# MANITOBA ECO-NETWORK

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Mr. Bob Betcher
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Attention: Mr. Betcher

The Manitoba Eco-Network Water Caucus is pleased to provide input into Manitoba Conservation and Water Stewardship's new Groundwater and Water Well Act.

Groundwater is the source of drinking water for most Manitobans outside the Winnipeg Urban Area, and is a key part of the hydrological system, interacting with lakes, rivers, wetlands, soil, and vegetation. Unfortunately, this resource is not well understood, gets less legal protection than surface water, and often draws attention only at moments of crisis. Because it can take hundreds or thousands of years to replenish, we need careful stewardship of groundwater.

A precautionary approach must be taken to any developments in potentially sensitive regions, particularly in areas determined to be sensitive, such as recharge zones or areas with shallow overburden.

Major groundwater contamination concerns from human activities are related to leaks and spills from petroleum storage facilities, agriculture practices, waste disposal practices, leakage from agricultural and municipal lagoons, saline water intrusion from over-development of fresh groundwater supplies, seepage from septic systems and bacterial contamination related to well construction and maintenance practices. Groundwater movement is slow, so contamination tends to be concentrated and localized at source. Reversal of contamination is expensive, difficult, and can take decades. The following list looks at potential threats to Manitoba's groundwater, and a list of protective priorities can be found at the end of this document:

**Overdevelopment:**
Groundwater quality problems have been experienced in several aquifers in southern Manitoba where overdevelopment has led to saline water invasion of fresh water portions of the aquifers. Local saline water intrusion has occurred in parts of southeastern Manitoba where fresh groundwater in the carbonate aquifer is underlain by saline groundwater in the Winnipeg

Formation. There is considerable potential for an increasing number of saline water intrusion problems given the existence of significant areas with fresh water-saline water boundaries, either as vertical or lateral water quality transitions, and increasing groundwater development pressures.

**Landfills:**
Landfills are supposed to have a protective bottom layer to prevent contaminants from getting into the water. However, if there is no layer or it is cracked, contaminants from the landfill (car battery acid, paint, household cleaners, etc.) can make their way down into the groundwater.

**Oil/Gas:**
Manitoba has experienced a long history of groundwater contamination from leakage of petroleum products from underground storage tanks. Significant contamination has been reported in Brandon, Cypress River, Ashern, Birds Hill, Stonewall, Fisher Branch, Easterville and a host of other areas. Numerous wells have been drilled as open holes through aquifers by well drillers searching for increased well yields, naturally soft groundwater and even oil. The resulting outflow of saline water into the carbonate aquifers has, in many cases, resulted in contamination of nearby fresh groundwater supplies.

**Industrial Waste:**
A number of significant groundwater contaminations have occurred in Manitoba due to spills or improper disposal of industrial wastes. The solvents trichloroethylene (TCE) and 1,1,1-trichloroethane (TCA) have been found near the Town of Stony Mountain. Contaminants have migrated up to 7km from the industrial site, affecting the water quality in 37 private wells. This contamination has forced the construction of a piped water system to service the affected areas at a cost excess of $800,000. In Winnipeg, soil and groundwater contamination by organic chemicals has been found at two industrial sites.

**Septic Systems:**
Due to the sensitivity of many shallow aquifers, Manitoba has experienced some local groundwater quality deterioration from direct or indirect infiltration of lagoon and septic tank effluents. Little of this has been fully documented. Concerns exist that extensive water quality impacts may occur in some sensitive groundwater areas where residential developments rely on individual wells and septic tanks. Most contamination events investigated to date seem to relate to well construction problems or septic system malfunctions.

**Industrial Agriculture:**
There is considerable evidence that agricultural activities have resulted in some degree of impact on groundwater quality in many sensitive groundwater areas of Manitoba, although the impact in most cases is thought to be local. Most research has focused on the accumulation of nitrate-nitrogen in the soil zone and in underlying groundwaters resulting from storage and spreading of farm manures, application of commercial fertilizers and feedlot operations. In general, most agriculture related groundwater quality problems have occurred in areas underlain by sandy overburden with shallow surficial aquifers. However, groundwaters

containing high nitrate concentrations have also been identified in parts of the Interlake areas and in south-central Manitoba where fractured carbonate and shale aquifers are overlain by thin covers of glacial and postglacial materials.

**Bacterial Contamination**

Bacterial contamination of groundwater supplies is quite common in Manitoba. The vast majority of problems appear to be very local in nature and could be eliminated by proper well construction and maintenance including locating wells up-gradient from potential sources of contamination.

**Changes in Precipitation and Water Scarcity**

Changes in precipitation due to climate change will be significant for Manitoba. An extensive review of Canadian climate science for agriculture conducted in 2008 by Natural Resources Canada found as its primary key finding for the prairies: “Increases in water scarcity represent the most serious climate risk.” Melting glaciers, lower stream and lake levels, and less groundwater have already been observed. As climate change progresses, more of these changes are predicted. Water in some regions of Manitoba is likely to become scarcer and more variable. Increased temperatures may present some opportunities for agriculture and other industries in Manitoba due to a longer growing period. However, these opportunities will only be able to be realized if the region can manage an increasingly variable water supply in a warmer environment, and it can protect itself from extreme weather events caused by climate change.

**Recommended management actions & strategies to address the above issues**

1. Prioritize ecosystem and basic human needs over economic activity by establishing a sustainability boundary ensuring that water demand does not exceed capacity. Recognize ecosystems as legitimate water users with specific requirements for water quality, quantity and timing to maintain their health, integrity and productivity.

2. Prioritize ecosystems and human health over economic activity by implementing a multi-barrier approach, which counters threats to water all the way from watershed landscapes to the household tap, including source water protection, adequate treatment, well maintained distribution systems, strong water quality standards, regular inspection, testing, monitoring, operator training and certification, public notice, public reporting and involvement, contingency planning, research, adequate funding and enforcement.

3. Gather and provide access to reliable data on water use, including the volume of withdrawals (both licensed and actual amounts), the timing and purpose of use and the quality of water returned to the environment. Link the Groundwater Management Plan with watershed planning and development planning processes.

4. Prioritize conservation over supply expansion by maximizing the productivity of existing infrastructure and water takings through integrating water efficient technologies, conservation-oriented water fees, and public education. For example, in the agricultural sector, funding currently directed at expanding infrastructure such as dams and pipelines

should be shifted to finance studies and implementation of innovative demand management techniques such as water scheduling, efficient end-use technologies, public education, reducing losses in conveyance systems, water reuse and recycling and exploring into the limited and carefully planned use of off-stream storage.

5. **Incorporate** climate change mitigation and adaptation strategies including flexible water sharing approaches, building safety buffers into water supply calculations and flood, drought, and emergency response planning.

6. Work to develop centralized water systems, consolidating existing individual water wells in communities – water for life vs. water for profit.

7. Encourage long-term water supply planning particularly in the concentrated groundwater use region around the City of Winnipeg.

8. Work with Conservation Districts and municipalities to make additional use of monitoring information from private wells towards a comprehensive well inventory and more comprehensive water level information.

9. Collect data of actual water use in all sectors (including industrial/agricultural) and implement demand reduction.

10. Identify and protect groundwater recharge wetlands.

11. Protect our resources by prohibiting water export/diversion from Manitoba.

12. Possible conservation management strategies to consider for future water withdrawal and use: licensed users to pay for groundwater, (e.g. industry, agriculture supply) minimum usage or a water credit for use less than licensed allocation.

13. Waste management/solutions/regulations: animal units (hogs, chickens, cattle, dairy) industry, septic fields, Rural Municipalities: setback areas for all waterways to prevent contamination of surface and ground waters.

14. Public education: general public, school curriculums – on the importance of water, a conservation ethic and how not to contaminate groundwater resources.

15. Ensure public access to information on groundwater resources such as reports, mapping, etc.

16. Inventory and seal abandoned wells in Manitoba.

17. Identify locations of potential sources of groundwater contamination (e. g. waste disposal grounds, leaky or faulty septic systems, storage sites of solid and liquid manure) and undertake remediation activities where necessary.

18. Ensure the creation or continuation of public programs that assist local citizens and agriculturalists with conserving and protecting groundwater resources.

19. Develop more stringent legislation requiring the replacement of older underground tanks with either fiberglass or corrosion protected steel tankages.

20. Implement comprehensive regulations regarding well construction to ensure that wells are constructed in an acceptable manner (e.g. installation and grouting of adequate lengths of casing, eliminating the use of large diameter well pits).

Furthermore, we would like to draw attention to our concerns over possible future plans for hydraulic fracturing and/or shale-gas extraction in Manitoba. If the provincial government of Manitoba considers allowing hydraulic fracturing and/or shale-gas extraction we insist on the need for a full review of the potential health consequences of methane and other hydrocarbons in drinking water and for full disclosure of this information to the public. If the provincial government of Manitoba will allow hydraulic fracturing and/or shale-gas exploration, the groundwater act needs to enable its regulators to demand full disclosure of all processes and chemical constituents used in hydraulic fracturing fluids in order to protect Manitobans and the environment from potential contamination.

Sincerely,

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