Recommendations to the Walkerton Inquiry from the Sierra/Alert Coalition

Provincial Government: Functions and Resources Part II

Testimony presented at the Walkerton inquiry suggests that despite many factors that contributed to the contamination of the drinking water supply, animal derived bacteria were transported to the groundwater regime and in turn to a water supply well (Goss) Testimony from OMAFRA supports our position that present methods of regulating agricultural practices are insufficient to protect groundwater resources (June 18 testimony by Randy Jackiw p206, l20).

In examining and discussing the questions put forth in the meeting of May 31 and June 1 with respect to the "Role of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)", we have the following recommendations.

2.1 The integration of manure management and environmental management practices into a source protection regime. Is there room for improvement?

In Ontario there is presently no provincially mandated source protection regime, therefore, integration of manure management and environmental management into a source protection regime is not possible. Source protection has been conducted in some municipalities by including land use restrictions in their official plans. A comprehensive source protection regime needs to be put forth.

MOE should be the regulatory body in implementing a source protection strategy since as a ministry they are already responsible for protecting water resources. MOE does not have the same conflict of interest problem or perceived problem as OMAFRA has. OMAFRA should continue to support research to answer some critical questions regarding manure and the environment. OMAFRA should also be responsible for assisting farmers in achieving the required new standards with education programs, publications, and onsite support and by implementing government incentive programs which will be necessary to help offset some costs to existing farm operations.

The source protection regime needs to be based on the natural ability of the land to attenuate contaminants that are released at the ground surface. Therefore we see the source protection regime being based on the vulnerability of water resources to contamination or specifically on the availability of sufficient natural materials below the ground surface to prevent contaminants from entering water supply aquifers. Aquifer vulnerability assessments have been undertaken by various jurisdictions and although techniques vary, the end results highlight areas of high, moderate and low vulnerability to contamination. In areas of high groundwater vulnerability, consideration should be given to prohibiting practices that have a high risk of releasing contaminants to the environment. In areas of

moderate vulnerability approvals for farm activities could be based on several factors including distance to nearest wells, distance to nearest surface water body, a site assessment of the potential for impacts to groundwater etc. Areas of low risk would require a lesser degree of scrutiny. The aquifer vulnerability could be used to initially guide approvals for expansions and new operations and later could be used to prioritize required changes of existing operations.

A regime like this allows for the regulation of a variety of land uses not simply those related to agriculture. Industries that use hazardous chemicals or have historically resulted in groundwater contamination would also be prohibited in vulnerable areas. Several municipal jurisdictions have begun to use a system like this to develop official plan changes or to restrict certain business types in wellhead recharge areas.

A regime such as this allows prioritization of action. Land activities in higher sensitivity areas may be targeted for action such as:

- greater degree of site assessment and monitoring required for applications for expansions or new operation approvals, or
- prohibition of intensive livestock farms or
- caps on manure loading rates
- government incentives designed to eliminate high risk activities,
- mandatory nutrient management plans for existing agricultural operations
- site audits.
- Decommissioning of abandoned wells
- Incentive programs to improve water supply wells

Manure management practices would also be regulated based on these designated sensitivities. It is conceivable that in certain locations, land application of manure would constitute such a high a risk to water resources and would be prohibited. For example manure application in areas with very little no soil overlying a permeable bedrock aquifer could result in transmission of bacteria to the groundwater regime and, as in Walkerton, an aquifer of tyis type could allow quick transmission of contaminants to a well (Goss 2001).

The new Nutrient Management Act, 2001 (NMA) appears to be an adequate regulatory tool for the agricultural impacts on groundwater provided that adequate regulations are developed. Recommendations to address some of the present regulatory problems are:

> Section 5(2)ai governing the management of materials containing nutrients including, specifying standards for the size, capacity and location of buildings or structures that are used to store materials containing nutrients or to house farm animals……

We recommend establishing minimum standards for manure storage of 365 days for large livestock operations because there appears to be agreement in literature that manure spreading in the spring has the greatest opportunity for plant usage of the nutrient components (Goss 2001, Agricultural Code of Practice, Livestock and Poultry Manure Management BMP). The purpose is for a manure application standard that optimizes the plant uptake of the nutrient.

A regulation capping the size and density of livestock operations is needed. Large livestock operations produce massive amounts of manure, which simply carry a greater environmental risk than smaller operations. Unfortunately, accidents do happen, and when they happen at large operations, accidents may turn into catastrophes. For example, in April 1999 a lagoon at Murphy Family Farms in North Carolina, burst spilling 1.5 million gallons of waste through a hole in the lagoon. The pollution entered a tributary of the North East Cape Fear River. The cause of the catastrophe was believed to be tree roots that had degraded the integrity of the lagoon wall (Clean Water Network).

We are also concerned about the over application of manure to land. The capacity of the land to assimilate manure constituents, particularly bacteria, is not well understood. Nutrient management plans do not address some of the factors that are known to affect bacterial transport such as moisture content, soil temperature, secondary permeability of soil, and depth to groundwater. Groundwater monitoring at farms with nutrient management plans has not generally been conducted to determine if the use of the plans did prevent migration of nitrogen to the water table. It has not been demonstrated that the land can attenuate the nutrients, not to mention the pathogens, contained in the amount of manure that would be applied by a large farm on a small land base.

Large or intensive livestock operations are relatively new to Ontario's agriculture. Our knowledge regarding their impacts, socially and environmentally, is limited. Until we can more accurately assess the impacts of these operations on the environment, they should not be approved for development.

5(2)a ii governing the management of materials containing nutrients including, specifying standards relating to the construction on an agricultural operation of the buildings or structures …..

Standards for building a storage facility should address groundwater susceptibility to contamination on the farm and groundwater conditions beneath structure in the event that a spill occurs. If shallow groundwater is present or the underlying materials do not provide adequate protection,

secondary containment such as an impermeable liner should be installed beneath concrete liquid manure storage.

On site monitoring of foundations should be conducted. This can be accomplished by constructing a perimater drain around the barn and the manure storage with an observation well at the outlet. This would allow quick and inexpensive monitoring of the storage integrity.

Lagoons in other industrial sectors must comply with a different set of rules. A Certificate of Approval is required under Sections 52 and 53 of the Ontario Water Resources Act for construction of a new sewage works or modification to an existing sewage works, i.e a sewage lagoon. The Certificate of Approval requires monitoring the environment (surface and groundwater), monitoring effluent characteristics, and an environmental assessment of the receiving environment.

5(2)a iii governing the management of materials containing nutrients including respecting the **amount of materials containing nutrients** that may be applied to lands, the **quality of the materials** and the **type of land** to which the materials or a type of the materials may be applied.

The amount of manure applied to the land should be based on the ability of the environment to assimilate the potential contaminants. A site specific hydrogeological assessment for new operations would assist in estimating the potential for groundwater contamination. Assessment should show that dilution capacity is available for nutrients that are introduced to the groundwater regime. A site assessment should show that the time of travel from the operation to a local well or sensitive surface water body is sufficient to reduce the risk of bacterial contamination.

The quality of materials to be applied on the land is key in assessing the ability of the plant to uptake nutrients, manure testing must be required as part of the nutrient management strategy.

A groundwater vulnerability assessment on a regional scale will assist in designating lands that have a good capacity to prevent contamination of groundwater resources and therefore are good lands for manure spreading. The preparation of these assessments on a regional scale will assist in highlighting areas where more intensive site investigation would be required.

5(2)a iv governing the management of materials containing nutrients including respecting the time and manner in which materials containing nutrients may be applied to lands

A minimum standard should designate that nutrients be applied during periods of active plant growth (OMAFRA Land Application of Liquid Manure Factsheet, Manure Management BMP, Agricultural Code of Practice …. Goss, 2001). OMAFRA's land application of manure factsheet states that "The quicker the nutrients are used, the less the chance of pollution due to runoff into surface watercourses or leaching into groundwater sources.". Spreading during active plant growth is not always possible without damage to crops, therefore nutrients should be applied in the spring either shortly before or after planting.

5(2)b requiring farmers and other persons to meet prescribed qualifications and to pass prescribed examination in relation to the application of materials containing nutrients to land.

Requiring nutrient applicators to obtain a Certificate of Approval, similar to that of the biosolids requirements, would provide a degree of credibility to the nutrient management plan process. An individual would be accountable for the adequate application of nutrients to fields with penalties for misapplication of nutrients including fines or loss of license.

5(2)f Prohibiting the application of materials containing nutrients to lands except in accordance with a nutrient management plan prepared or approved…..

Although the nutrient management plan is a good method for estimating a balance between fertilizer applied and crop needs. Nutrient management planning is not a tool designed for providing environmental protection. It should not be used as the backbone of the regulatory regime but as one component of a broader approach. NMAN does not take human health into account. NMAN is not able to predict the transport of bacteria and other pathogens in the environment. There are several reasons why nutrient management plans are inadequate in addressing groundwater protection, these include:

- The heavy reliance on NMAN, a computer advisory tool used in nutrient management plans, is in the absence of promoting compliance with Best Management Practices
- NMAN has no capacity to predict the transport of bacteria and other pathogens
- NMAN, has limited predictive capability. In a multi-year simulation NMAN returns to the initial soil test and therefore depletions or excesses are not carried forward
- NMAN does not consider any of the climate variables, except in a limited way with respect to estimating N losses during spreading

- NMAN dose not provide an accurate balance for nitrogen because it is missing the following components: soil storage (initial conditions), atmospheric deposition, denitrification, leaching and tile drainage.
- NMAN does not account for microorganisms in any way, which are lost through tile drains or by leaching to groundwater

We recommend that the nutrient management plan be improved to incorporate a hydrogeological component that looks at the protection afforded by the subsurface soils to the aquifer system, the loading rate of manure, the potential for manure to be available for plant growth,
and the potential for manure components to leach to groundwater.

5(2)h requiring that nutrient management plans for agricultural operations or for **prescribed classes of agricultural operations**, be prepared or approved by persons who meet the qualifications specified in the regulations or who are appointed …..

Large livestock operations should be required to undertake an assessment of their operation or proposed operation similar to assessments required for communal septic systems for residential developments, sewage lagoons or biosolid spreading. All of these systems, although comparable to large manure spreading in terms of loading rates to the environment, require Certificates of Approval issued by the MOE. In applying for these certificates the proponent must show that no adverse impacts to groundwater or surface water are expected.

5(2)k specifying the length of time for which a nutrient management plan or a nutrient management strategy is valid and requiring that, at the prescribed times or when there is a prescribed change in the agricultural operation or other prescribed activity, a new plan or strategy be prepared and approved or an existing plan or strategy be amended and approved

Nutrient management plans should be valid for 3 years and should be renewable annually provided that new soils analyses and manure analyses are provided.

5(2)o providing for access to the documents in a registry …

Nutrient management plans including the application of biosolids should be registered in a public Provincial database. This database could be used to track land lease agreements, approved methodologies for manure transport, any violations by specific operators and potential cumulative impacts from nutrient applications. This registry would aid in monitoring the follow through of nutrient management plans.

5(2)p requiring that persons who manage materials containing nutrients gather samples of them in accordance with the requirements specified in the regulations.….

BMP documents contain recommendations for a protocol for manure sampling, this protocol should be reviewed and if deemed appropriate should be set out in regulation so that samples taken are representative and repeatable.

5(2)q governing the manner in which the chemical analysis mentioned in clause (p) is to be performed and requiring ….

All chemical analyses should be conducted by laboratories certified by CAEL to conduct those particular analyses.

5(2)r requiring that geophysical studies be prepared to determine the types of soils on lands and the direction of groundwater flow through lands in relation to the use of materials containing nutrients and requiring that the studies be prepared by a person who has the prescribed qualifications.

An appropriately designed hydrogeological assessment can determine the types of surficial soils, the subsurface soils, the direction of groundwater flow, an estimate of travel times in the groundwater regime, the potential for nutrient dilution or immobilization and other characteristics of the site. This assessment should be conducted by a Hydrogeologist. A geophysical study may or may not provide the required information.

A hydrogeological assessment should be required for every new livestock operation.

5(2)s respecting minimum distance separation requirements between lands to which materials containing nutrients are applied or places in which materials containing nutrients are stored or farm animals are housed, and properties surrounding the lands …. Or those other places or geographic features that are specified in the regulation

The regulations should specify appropriate separation from sensitive aquifers, sensitive surface water bodies, wellhead recharge areas, and down-gradient domestic wells.

Distance separation should be based on estimated travel times in the aquifer and not a set separation distance. If, for example, the regulation required a five year flow path from the contamination source to the well-head, then in a one aquifer that may require 500 metre separation, only 100 metres in other cases and in fractured bedrock scenarios the separation may be kilometres. Separation on aquifers with high

permeability and high hydraulic gradients would be greater than on slow moving waters. The type of contaminant could also be considered. For example, Although nitrate may not be attenuated with the greater time of travel it is more likely that bacteria will be attenuated by the increased time in the groundwater environment.

2.2 What is the adequacy of the current regulatory regime relating to potential threats to drinking water safety? Is there room for improvement?

Protecting source areas should also provide protection to drinking water quality and therefore safety. A strong source protection program should protect drinking water, surface water and water for recreational uses. The framework set out by the Nutrient Management Act has the potential to address the source protection and drinking water protection issue. However strict regulations will have to be put in place in order to make a difference to our source waters.

2.3 Standards for manure management. How are these best achieved?

Minimum manure management standards need to be set out in the Nutrient Management act. This proposed act has the ability to regulate both the nutrients and the pathogens contained in manure. Minimum standards should be phased in and should be supported by government incentives to the farmer, however some agricultural practices need to be eliminated from the Ontario landscape.

For example the practice of spreading manure at times when the natural environment is unable to provide any assimilative capacity (winter, late fall) should be eliminated, and the concentration of livestock in environmentally sensitive areas should be eliminated.

To date government has relied on voluntary measures such as BMPs and The EFP, however changes in agricultural practices are not occurring quickly enough to protect the environment. Some BMPs need to be made into minimum standards. All BMPs need to be reviewed; critical points and recommendations need to be more strongly highlighted, practices need to be prioritized so that the most destructive practices are eliminated first.

2.4 The adequacy of inspection, abatement and enforcement practices. Is there room for improvement.

The lack of enforcement suggests that the only was to go is up. MOE should be responsible for inspection, enforcement and aid in the mitigation plans. An increase in provincial groundwater and surface water quality monitoring will be required to adequately deal with complaints and to enforce action. OMAFRA should not be included in the inspection, abatement and enforcement practices.

Currently, nutrient management plans would benefit from a great deal more inspection and auditing. Some plans indicate that manure is to be hauled long distances and applied on other farms. Auditing plans like these to ensure that all manure is not applied to the same site is necessary. All plans rely on soil and manure samples to generate farm specific application rates. Despite the wide use of this tool for approvals there does not seem to be a broad requirement to collect the required data.

2.5 In addition to a clear regulatory regime and adequate enforcement of those regulations, what other tools would work well to encourage practices that meet or exceed standards?

OMAFRA should continue to play a roll in the education of farmers about best management practices and the implications of pollution. MOE and OMAFRA should fund research into new technologies that would assist with manure management and disposal.

Another method would be to amend the Planning Act and the Right to Farm legislation, to adequately deal with the new direction of agriculture. Adding a further subdivision of A1 to traditional family farms and factory farms would allow for greater taxes to offset the impacts to infrastructure, environment and aid in the mitigation of social issues. Treat different industries accordingly. The division of large and small operations would follow Section 5(2)ai of the Nutrient Management Act.

A government funded incentive program will be required to assist farmers in the transition from the present methods of farming to a future system where minimum standards exist and where certain practices are prohibited in certain areas.

3.1 The role of municipalities in source protection for drinking water safety

The provincial government should either develop or assist municipalities in developing well-head protection areas based on the recharge and source areas of municipal wells. Once these areas have been established municipalities should make the appropriate changes to their official plans to prevent the establishment of high risk land uses in those areas. The province of New Brunswick has recently passed the Wellfield Protected Areas Designation Order under their Clean Water Act which restricts land use in a recharge area at the provincial level. Livestock husbandry is completely restricted in the areas closest to the well heads, restrictions decrease in less susceptible zones.

Comments on Papers from Parties with Standing

Ontario Cattle Feeders Association

The Ontario Cattle Feeders Association (OCFA) state that water quality surveys carried out in Ontario, Quebec and New Brunswick before the construction of intensive livestock barns, show similar nitrate contamination of groundwater as more recent surveys. They conclude that sources other than intensive livestock barns are responsible for impacts to groundwater. We agree that historic nitrate levels are not the result of intensive farming, however, we do not agree with the implication that septic systems are causing the deterioration of groundwater. The effluent volumes from septic systems are not nearly large enough to create the observed regional nitrate concentrations in areas of rural Ontario, suggesting that agricultural practices are a significant contributor of nitrate. The impacts from intensive livestock operations may not have been observed yet and surveys in the future may show significant increases in nitrate concentrations in areas of dense livestock farming.

While manure production has decreased provincially, it has increased locally in areas across Ontario. The concentration of livestock operations creates small areas of immense manure production, and intense environmental hazards.

We agree with the point made by OCFA that “Hundreds of spills or (wastewater) by-passes occur each year in Ontario and they are practices, which are no more acceptable than farming practices, which ignore environmental responsibility.” Manure spills and direct wastewater discharge can impact on the environment. Wastewater by-passes are recorded and monitored while wide-spread application of waste to agricultural lands, for the most part is not.

We agree with the following statement made by the OCFA “Intensive livestock operations should not be singled out for particularly onerous requirements. Golf courses, factories, land fill sites, trailer parks and other facilities which pose a threat to the environment should be governed by similar requirements.” Golf courses, factories, land fill sites, and trailer parks are subject to environmental assessments and monitoring programs. Where septic systems are involved, impacts to groundwater are regulated according to the Reasonable Use Policy (Guideline B-7). Assessments, monitoring programs and groundwater guidelines are not required for agricultural operations. We agree that these land uses, including intensive livestock operations, should be governed by similar requirements.

In addressing the issues of standards and codes of practice for large operations OCFA offers the following belief without a reference. “While there is limited empirical evidence to establish the environmental impact of small versus large operations, the evidence that is available does suggest that the government would be working from an incorrect base if it assumes that larger operation pose a greater risk.” Current evidence collected from the United States indicates that

intensive livestock operations can cause environmental catastrophes (Clean Water Network).

OCFA cites a reference indicating that large farms generally use better manure management practices in Minnesota. OCFA also suggests that large and small operations should be adhere to the same set of standards which would minimize the risk of pollution. It is our opinion that when large operations produce massive quantities of manure, they should have different requirements over smaller operations with less waste. In Minnesota where larger farms are practicing better manure management techniques a lagoon pump malfunctioned and dumped 100,000 gallons of liquefied hog manure into Beaver Creek, killing 690,000 fish (Clean Water Network). Accidents do happen, when they happen on small farms they are typically small scale. When accidents happen on large farms, they have the potential to become environmental disasters.

Conservation Ontario: Importance of Watershed Management in Protecting Ontario's Drinking Water Supplies

The problem is the current level of funding. Not all Conservation Authorities (CAs) are well funded or have the necessary infrastructure to deal with new duties. The role of the CAs should be expanded to include delineation of sensitive areas, establishing and carrying out a monitoring strategy and providing input for planning based on social and environmental issues. Proper funding needs to be made available so that Conservation Authorities can design and implement the necessary changes and approval framework. This would include the hiring of biologists, hydrogeologists and engineers.

Ontario Farm Environmental Coalition, "Wellhead Protection Strategies: An Agricultural Perspective

This paper states that "The nutrient management plan will take into account important environmental factors such as well capture zones and geography around a well to ensure its protection". We would also like to see these factors included in the nutrient management plan.

OFEC outlines the importance of locating and decommissioning abandoned wells. We agree that abandoned wells offer a short cut for contaminants to enter and travel down the well, and that proper decommissioning of wells will eliminate a pathway for aquifer contamination.

We agree that spreading manure on the surface will allow some forms of pathogens to be killed by dessication and ultraviolet radiation. Unfortunately, ample amounts of pathogens will remain viable, and able to infiltrate or runoff to water resources (Sjogren, 1995).

We agree with the recommendations outlined by OFEC, but would like to add that an appropriate well depth should be selected according to regional land use and water quality trends. We would also like to comment on the use of nutrient management planning as opposed to restrictive zoning. Land use in areas sensitive to groundwater pollution must be properly managed. We suggest that the onus lie on the proponent to prove that the proposed land use will not impact the groundwater quality. Nutrient management plans do not presently take groundwater concerns into account and therefore are not adequate to predict the effect of land use on groundwater quality.

Sjogren, R.E. 1995. Thirteen-year survival study of and environmental Escherichia Coli in Field Mini-Plots. Water, Air and soil Pollution 81:315-335.