This first Interim Report provides initial guidance to the Province of Manitoba on strategies to reduce nutrient loading to Lake Winnipeg based on the Board's collective knowledge, experience, and investigations.

The Lake Winnipeg Stewardship Board has made recommendations on 32 separate issues. Details are provided on each of these issues in this report.

The following is a summary of the Board's recommendations.

Recommendations

1.0 Transboundary and Inter-jurisdictional Issues

- 1.1 The Government of Manitoba, with the support of the Canadian Government, should continue to communicate with North Dakota and Minnesota regarding transboundary issues related to the Red River, and ultimately to Lake Winnipeg itself.
- 1.2 The Manitoba government needs to continue to work with neighbouring jurisdictions in Saskatchewan and Alberta through the Prairie Provinces Water Board to develop commitments to reduce phosphorus and nitrogen loadings entering Manitoba.
- 1.3 The governments of Manitoba and Canada are urged to initiate discussions with the Province of Ontario with the goal of developing targets for nutrient contribution in the Winnipeg River at the Manitoba/Ontario boundary.
- 1.4 The Province of Manitoba needs to strengthen its working relationship with Canada on First Nation issues related to impacts on water quality, and each should be prepared to accept their full fiduciary responsibilities as per their constitutional obligations.

2.0 Nutrient Loss from Confined Livestock Areas and Over-Wintering Sites

- 2.1 Drainage from confined areas should be directed to retention basins, grassed buffer strips, and constructed wetlands, or other effective nutrient reduction practices should be employed.
- 2.2 Where possible, holding areas and wintering areas should be used on a rotational basis to prevent a build-up of nutrients in the soil. Otherwise, manure in confined holding areas should be regularly removed and applied to crop or pasture lands at agronomic rates.
- 2.3 Legislation should be reviewed and revised where appropriate to include small as well as large livestock operations, and to ensure that new or expanded confined operations are constructed to meet contemporary environmental standards.
- 2.4 Government should intensify its agriculture extension programs (such as those offered by Manitoba Agriculture, Food, and Rural Initiatives) and those delivered in partnership with existing or new programs to help producers assess the environmental risk of their operations, and to provide advice on how to prevent the contamination of groundwater and surface water.

3.0 Livestock Access to Riparian Areas and Waterways

3.1 Livestock producers should be directed through incentives, education, and regulations to implement measures to protect riparian areas and waterways, such as managing livestock access in riparian areas and providing off-site watering structures.

4.0 Soil Fertility Testing on Agricultural Land

4.1 Develop strategies that promote and support annual soil testing. Provide the tools necessary to make sound agronomic decisions.

4.2 Consider incentives and subsidies for producers conducting soil testing, similar to private drinking water testing subsidies.

4.3 Ensure that soil test laboratories are accredited, and are using accredited analytical methods and fertilizer recommendations that are appropriate for Manitoba soil, crop, and climatic conditions. Soil test recommendations need to reflect the difference between commercial and organic fertilizer use.

4.4 Ensure that soil test recommendations and reports are user-friendly and informative to producers.

4.5 Enhance education on the economic and environmental benefits of soil testing.

5.0 Matching Nutrient Inputs with Crop Nutrient Requirements and Exports, and Establishing Soil Phosphorus limits

5.1 The Province should adopt an interim soil phosphorus regulatory limit for agricultural land in Manitoba by March 2005. This interim regulatory limit should consider soil phosphorus limits set by neighbouring jurisdictions such as Minnesota.

5.2 A terrestrial nutrient budget should be developed for Agro-Manitoba which would assist producers, municipalities, and regulators in siting intensive livestock operations, and managing manure.

5.3 Where excess nutrients are being generated, practical options for exporting manure to nutrient-deficient areas must be considered.

6.0 Evaluation of Beneficial Management Practices as Nutrient Reduction Strategies

6.1 Undertake focused research to determine what beneficial management practices appropriate for Manitoba conditions would be effective in reducing nutrient loading to the Lake Winnipeg watershed.

7.0 Nutrient Inputs from Agricultural Tile Drainage

7.1 Where feasible, tile drainage water should be directed into retention basins, held and, reused when supplemental water is required for agricultural land.

7.2 Producers considering tile drainage should investigate new tile drainage systems, such as “controlled drainage”, which regulates the quantity of water removed at different times of the year, so that excess water and the associated nutrients are not removed unnecessarily.

7.3 The process of obtaining a permit to install tile drainage should be reviewed with the aim of ensuring that water quality issues are considered in addition to water quantity

8.0 Integrated Watershed Management Planning and Management

8.1 Manitoba Water Stewardship should establish Watershed Management Districts province-wide that would be responsible for preparing, implementing, and regulating watershed management plans as outlined in Part 3 of the proposed Water Protection Act.

8.2 Watershed Management Districts should be established based on natural watershed boundaries rather than municipal boundaries.

8.3 Watershed Management Districts should be responsible for managing all drainage issues, including in-field drainage activities and the drainage of natural wetlands. The Province should retain responsibility for issuing permits for these projects.

9.0 Drainage of Surface Water From Agricultural Lands

- 9.1 A review of agricultural land drainage networks on a watershed basis should be undertaken. This review should explore the feasibility of reducing the velocity of flow in agricultural drains to allow particulate nutrients an opportunity to settle out. The use of nutrient traps or settling basins should be explored to determine their effectiveness in reducing nutrient loading along drains. This work would include a review of the feasibility of acquiring marginal land and wetland areas that could serve as natural filters for drain water.
- 9.2 Drain construction and maintenance practices should be reviewed to minimize nutrient loss to the watercourse. This would include exploring vegetation harvesting opportunities in areas where this is not already done.
- 9.3 All drainage projects where water leaves private property, including the drainage of natural wetlands, should require a permit. Compliance with this requirement should be enforced.

10.0 Cosmetic Use of Phosphorus-Based Fertilizers

- 10.1 The Province should explore the option of implementing province-wide restrictions on the use of phosphorus-based fertilizers for cosmetic use in Manitoba.
- 10.2 The Province of Manitoba and the Government of Canada should implement restrictions on the cosmetic use of phosphorus fertilizers for lawn care on provincial and federal properties.
- 10.3 Canada should institute a consistent policy for the use of fertilizers for cosmetic use on all Federal lands, including National Parks and First Nation communities.

11.0 Water Usage, Sewage Treatment, and Related Financing

- 11.1 The Government of Manitoba should ensure that all Manitobans are served by wastewater treatment practices that safeguard human health and water quality.
- 11.2 Manitobans should pay the true cost of the water they consume, and the true costs of the services required to adequately treat wastewater.
- 11.3 Utility reserves must be established such that monies are available when utility upgrades are required. Monies collected for these reserves need to be protected from competing financial needs.
- 11.4 In order to promote efficient water use and effective waste treatment, metering of regional water supplies should be implemented and rates should be based on consumption, and the true cost of providing the service.
- 11.5 Extraneous groundwater inflow into wastewater collection systems needs to be investigated and minimized were feasible.

12.0 Regionalization of Wastewater Treatment Services

- 12.1 The Province of Manitoba should promote regionalization of wastewater treatment systems.
- 12.2 Provincial funding through the Manitoba Water Services Board should be explicitly tied to an evaluation of regionalization opportunities. Funding priority should be given to those systems that are employing nutrient removal technologies.
- 12.3 Comprehensive sewage management plans should be developed for areas of the Province where existing sewage treatment practices (septic fields, holding tanks, lagoons) are not meeting environmental standards.
- 12.4 There is a need for the Province and Canada/Indian and Northern Affairs Canada to work together more cooperatively on regional sewage management plans.

13.0 Development of Nutrient Abatement Plans for Wastewater Treatment Facilities in Manitoba Communities

- 13.1 The Province of Manitoba needs to finalize its Nutrient Management Strategy along with developing a comprehensive prioritized plan for nutrient abatement for all wastewater treatment facilities in the watershed. The comprehensive plan needs to consider whether the application of best practicable technology is sufficient for reducing effluent phosphorus concentrations to 1 milligram per litre or whether best available technologies need to be employed to achieve greater reductions and the plan needs to consider where nitrogen removal is necessary and to what level.

13.2 Nutrient reduction strategies such as biological treatment, chemical treatment, effluent irrigation, constructed wetlands, and other proven technologies need to be evaluated for their effectiveness and practicality given Manitoba conditions and economic circumstances. Source control, pollution prevention plans should also be implemented as measures to reduce nutrient input.

13.3 The Province of Manitoba should continue to require that nutrient reductions be implemented as quickly as possible at the large municipal and industrial wastewater treatment facilities in the cities of Winnipeg, Portage la Prairie, and Brandon.

14.0 Environmental Planning for New Urban and Rural Development

14.1 The Province and municipalities should establish an integrated land and water planning process that is environmentally conscientious and that ensures planned and orderly growth with respect to sewer and water services. This process would encourage planning, rather than discourage growth.

14.2 The Province should ensure that all new rural residential, commercial, industrial, and urban developments are comprehensively reviewed with respect to water and wastewater treatment requirements to protect the environment.

14.3 Developers should be required to consider the cost of the required water and wastewater treatment services and ensure that these are built into the costs of the development (full cost recovery). It is expected that different strategies for wastewater treatment would be required depending on the local conditions.

14.4 There is a need to consider regional wastewater treatment services for new rural residential developments.

14.5 Developers should be responsible for land drainage issues for new residential developments which consider the nutrient impacts of the development and build in strategies to minimize these impacts such as storm water retention and treatment, and erosion control. Developers should be required to implement strategies to retain rainwater and reduce runoff.

14.6 All new urban and rural development projects should be required to incorporate low impact, environmentally-conscious concepts into the design with the aim of reducing environmental service costs to minimize pollution loads. These may include re-use of rainwater, reducing runoff by incorporating more permeable surfaces, and retention ponds.

15.0 Environmental Licensing Fees

15.1 The Province should look for opportunities to reduce the financial disincentives to those proponents voluntarily improving waste management practices such that the risk of nutrients and other contaminants reaching surface water is reduced. The Province could consider establishing a fund, perhaps within an existing funding program (e.g. Sustainable Development Innovation Fund, or Manitoba Water Services Board) that would be directed towards reimbursing proponents for the cost of the Environmental Licensing Fee, where a demonstrated improvement to the environment is realized.

16.0 Land Application of Municipal Effluents

16.1 Effluent irrigation should be promoted and encouraged where feasible, and in consideration of potential health risks.

16.2 Alternatives to the water softener sodium chloride should be explored to ensure wastewater is more suitable for land application (e.g. Potassium chloride).

17.0 Leachate Handling

17.1 The Province should evaluate options to remove leachate from domestic wastewater treatment systems such as the option of a dedicated leachate treatment facility being established within the province. Priority should be given to dealing with leachate which is of poorest quality and highest quantity.

17.2 In order to minimize the amount of toxic substances collected in landfill leachate, the Province should expand opportunities for the public to safely and conveniently recycle and dispose of toxic substances.

18.0 Management of Domestic Septage and Greywater

18.1 The Province should develop a strategy for handling of septage and greywater in an economic and environmentally sensitive manner, in consideration of potential health issues. This should include options for handling these wastes within existing wastewater treatment facilities as well as the option of controlled and managed land application of this waste. Strong deterrents for those who illegally dispose of septage in ditches or other inappropriate locations are required.

18.2 The Province of Manitoba should undertake a review of septage and greywater re-use being employed in other jurisdictions to assess its feasibility for Manitoba conditions. Health risk issues associated with these re-uses need to be fully explored.

19.0 Water Use Efficiency

19.1 The Manitoba Building Code and the National Building Code should be revised to require all new homes to be fitted with low-flush toilets and low-flow faucets.

19.2 Governments should demonstrate leadership by instituting a program to convert fixtures in government-owned buildings to water saving fixtures. When Government agencies are leasing space, a condition of tenancy should be the conversion of existing fixtures to low water flow alternatives.

19.3 All levels of governments should consider incentives or rebates for homeowners to retrofit fixtures to low flow alternatives. An environmental levee for the purchase of higher volume fixtures should be considered.

19.4 A public education program should be implemented to increase the safe collection and use of rainwater for lawn and garden use.

19.5 Ensure that water users on regional water systems have water meters and are billed on a water use basis, at the full cost of the water supply.

19.6 Consideration should be given to applying higher rates as usage increases. Reduced water rates for large commercial and industrial consumers should be reconsidered.

20.0 Using Constructed Wetlands for Nutrient Removal

20.1 The Province of Manitoba should undertake a focused review of the effectiveness of constructed wetlands as a nutrient abatement strategy. The study should consider local climatic conditions, as well as management requirements such as vegetation harvesting.

21.0 Storage Requirements for Municipal Lagoons

21.1 The Province should explore the option of expanding the storage capacity of new and expanded lagoons to 400 days. Water conservation strategies will assist municipalities in realizing this capacity.

22.0 Stormwater Retention Ponds

22.1 All new stormwater retention ponds should be designed to maximize nutrient retention without compromising stormwater management needs.

22.2 Monitoring should be conducted to compare managed ponds with unmanaged ponds in their nutrient removal capabilities. Data from other jurisdictions with a similar climate should be collected to help determine the best design and management strategy for nutrient capture under Manitoba conditions.

23.0 Nutrient Management Issues on First Nations Communities

23.1 Sewage treatment on First Nation communities must be upgraded to meet both public health and environmental standards. As a minimum, Provincial standards should be communicated to Indian and Northern Affairs Canada and First Nation communities to be used as guidelines.

23.2 Immediate action needs to be taken to remedy malfunctioning or non-existent waste management systems in First Nations communities, and to address the problem of sewage disposal. Alternative waste management systems such as composting systems and constructed wetlands need to be explored.

23.3 Nutrient management strategies which evaluate the sources of nutrient losses, and identify opportunities to reduce or eliminate these losses should be developed in collaboration with First Nation communities. The strategies should include a strong educational component.

23.4 The Province should work towards ensuring that sewage treatment and disposal standards are consistent across the province, including those regulating First Nations and Northern communities.

23.5 Senior levels of government should provide adequate levels of funding within their respective jurisdictional responsibilities, to support education, training, and resourcing to ensure that waste treatment facilities in First Nations communities are properly maintained and operated.

24.0 Septic Field Alternatives

24.1 There is a need to implement regional sewage treatment plants with nutrient removal capabilities prioritizing areas such as those in high residential density, and proximity to waterbodies.

24.2 Where regionalization of sewage treatment is not feasible, or as an interim measure until regionalization is practicable, alternatives to septic fields should be explored.

24.3 The Province should explore the option of instituting an annual levy to recover the costs of conducting an ongoing comprehensive septic field inspection program, and maintaining a septic field database in the Province.

25.0 Manitoba Water Services Board

25.1 The Province of Manitoba needs to explore options for how nutrient removal upgrades may be best funded, and how Provincial funding through the Manitoba Water Services Board should support the commitments in the Lake Winnipeg Action Plan.

25.2 Manitoba is urged to establish criteria to assist the Manitoba Water Services Board in prioritizing funding requests that would favour implementing regional options for wastewater treatment facilities.

26.0 Phosphoric Acid Use in Water Supplies

26.1 The Province should initiate a project to identify the number of communities in Manitoba in addition to Winnipeg and Portage la Prairie that are using phosphorus-based strategies for lead control in water mains and in collaboration with each community, determine the amount of phosphorus lost to receiving water. This evaluation should consider phosphorus removal plans being implemented for these wastewater treatment facilities.

27.0 Use of Alum as a Nutrient Control Strategy

27.1 A review of the use of alum in wastewater treatment should be conducted. This review would evaluate the resultant concentration of aluminum in the waste sludge and determine whether these levels pose any environmental or health risks. The suitability of applying this type of sludge to land should also be investigated.

28.0 Phosphorus Content in Cleaning Supplies

28.1 Manitoba Water Stewardship should raise the issue of the lack of regulation controlling phosphorus content in cleaning solutions with the Canadian Council of Environment Ministers with a view to having the Federal Government restrict the phosphorus content in those cleaning products currently not regulated. The Province of Manitoba should raise this issue with the Federal Government.

29.0 Science Needs for the Long-Term Protection of Lake Winnipeg

29.1 On-going research and monitoring will be required on Lake Winnipeg to address outstanding information gaps and to monitor progress towards achieving the established targets for nitrogen and phosphorus. To this end, Manitoba Water Stewardship, Environment Canada, and Fisheries and Oceans Canada are urged to continue their existing process to develop and then implement a collaborative, long-term science plan for Lake Winnipeg.

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- 29.2 The Province of Manitoba should consider jointly funding a Research Chair specializing in hydrological and contaminant transport mechanisms at the terrestrial-aquatic interface, at one of the academic institutions in Manitoba. Support could be provided by both senior levels of government. The establishment of such a position would require the establishment of strong partnerships among other academic institutions in Manitoba and with provincial and federal government departments with a mandate in this area. To assure success, it will be necessary to provide some initial operating funding and to provide annual direction to assist with setting and maintaining research priorities.
- 29.3 Manitoba Water Stewardship must continue its work towards completing the Nutrient Management Strategy announced in April 2000. In particular, draft water quality objectives for nutrients in Lake Winnipeg that are based upon ecologically-sensitive end-points must be developed as quickly as possible. Following the development of these objectives, broad consultations will need to be undertaken involving the local Lake Winnipeg communities, scientists, contributing sectors within Manitoba, upstream jurisdictions, and others. These long-term water quality objectives will then replace the interim targets identified in the Lake Winnipeg Action Plan.
- 29.4 Manitoba Water Stewardship must continue its long-term water quality monitoring of streams contributing to Lake Winnipeg and should be encouraged to augment this routine monitoring to better estimate loadings of nutrients from short-term runoff of rain and snowmelt events. It is also important that this monitoring continue in order to track progress towards achieving the targets set for Lake Winnipeg.
- 29.5 The Province of Manitoba should consider developing and implementing a focused program of applied research aimed at better understanding of the human-induced changes in water flows, seasonal lake residence time, and lake levels on nutrient dynamics relevant to Lake Winnipeg.

30.0 Education Program Development

- 30.1 The Manitoba Department of Education should design teaching units, credit courses, and upgrade holistic environmental curricula specific to Lake Winnipeg and its watershed for implementation in Manitoba schools.
- 30.2 An awareness of the issue of Lake Winnipeg water quality and watershed influences must be created among educational staff in First Nations schools, both teaching staff and administrative staff involved with curriculum development.

31.0 Public Education on Water Quality Protection

- 31.1 The Province of Manitoba should develop a public education campaign/program to help Manitobans understand the importance of making the appropriate personal choices on issues that will affect water quality in Lake Winnipeg and its watershed.

32.0 The Lake Winnipeg Stewardship Board's First Interim Report – Public Discussion

- 32.1 The Board recommends that a focused public discussion be undertaken on many of these recommendations, and with those who may be affected by these recommendations.