Chapter 4 The Protection of Drinking Water Sources

Contents

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4.1 Overview

In this chapter, I discuss recommendations for protecting sources of drinking water in Ontario. The existing legislative framework for source protection was discussed in Chapter 2.

This chapter is divided into three areas. First I provide a brief overview of the hydrological cycle (i.e., the water cycle) in Ontario and discuss issues relating to water quantity. I then set out a recommended system for protecting drinking water sources on a watershed basis. Finally, I discuss issues relating to several specific potential sources of drinking water contaminants.

4.2 The Hydrological Cycle in Ontario

4.2.1 Introduction

Of necessity, this chapter begins with a brief and elementary review of the water cycle.[1] Water enters the atmosphere when it evaporates from the oceans and other surface waters or transpires through the leaves of plants and the breath of animals (jointly, evapotranspiration). As air rises, it cools; the water vapour in the air condenses into clouds and then falls as precipitation. Once it hits the ground, water can flow over land as runoff, entering streams, rivers, and lakes to become surface water and ultimately flowing back to the sea, or it can infiltrate or percolate through the soil to become groundwater (a process sometimes referred to as recharge), which will also flow, at a slower rate, downhill toward water bodies or the sea.

Groundwater is contained in porous, water-bearing layers of rock or unconsolidated material called aquifers. Impermeable layers of rock or clay known as aquitards may separate aquifers. An aquifer with an aquitard on top of it is said to be confined, and it may be under pressure. Generally, confined

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[1] More detailed information on the hydrological cycle is widely available in geography, ecology, hydrogeology, and engineering texts, and on the Internet. For an Internet primer on the water cycle, see Canada, Environment Canada, 2002, *Water Is the Lifeblood of the Earth* <www.ec.gc.ca/water> [accessed April 29, 2002].

aquifers are the preferred sources of drinking water, because slow filtration through the aquitard helps to purge the groundwater of potential pathogens.[2]

Limestone underlies most of Southern Ontario. Where the cracks and fault planes in the limestone have been enlarged by the dissolution of the limestone, the resulting geology is called karst. The channels thus created allow a rapid underground flow of water, so that rather than seeping slowly through aquifers, water may move considerable distances in a short time. It is difficult to predict the pathways that may be taken by groundwater in such systems, although scientists are getting better at modelling them.[3] While the rate of groundwater flow generally measures centimetres or even millimetres per day in non-karst systems, water can travel very rapidly through karstic limestone, with ranges of up to hundreds of metres per day.

Groundwater and surface water are interconnected. Water may flow from surface sources into aquifers in one area, and then re-emerge into surface water in another. In some cases, the direction of water flow between surface water and groundwater depends on the time of year. Groundwater contributes to surface water bodies during periods of low water, while the flow is in the opposite direction during periods of high water.

4.2.2 Water Availability and Use in Ontario

The issue of water quantity in Ontario merits some discussion. Concerns about water quantity and the potential impacts of climate change were expressed by several parties and members of the public during this Inquiry. It was pointed out that although it is often said that Canada has more fresh water per capita than just about any other country, such statements usually refer to the gross stocks of water rather than the annual net runoff. A pattern of water use that exceeds annual net runoff is often compared to dipping into capital instead of living on interest. There is no question that when it comes to water resources, sustainability must be a cornerstone of public health.

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[2] K. Howard, testimony, Walkerton Inquiry (Part 1 Hearing, October 16, 2000), transcript pp. 24–28.

[3] E.O. Frind, D.L. Rudolph, and J.W. Molson, 2001, "The case for groundwater protection in Ontario: Results of the workshop held at the University of Waterloo, May 1, 2001 – A contribution to the Walkerton Inquiry, Phase II," Waterloo, Ontario, pp. 16–19.

Ontario is certainly one of the world's favoured places with respect to the quantity of water available. Its stock of old water includes groundwater sources created millions of years ago. The annual precipitation in Ontario ranges from a low of approximately 650 mm in the Hudson Bay watershed to a high of 850 mm in the Lake Superior and Lake Huron watersheds. Some of this water cycles directly back into the air through evapotranspiration, but this leaves a staggering average runoff of approximately 12,000 cubic metres per second (m^3/s). Moreover, this amount of runoff is relatively reliable: in only 1 year in 20 is it statistically expected to be less than 7,910 cubic metres per second.

A small portion of net precipitation seeps into the ground to replace water that is extracted and consumed. Even though most of Southern Ontario is underlain by carbonate rock with a great capacity for holding water, groundwater movement is generally slow and the aquifers may not be in hydraulic connection with each other. There is therefore a danger of overtaxing local groundwater resources.

4.2.2.1 *Consumptive Use Compared with Non-consumptive Use*

A small proportion of water is used consumptively – that is, without returning it to the local ecosystem following use. Water lost to evapotranspiration during use, or water that is sequestered in products or exported, is said to have been consumed. In contrast, water is returned to the ecosystem following non-consumptive use. Non-consumptive uses include most of the water that is used for drinking, in industry, or for hydroelectric generation.

In fact, most activities result in some combination of consumptive and non-consumptive use. Irrigation is an example of a highly consumptive use of water – over 70% of the water is lost to evapotranspiration. On the other hand, activities like hydroelectric generation are over 99% non-consumptive.[4]

Comparing consumptive use in Ontario to total runoff shows that, in total, Ontarians consume very little of what is reliably and sustainably available. They are far from dipping into capital, according to the data in one of the

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[4] International Joint Commission, 2000, *Protection of the Waters of the Great Lakes: Final Report to the Governments of Canada and the United States* <www.ijc.org/boards/cde/finalreport/finalreport.html> [accessed March 26, 2001].

papers commissioned for the Inquiry.[5] Much less than 1% of the average annual runoff is consumed in most of Ontario, and just under 1% (or 1.25% of reliable runoff) is consumed in the Great Lakes basin. The paper's forecasts indicate that these figures might increase to around 1.3% of the average (or 1.7% of the reliable) annual runoff in the Great Lakes basin by 2021. On the other hand, the total intake of water (which may include some double counting, because water is reused as it moves through a watershed) in 1996 was approximately 38% of the reliable annual runoff, and may rise to over 50% by 2021. These data are summarized in Table 4.1.

4.2.3 Water and Climate Change

A number of parties at the Inquiry suggested that climate change may become a significant factor in the provision of safe drinking water in the future. The report of a workshop organized in 2000 by the Soil and Water Conservation Society, the International Institute for Sustainable Development, and the Canadian Water Resources Association indicates that this may be the case.[6] The report synthesizes much of the work that has been done on the regional impacts of climate change in Canada. It suggests that Ontario may expect to see increased overall annual precipitation, with reduced snow and increased rainfall, more dramatic weather events, a greater degree of surface runoff and flooding, and less infiltration. At the same time, increased temperatures are expected to create increased evaporation, more than offsetting the increase in precipitation and resulting in a lowering of water levels in the lakes. Lower surface water levels, greater runoff, and greater evaporation could also substantially reduce the rate of recharge of groundwater.

Such changes, if they occur, will have long-term impacts on the quality and quantity of drinking water sources in Ontario.

My mandate is to make recommendations regarding the safety of drinking water and does not extend to long-term conservation or ecological management issues. However, a number of the recommendations I make below also provide

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[5] D.M. Tate, 2002, "Water quantity and related issues: A brief overview," Walkerton Inquiry Commissioned Paper 22.

[6] Global Change Strategies International Inc. and Meteorological Service of Canada, 2000, *Water Sector: Vulnerability and Adaptation to Climate Change, Final Report* <www.c-ciarn.ca/Waterresources_jimbrucereport.pdf> [accessed April 4, 2002].

Table 4.1 Water flow and use in Ontario[7]

1996 Actual	Average Runoff (m^3/sec)	Reliable Runoff (m^3/sec)	Intake (m^3/sec)	Consumed (m^3/sec)	Consumed (% average)	Consumed (% reliable)	Intake (% average)	Intake (% reliable)
Hudson-James Bay	6000	3730						
Winnipeg	760	380						
Great Lakes	3070	2400	940	30	0.98	1.25	30.62	39.17
Ottawa	1990	1390						
Total	**11810**	**7910**	**1030**	**40**	**0.34**	**0.51**	**8.72**	**13.02**

2001 Trend Line Projection	Average Runoff (m^3/sec)	Reliable Runoff (m^3/sec)	Intake (m^3/sec)	Consumed (m^3/sec)	Consumed (% average)	Consumed (% reliable)	Intake (% average)	Intake (% reliable)
Hudson-James Bay	6000	3730						
Winnipeg	760	380						
Great Lakes	3070	2400	1000	30	0.98	1.25	32.57	41.67
Ottawa	1990	1390						
Total	**11810**	**7910**	**1100**	**40**	**0.34**	**0.51**	**9.31**	**13.91**

2021 Trend Line Projection	Average Runoff (m^3/sec)	Reliable Runoff (m^3/sec)	Intake (m^3/sec)	Consumed (m^3/sec)	Consumed (% average)	Consumed (% reliable)	Intake (% average)	Intake (% reliable)
Hudson-James Bay	6000	3730						
Winnipeg	760	380						
Great Lakes	3070	2400	1360	40	1.30	1.67	44.30	56.67
Ottawa	1990	1390						
Total	**11810**	**7910**	**1500**	**40**	**0.34**	**0.51**	**12.70**	**18.96**

[7] Modified from Tate.

tools for adaptive management on a wider basis. In particular, the "approaches to adaptation" of the climate change report that will be well supported in the recommendations of this Inquiry are as follows:

- "[p]reparing water budgets for watersheds to identify the connections between surface and groundwater, areas of vulnerability to water takings and to determine limits for water extraction";
- "[i]mproving contingency plans for extreme events";
- "[e]ncouraging best management practices in rural areas to reduce sources of pollution"; and
- "[e]ncouraging community-based environmental stewardship."[8]

4.2.4 Conclusion

For the purposes of providing drinking water to its population, Ontario has little reason for immediate concern about the gross quantity of water available. On the other hand, a large portion of that water (a volume equal to approximately 39% of the available runoff in the Great Lakes basin)[9] is at some point appropriated for human use. This amount is already large, given the amount of water in the province, and it is likely to increase substantially, to over 50% of the reliable annual runoff by 2021.

Although the vast majority of the water used by humans is returned to the ecosystem, its condition may be considerably worse than when it was withdrawn, depending on what it was used for and what sort of treatment was applied before it was returned. With such a large amount of water being returned to watersheds, which are sources of drinking water for users downstream, it is critical to ensure that all sources are protected from undue contamination.

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[8] Ibid., pp. 67–68.
[9] See Table 4.1.

4.3 Drinking Water Source Protection

4.3.1 Overview

In a multiple-barrier system for providing safe drinking water, the selection and protection of reliable, high-quality drinking water sources is the first barrier.

A strong source protection program offers a wide variety of benefits. It lowers risk cost-effectively, because keeping contaminants out of drinking water sources is an efficient way of keeping them out of drinking water. This is particularly so because some contaminants are not effectively removed by using standard treatment methods. As a result, protecting drinking water sources can in some instances be less expensive than treating contaminated water. Moreover, protecting sources is the only type of protection available to some consumers – at present, many rural residents drink untreated groundwater from wells. The protection of those groundwater sources is the only barrier in their drinking water systems.

It is clear that the public strongly favours source protection as a key component of our water system. No other aspect of the task of ensuring drinking water safety received as much attention during the town hall meetings this Inquiry held across Ontario. Source protection was also one of the main issues identified by the Part 2 parties in the Inquiry. The parties addressed the issue in their submissions, at the expert meetings, and in the public hearings that were held from May through September of 2001.[10]

In this chapter, I recommend a source protection system that begins with a strong planning component. I also recommend that source protection planning must be carried out on an ecologically meaningful scale – that is, at the watershed level.

Because drinking water source protection is one aspect of the broader subject of watershed management, it makes the most sense in the context of an overall watershed management plan. In this report, I restrict my recommendations to those aspects of watershed management that I think are necessary to protect drinking water sources. However, I want to emphasize that a comprehensive

[10] As I mentioned above, these submissions can be found on the Commission's Web site.

approach is needed and should be adopted by the Province. Source protection plans should be a subset of broader watershed management plans.

Some of the main elements of the source protection system I envision are as follows:

Leadership from the Ministry of the Environment (MOE): I recommend that the MOE be the lead provincial agency with regard to all aspects of providing safe drinking water, including source protection. The MOE would establish the framework for developing watershed-based source water protection plans, would help to fund and participate in their development, and would approve the completed plans.

A watershed basis: The watershed is the most meaningful unit for drinking water source protection planning. Impacts on water resources are integrated within watersheds, not municipalities. Residents of a watershed have a common interest in water quality, regardless of political boundaries.

A local planning process: To ensure that local considerations are fully taken into account, and to develop goodwill within and acceptance by the local communities, source protection planning should be done as much as possible at a local (watershed) level, by those who will be most directly affected (municipalities and other affected local groups). Where possible, conservation authorities should coordinate the plans' local development. Otherwise, the MOE itself should undertake the coordination role. I envision the process as being completely open to public scrutiny.

Approval by the MOE: Once draft plans are developed at the watershed level, I envision that they would then be subject to MOE approval. Requiring approval will provide consistency of approach across watersheds and should help prevent undue influence by local interests.

Effective plans: If source protection plans are to be meaningful, they must be respected by the various actors in the watershed. Once the MOE has approved a plan, therefore, provincial Permits to Take Water and Certificates of Approval for sewage treatment plants and

> any other activities that pose a threat to water quality will have to be consistent with the approved plan. In cases involving a significant direct threat to drinking water sources, municipal official plans and zoning decisions will also need to be consistent with the local source protection plans. In all other situations, municipal official plans and zoning decisions should at least take the relevant source protection plans into account.

Those who have experience in watershed planning will find these recommendations familiar. They quite closely reflect the watershed planning process developed in 1993 by the MOE, the Ministry of Natural Resources, the conservation authorities, and other groups[11] and are consistent with the regimes for source protection and watershed management that exist in many other jurisdictions.

The legislation discussed in Chapter 2 of this report and other provincial policies provide many of the tools needed to ensure the safety of Ontario's drinking water sources. However, the system as currently structured is a patchwork that lacks a clear mandate, leadership, consistency, and coordination for the protection of drinking water sources.

The need for a coordinated, integrated approach to managing water resources is acknowledged in some of the documents the Inquiry obtained from the provincial government.[12] Importantly, even before the Walkerton tragedy, the government was beginning to move in the direction of establishing a

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[11] Ontario, Ministry of the Environment and Energy and Ministry of Natural Resources (MOEE/MNR), 1993a, *Watershed Management on a Watershed Basis: Implementing an Ecosystem Approach* (Toronto: Queen's Printer); Ontario, Ministry of the Environment and Energy and Ministry of Natural Resources (MOEE/MNR), 1993b, *Subwatershed Management* (Toronto: Queen's Printer); Ontario, Ministry of the Environment and Energy and Ministry of Natural Resources (MOEE/MNR), 1993c, *Integrating Water Management Objectives into Municipal Planning Documents* (Toronto: Queen's Printer).

[12] The annual reports published by the Environmental Commissioner of Ontario from 1994 to 2001 discuss a recommendation that the Ministries of Environment and Energy, Natural Resources, Consumer and Business Services (formerly Consumer and Commercial Relations), Agriculture, Food and Rural Affairs, and Transportation work together to upgrade Ontario's groundwater management framework. See also Ontario Water Directors' Committee, 1999, "Policy water management: Strategic policy direction & 5-year business plan," September, submitted to Assistant Deputy Ministers; Ontario, Ministry of the Environment and Ministry of Natural Resources, 2000, "Provincial water management framework," February, submitted to the Management Board.

comprehensive water management framework for Ontario. A report prepared for the MOE by Valerie Gibbons in 2001 also supports calls for more integrated management.[13] The background paper on watershed management prepared for the Gibbons Report[14] identified best practices in watershed management that closely reflect many of the recommendations contained in this chapter.

A more integrated approach, as proposed below, is necessary to protect the quality of Ontario's drinking water sources. Protecting water resources for the purpose of maintaining or improving the quality of drinking water sources must be a primary focus of strategic planning for water at the provincial level.

4.3.2 Source Protection Plans

Recommendation 1: Drinking water sources should be protected by developing watershed-based source protection plans. Source protection plans should be required for all watersheds in Ontario.

In Chapter 13 of this report I recommend a comprehensive provincial policy for drinking water that will include a multiple-barrier system for the protection of drinking water safety. Source protection is the first barrier in that system.

Drinking water organizations around the world are increasingly recognizing the need to manage the drinking water system as a whole, including protecting sources. The American Water Works Association (AWWA), for instance, has provided a series of "white papers" on the importance of source water protection as part of a multiple-barrier system.[15] In Australia, where an extensive process of development and consultation has resulted in the production of a new set of guidelines, the need for water quality planning to extend all the way from the catchment to the consumer has been emphasized.[16]

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[13] Executive Resource Group, 2001, *Managing the Environment: A Review of Best Practices* (Brampton, ON), vol. 1, pp. 23–27. Available at <www.ene.gov.on.ca/envision/ergreport> [accessed April 29, 2002] [hereafter Gibbons Report].

[14] Beak International Incorporated, 2001, "A review of watershed management experience," in *Ibid* vol. 2.

[15] See appendices in B. Pett, for OWWA/OMWA, 2001, "The management of manure and non-point source contamination of water quality in Ontario: Review of the Walkerton Inquiry Issue #6 reports by Goss and Johns," Walkerton Inquiry Submission.

[16] L. Gammie, for OWWA/OMWA, 2001, "Review of Issue #5 – Drinking water standards – in the Krewski et al. report 'Managing health risks from drinking water,'" Walkerton Inquiry Submission, pp. 23–25.

Most of the Part 2 parties emphasized the need for strong source protection measures. None disagreed. Many emphasized not only the importance of source protection in reducing health risks, but also the cost-effectiveness of protection as a means of keeping pathogens out of drinking water.

As part of this Inquiry, town hall meetings were held at locations around Ontario. In each city or town that we visited, I met with municipal water services staff and managers. In every case, the importance of having secure drinking water sources was brought home to me. At the town hall meetings, Ontarians from many communities voiced their concern about the protection of drinking water sources. The commissioner of engineering and public works for the Region of Waterloo said that "[s]ource water protection is … the first and probably most cost-effective barrier in a multiple barrier or integrated approach."[17] The president of the Lake Kasshabog Residents' Association said that "[t]he future safety of drinking water in the Province is inextricably tied to the care that we take in managing the integrity of these sources."[18] The general manager of the City of Toronto Water and Waste-Water Facilities said that "[t]he protection of our drinking water sources … is the most critical issue facing us today."[19] Ontario's Environmental Commissioner has also emphasized the need for source protection: "The true protection for all our drinking water … lies upstream of the treatment plant."[20]

Protecting our drinking water sources must be a key part of the system for ensuring the safety of Ontario's drinking water.

The key to source protection is managing the human activities that affect drinking water sources. At present in Ontario, the main approach to managing these activities is the permit-based regulation of water takings and effluents from human activities, combined with voluntary programs for the control of non–point source pollution.[21] This approach is largely "end-of-pipe" and has

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[17] M. Murray, Walkerton Inquiry (Kitchener-Waterloo Town Hall Meeting, March 22, 2001), transcript p. 17.
[18] T. Rees, Walkerton Inquiry (Peterborough Town Hall Meeting, April 10, 2001), transcript p. 124.
[19] M. Price, Walkerton Inquiry (Toronto Town Hall Meeting, October 29, 2001), transcript p. 11.
[20] G. Miller, Environmental Commissioner of Ontario, 2001, speech given at the Safe and Clean Drinking Water Strategies Conference, Toronto, Ontario, July 10.
[21] Sources of contaminants can generally be grouped into two classes. *Point sources* are identifiable fixed single points where contaminants are released, such as a municipal sewage outflow pipe. *Non-point sources* involve contaminants that are released from multiple or dispersed locations, such as the spreading of road salt or runoff from agricultural land.

been criticized for being applied on a serial, project-by-project basis, resulting in a failure to regulate the cumulative impacts of water use in a watershed.

A systematic land use planning approach that protects drinking water sources, including strategies like wellhead protection legislation, the mapping of groundwater aquifers, and other land use controls, is used in many other jurisdictions, including New Brunswick, Nova Scotia, and most of Europe. In Ontario, some municipalities have created bylaws to control land use for the purpose of protecting drinking water sources on an ad hoc basis, with some assistance and encouragement from the provincial government. It has been suggested, however, that the tools available to municipalities are not sufficient to allow the development of a consistent and systematic source protection plan. Moreover, as I discuss in section 4.4.5.5, municipal authority is restricted in regulating agricultural activities (which are often a source of pathogenic contamination) if the activity constitutes a normal farm practice.[22]

A watershed consists of all of the lands that drain into a particular body of water. This may be a large body of water (e.g., the Lake Ontario watershed, the Great Lakes watershed, the Ottawa River watershed) or a small one (the Lake George watershed, the Tay River watershed). Watersheds may be nested: for example, the Grand River watershed is within the Lake Erie watershed. In fact, nearly every watershed is contained within some other watershed. For practical purposes, it is often useful to define a certain major watershed and then refer to subwatersheds within it.

Watersheds are an ecologically practical unit for managing water. This is the level at which impacts to water resources are integrated, and individual impacts that might not be significant in and of themselves combine to create cumulative stresses that may become evident on a watershed level.[23]

Managing water on a watershed basis requires decision makers to recognize the impacts that upstream activities have on downstream water sources and helps ensure that decision makers take all impacts into account. Management units like municipalities or individual sites are too small to encourage decision makers to take a whole-system view when managing water and allow them to ignore the costs that are incurred outside their jurisdictions. Such externalization results

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[22] *Farming and Food Production Protection Act, 1998*, S.O. 1998, c. 1, s. 6.

[23] Ontario, MOEE/MNR, 1993a, p. 5; Conservation Ontario, 2001, "The importance of watershed management in protecting Ontario's drinking water supplies," Walkerton Inquiry Submission, p. 14; Beak International, p. 1.

in a skewing of what planners may regard as the most cost-effective choices and hinders the sensible management of the resource.[24]

Using the watershed as the appropriate level for planning also helps to balance two competing needs: the need for local decision making and the need for a reasonable consistency of approach between localities. I think this balance can be reached by ensuring that affected groups in the watershed develop drinking water source protection plans on a watershed basis in accordance with provincially established guidelines.

The Government of Ontario, conservation authorities, and various other groups have developed a watershed planning framework that is already applied in some watersheds.[25] This may be an excellent framework for environmental management on a watershed basis, but it is optional and, importantly for this report, drinking water and the safety of drinking water sources have not received sufficient attention within this framework.

For this recommendation, I suggest that the provincial government accept the watersheds as they are currently defined for the purposes of establishing the jurisdiction of the conservation authorities. These jurisdictions have the advantage of already being in place, and they have worked well in the past. There has been no serious suggestion that watersheds should be reidentified for the purpose of the planning process I am recommending. Below, I recommend that where possible, the conservation authorities coordinate the development of watershed-based source protection plans. It therefore makes sense to adopt the jurisdictional areas within which the conservation authorities now operate for the purposes of source protection planning. Where there is no conservation authority, the MOE should define the geographic extent of the watersheds for planning purposes.

In recommending that the provincial government adopt watersheds for planning purposes, I recognize that groundwater aquifers may be located in more than one watershed. In such instances, there will be a need to coordinate the planning process among the watersheds.

The various aspects of water management cannot be separated, because the water involved is used and reused as it passes through watersheds. Several of

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[24] Ontario, MOEE/MNR, 1993a, pp. 3–4.
[25] Ibid.

the Part 2 parties suggested that the MOE should be responsible for developing a comprehensive water management strategy that would address all aspects of water management on a watershed basis. As I have already said, it would be very difficult to develop a meaningful and useful drinking water source protection regime without a broader strategy. The recommendations I make in this chapter assume that a broader system will be in place.

It is apparent from many of the documents made available to the Inquiry that the provincial government, led by the Ministry of Natural Resources and the MOE, has been taking steps toward developing an integrated provincial water strategy.[26] The impetus for this work appears to have been successive years of low precipitation in the late 1990s and a recognition of the need to plan for low-water conditions.

However, the Province has focused on protecting water resources on the basis of the resources' ecological and recreational values, not on the basis of the critical public health goal of maintaining secure water supplies for public consumption. This focus may be due to the relatively low priority given to drinking water within the MOE in the past and the view that municipal drinking water was not a core program of the ministry.[27] The safety of Ontario's drinking water will be greatly enhanced if maintaining safe and secure drinking water supplies is a core goal of the MOE. If the ministry chooses to approach drinking water source protection as part of a larger system of watershed management, the requirements of safe drinking water should be the central focus. I do not suggest that the protection of drinking water sources will in all cases take precedence over other uses; many factors will have to be considered and balanced. However, the protection of drinking water sources should be the primary concern for achieving the balance in a particular watershed.

4.3.3 The Role of the Ministry of the Environment

There are a number of reasons why the province must take the leadership role in developing the source protection planning process and ensuring that the process is adequately funded.

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[26] Ontario Water Directors' Committee; Ontario, MOE/MNR, 2000.

[27] I discussed this issue in the Part 1 report. See Ontario, Ministry of the Attorney General, 2002, *Report of the Walkerton Inquiry, Part 1: The Events of May 2000 and Related Issues* (Toronto: Queen's Printer), p. 272.

The process for developing watershed-based source protection plans that will be elaborated below will be locally driven. However, the product of the process (i.e., the plan), once approved by the MOE, will be binding on provincial decisions to issue Permits to Take Water and Certificates of Approval for the discharge of contaminants. The Province is the more senior level of government and cannot fairly be bound by a process in which it has not played the lead role.

Furthermore, there is a need to ensure a level of consistency among source protection plans from different watersheds, along with a need to ensure that source protection planning is carried out thoroughly and fairly. The provincial government is in the best position to achieve these goals.

Finally, ensuring that source protection is done well is a key part of the whole system of overseeing drinking water management. The Province has the ultimate responsibility for the safety of drinking water. It only makes sense that the provincial government would therefore assume the ultimate responsibility for the first critical step in the process.

Within the provincial government, the lead agency for source protection planning should be the MOE. Water source protection is closely related to other environmental objectives. This ministry already has the responsibility for overseeing both environmental regulation and the management of drinking water in Ontario. It also has a mandate to use a watershed approach to environmental management.[28] That mandate has been reinforced by the Gibbons Report.[29] Moreover, the MOE has more expertise relating to matters involved in protecting drinking water sources than do other provincial government ministries.

Taking the lead role will mean that the MOE should be responsible for the development of the watershed-based source protection framework, should participate in the development of the plans (either by working with a conservation authority or by taking on the initiative itself), and should be the final approving body for the draft plans. In Chapter 13, I recommend that the MOE establish a new Branch, the Watershed Management Branch, to carry out these functions.

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[28] Watershed Planning Implementation Project Management Committee (WPIPMC), 1997, *An Evaluation of Watershed Management in Ontario* <www.ene.gov.on.ca/envision/techdocs/3513e.pdf> [accessed May 1, 2002], p. 18.

[29] Executive Resource Group.

4.3.4 Conservation Authorities

Recommendation 2: The Ministry of the Environment should ensure that draft source protection plans are prepared through an inclusive process of local consultation. Where appropriate, this process should be managed by conservation authorities.

The development of plans intended to protect drinking water sources is, among other things, a land use planning activity. Most land use planning is currently done at the municipal level (under provincial guidance), and the provision of drinking water is a primarily municipal function. However, as noted in section 4.3.2, source protection must be undertaken on a watershed basis – the level at which cumulative impacts on the drinking water sources become apparent. This implies the need for a planning body to operate at the watershed level, but with the full participation of the municipalities in the watershed. Such entities already exist for the watersheds that contain over 90% of Ontario's population: they are the conservation authorities (see Figure 4.1).

The role of conservation authorities in Ontario is to act as planning, coordination, and management agencies on behalf of the municipalities within a watershed. From their inception, conservation authorities have had the legislative mandate to control water levels for domestic and municipal purposes.

The first organization identifiable as a conservation authority in Ontario was established following a series of flooding events on the Grand River. The 1932 Finlayson Report, commissioned after the worst of those floods in 1929, identified the health consequences of low flow in the river and recommended the construction of a series of reservoirs. Responding to the report, the provincial government passed legislation enabling the affected municipalities to establish the Grand River Conservation Commission (GRCC) to undertake the work. The GRCC was to control the water levels of the Grand River "to ensure [a] sufficient supply of water for municipal, domestic, and manufacturing purposes."[30]

The current *Conservation Authorities Act* states the purpose of conservation authorities very broadly:

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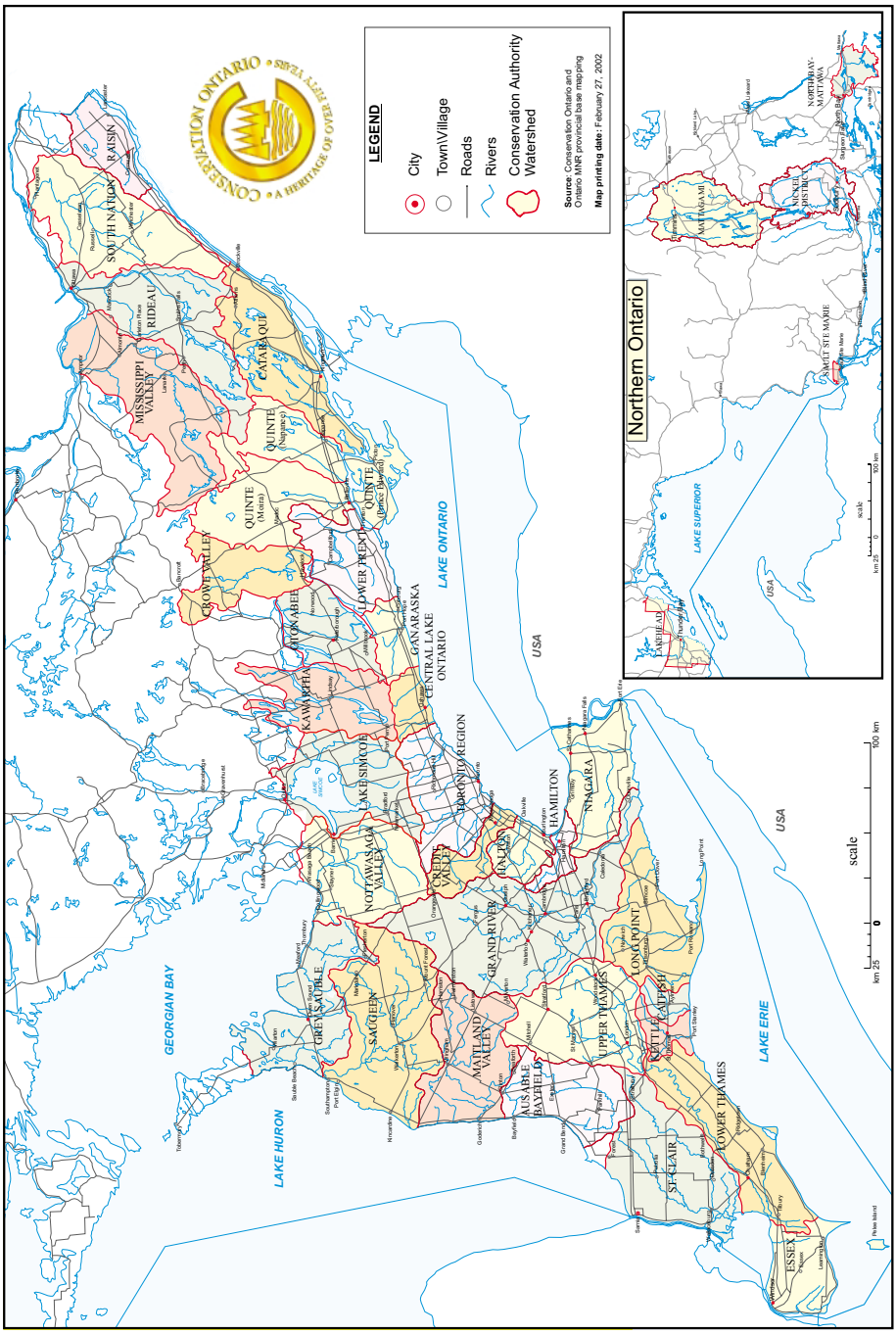
[30] Conservation Ontario, p. 8.

Figure 4.1 Ontario's Conservation Authorities



Map courtesy of Conservation Ontario

> The objects of an authority are to establish and undertake, in the area over which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals.[31]

Section 21 of the Act gives conservation authorities broad powers to carry out that mandate. Those powers include the authority necessary to develop watershed management plans and source protection plans.

The board of directors of a conservation authority consists of representatives of the authority's constituent municipalities. I have considered the possibility of recommending broadening the representation on conservation authority boards to include representatives of the MOE, Ministry of Natural Resources, or other affected groups. However, in my view, the boards of the conservation authorities should remain as currently constituted. Source protection planning will be only part of a conservation authority's responsibilities, and I am concerned that changing the representation on the board of directors without a thorough canvassing of everything conservation authorities do could compromise a conservation authority's other roles. As discussed below, those who have a specific interest in source protection planning can be adequately involved in ways other than serving on the board of directors of a conservation authority.

Many of the Part 2 parties recommended that conservation authorities have a central role in developing watershed-based source protection plans. However, a few parties were concerned that this approach could lead to inconsistency in the application of source protection in different watersheds. I am satisfied that this concern can be adequately addressed by extensive provincial government involvement in the development of the framework and process for watershed-based source protection planning, as well as in the development of the draft plans themselves, together with the requirement for final MOE approval of draft plans.

Conservation authorities are well positioned to manage the development of draft watershed-based source protection plans. They have the mandate and, in many cases, the experience and the respect of affected local groups that will be required to coordinate the development of the plans. Conservation authorities

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[31] *Conservation Authorities Act*, R.S.O. 1990, c. C.27, s. 20(1).

will also be the appropriate bodies to integrate a broader program of watershed planning if and when such a program is implemented.[32]

I received one submission suggesting that rather than relying on the conservation authorities for source protection, river basin (or catchment) management authorities should be established to manage and regulate source protection and other regulatory aspects of drinking water provision on a watershed basis.[33] It was suggested that these bodies would also have authority for land use planning and for granting permits and licences. The number of drinking water providers in the province would be reduced to match the number and geographic extent of the catchment management authorities. This proposal was based on experiences in Europe and Great Britain. One of the principal advantages of the new authorities, it was argued, would be a greater independence from municipalities. Without such independence, it is feared, improper political influence could adversely affect the process of promoting drinking water safety.

I am not convinced that such a radical change in the governance of water and water systems is necessary. Many conservation authorities are tested, publicly respected, and accepted organizations that can build on a significant amount of goodwill in their communities and among affected local groups to facilitate source protection planning. I am reluctant to recommend the creation of new bodies when existing institutions are able to fulfill the role. If the source protection planning process receives appropriate guidance, participation, and approval from the MOE, I do not believe that there is a significant risk that municipalities will exert undue influence on the process. Moreover, I am recommending that the planning process not only include affected parties, but also be completely transparent to the public. I believe that public scrutiny affords significant protection against unreasonable behaviour. Given that the province will ultimately have to approve all source protection plans, I think there will be sufficient safeguards to address the concern that the local political actors would be able to impose unreasonable requirements on the planning process.

I recognize that the river basin model used in Europe provides a high level of coherence between source protection planning, environmental regulation, and the operation of water systems. However, I am satisfied that by involving water

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[32] The 1993 MOEE/MNR papers on watershed management also recommended that conservation authorities take charge of the broader program of watershed planning (see Ontario, MOEE/MNR, 1993a, p. 28).

[33] M. Price, Walkerton Inquiry (Toronto Town Hall Meeting, October 29, 2001), transcript p. 15.

providers in source protection planning and by requiring the approval of watershed plans by the MOE, which is also the regulator of water systems and other environmental issues, the system I propose can also achieve this coherence.

Finally, there is a real benefit that flows from the fact that the conservation authorities are primarily representative of the municipalities. It is the municipalities that have the responsibility for land use planning. Watershed-based source protection planning will have a direct impact on land use planning. It is therefore essential that the municipalities be significantly involved in the source protection planning process so that their concerns may be considered and addressed and so that the resulting plans will enjoy greater acceptance. I am satisfied that where conservation authorities exist and have the necessary capacity, they are the organizations best positioned to bring about effective source protection planning.

I recognize that conservation authorities around the province are currently involved in a wide range of different functions and have reached varying degrees of sophistication. Some simply provide flood control in river basins, whereas others are leaders in detailed watershed management planning. It would be very difficult for some conservation authorities to take on the additional responsibilities proposed by this recommendation without a major increase in capacity and some time for development. It is up to the MOE to evaluate the ability of each conservation authority to undertake the watershed-based source protection plan development. I support capacity-building among conservation authorities, and the MOE should provide assistance in this area. However, as a practical matter, the MOE itself may need to take on the task of developing the draft watershed-based source protection plans for some watersheds.

The MOE will also have to take on the task of managing the development of draft plans in areas where there is no conservation authority. A substantial portion of the province (containing about 10% of the population) is not covered by a conservation authority. It is possible that planning will not be as complex in areas that are more remote and less densely populated than those served by conservation authorities, but nonetheless there are significant land uses, such as forestry or mining, that may have an impact on drinking water sources in those areas. It is also important to note that due to the more rural nature of these areas, many people will be using untreated individual domestic water supplies, thus increasing the importance of protecting those sources.

If a conservation authority does not produce a plan acceptable to the MOE within a prescribed time limit, the MOE should take over development of the plan. Indeed, the prospect of having the MOE step in to develop the plan when the local participants are unable to do so should serve as a significant incentive to those involved in the local planning process to reach consensus. The important point, however, is that there must be an alternative process if the local process fails to develop an acceptable plan. The MOE must provide that alternative process.

The process that applies to source protection planning should be the same whether plans are developed by a conservation authority or the MOE: there should be consultation with affected local groups, plans developed by the MOE should have the same effect as plans developed under the leadership of conservation authorities, and plans should be periodically reviewed and revised if necessary.

4.3.5 Watershed-based Source Protection Plans

4.3.5.1 *The Framework*

The provincial government should consult with conservation authorities, municipalities, environmental groups, and other affected groups to develop a provincial framework for source protection planning, including guidelines for the form, content, and the development process.

In section 4.3.5.2, I list what I consider to be many of the important elements of a watershed-based source protection plan. The Province should cooperate with the organizations that will be affected, and with those that have experience in watershed planning, to develop this framework. The Grand River Conservation Authority has received global recognition for its efforts in watershed planning, and I suggest that its model, combined with the model provided in the 1993 watershed planning framework, may be a good starting point. It will be important, however, to leave sufficient flexibility to ensure that processes and plans can be adapted to local circumstances.

The framework should include both an "ingredients list" for source protection plans and guidance on the appropriate process for plan development. This second item is very important, because the binding nature of the plans will

require that all of those who are affected feel that they have been fairly involved in developing the plans.

The development of this framework should not be used as a reason to delay the implementation of watershed-based source protection planning. Excellent watershed planning models already exist in Ontario, and in my opinion adapting them to suit this purpose would not be an overly onerous task. I encourage the MOE to try to establish the framework within six to eight months after the release of this report. Further modifications or adaptations can be made as the process is implemented and as the participants learn from their experiences.

4.3.5.2 *Components of Plans*

At a minimum, watershed-based source protection plans should include the following:

- a water budget for the watershed, or a plan for developing a water budget where sufficient data are not yet available;
- the identification of all significant water withdrawals, including municipal intakes;
- land use maps for the watershed;
- the identification of wellhead areas;
- maps of areas of groundwater vulnerability that include characteristics such as depth to bedrock, depth to water table, the extent of aquifers, and recharge rates;
- the identification of all major point and non–point sources of contaminants in the watershed;
- a model that describes the fate of pollutants in the watershed;
- a program for identifying and properly decommissioning abandoned wells, excavations, quarries, and other shortcuts that can introduce contaminants into aquifers;

- the identification of areas where a significant direct threat exists to the safety of drinking water (in such cases, municipal official plans and zoning decisions must be consistent with the plan); and

- the identification of significant knowledge gaps and or research needs to help target monitoring efforts.

The objective of all this data collection and modelling should be the development of an adaptive model of risks to water sources. Such a model would indicate those areas where specific measures should be taken to protect drinking water sources. Importantly, different levels or types of required protection could be designated for different areas.

A number of Part 2 parties identified the need to undertake research on various topics, including the value of protecting wetlands and near-shore (riparian) areas in maintaining the quality of drinking water sources and the economic benefits of source protection. Such research should be integrated into the watershed-based source protection planning process and should be supported by all interested parties. Where data are not available to complete components of the plan listed above, research should make filling such gaps a priority.

Based on the vulnerability mapping, source protection plans should designate land use zones in which particular source protection measures are (or are not) needed and determine acceptable ranges of water allocations among competing uses. They should also provide operational limits concerning acceptable levels of water withdrawals and total contaminant loadings that will be considered and not exceeded by the MOE when considering applications for Permits to Take Water or Certificates of Approval for water-related contaminant releases.

Water use allocation as part of the watershed-based source protection plan deserves some further explanation, because in some areas local shortages may make this a significant issue. In section 4.3.9, I recommend that Permits to Take Water (PTTW) and Certificates of Approval for pollutant releases granted by the MOE should be consistent with source protection plans. Where it is shown through the planning process that the demand for PTTW or Certificates of Approval may exceed available supply or the system's assimilative capacity (i.e., its ability to absorb pollutants), all those desiring or holding PTTW or Certificates of Approval should participate in a corollary process that should attempt to negotiate a mutually acceptable agreement concerning water use or contaminant release allocation. If such an agreement can be produced and is

acceptable to the MOE, then PTTW and Certificates of Approval granted by the MOE should follow the agreement. If the participants cannot agree on allocations, the MOE should itself determine the distribution of rights. Under neither of these circumstances should the total amount of water allocated or the total loading of pollutants under the combined PTTW or Certificates of Approval exceed the amount of water sustainably available or the system's assimilative capacity according to the watershed-based source protection plan.

I envision that the planning process would identify areas where the protected measures for drinking water sources are critical to public health and safety, and that in such cases, the plan would govern municipal land use and zoning decisions. However, other measures in the plan need not require such rigidity in the municipal decision-making process. In such instances, municipalities will be required only to have regard for the plan but will make the ultimate decision regarding how to balance the competing factors. Given that municipalities themselves will be centrally involved in the source protection planning process, I think this approach strikes a reasonable balance.

4.3.5.3 *Groundwater Management*

It is essential that watershed-based source protection planning address the management and protection of groundwater sources. Most of Ontario's population lives in large cities served by drinking water from surface water sources (in particular, the Great Lakes). However, almost 50% of smaller municipal systems use groundwater as their source. Once groundwater becomes contaminated, clean-up can be expensive and technically challenging, if it is possible at all.

Research needed to produce the information required for groundwater management has ebbed and flowed over the years. In the latter part of the 1960s and the early 1970s, Canada and Ontario were recognized as world leaders in groundwater-related research through the work of the Geological Survey of Canada and the Ontario Geological Survey. By 1987, the federal Pearce Commission report suggested that only modest attention was being paid to groundwater.[34] According to experts today, there is not enough information about groundwater resources in Ontario to manage them

[34] Canada, Environment Canada, 1985, *Currents of Change, Final Report: Inquiry on Federal Water Policy* (Ottawa: Environment Canada), p. 122.

properly.[35] Furthermore, the Environmental Commissioner of Ontario has found that the Ministry of the Environment often grants PTTW without making an adequate assessment of the capacity of the resource and without basing decisions on an ecosystem approach. In a 2001 report, he concluded that Ontario lacks a comprehensive framework for groundwater management.[36]

Models do exist that can (when sufficient data are available) predict groundwater movement and allow for the development of good groundwater protection strategies.[37] Indeed, in some areas where groundwater has been the traditional source of municipal drinking water, most of the needed data are available.[38]

The MOE has taken some action on this issue. In 2000, the Minister of the Environment announced a cooperative program for groundwater monitoring with Conservation Ontario, and this program has begun.[39] In January 2002, the minister announced a $10 million program to map Ontario's aquifers as a means of providing much-needed information for the protection of drinking water resources.[40] It will be critical for such efforts to contribute to a broader system of source protection planning that takes a watershed approach and acknowledges the interconnection among various water sources.

4.3.6 Participation of Affected Groups and the Public

The involvement of a broad range of affected groups in the watershed-based source protection planning process will be key to its success. The process must be seen to be broadly and fairly inclusive of the interests that will be affected. The province should involve affected groups not only to ensure the fairness of

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[35] K. Howard, testimony, Walkerton Inquiry (Part 1 Hearing, October 16, 2001), transcript pp. 103–104; Frind, Rudolph, and Molson, pp. 10–13.

[36] Environmental Commissioner of Ontario, *Ontario's Permit to Take Water Program and the Protection of Ontario's Water Resources*: *Brief to the Walkerton Inquiry* <www.eco.on.ca/english/publicat/walker01.pdf> [accessed April 29, 2002] pp. i–ii.

[37] Frind, Rudolph, and Molson, pp. 16–19. However, there is room for advancement, and our understanding of groundwater transport in karstic systems like those underlying much of Ontario is improving. Policies for groundwater protection must therefore be sufficiently flexible to accommodate future improvements in our models.

[38] For example, in the Region of Waterloo extensive groundwater modelling has been undertaken and used to create groundwater protection strategies.

[39] Ontario, Minister of the Environment, 2000, *Ontario Launches Groundwater Monitoring Network* <www.ene.gov.on.ca/envision/news/0075.htm> [accessed April 30, 2002].

[40] Ontario, Minister of the Environment, 2001, *Ontario Flows $10 Million to Communities for Groundwater Studies* <www.ene.gov.on.ca/envision/news/11401.htm> [accessed April 30, 2002].

the process, but more importantly to improve it. Involving a broad cross-section of water users in the planning process will both help to ensure that all issues are considered in the planning process and bring new perspectives into the process. Affected groups and the interested public have played an essential role in this Inquiry. They have provided insights and have greatly assisted in my understanding of the issues. I am certain that watershed-based source protection planning can benefit from the same type of experience and expertise that was available to me.

The conservation authority or the MOE – whichever body is coordinating the draft plans' development – should ensure that a committee consisting of affected local groups is convened. That committee should be responsible for developing the draft watershed-based source protection plan.

A key group of participants in developing the plans will be the municipalities. Although they are represented on the conservation authorities' boards of directors, they should also take an active role in the committees that develop the plans. This role could be undertaken by water system managers or elected officials. Involving both managers and officials would ensure that the municipality is represented in both of the two main capacities in which it may be affected by source protection planning: as the water provider, and as the level of government responsible for land use zoning and setting municipal bylaws in accordance with the *Planning Act* and the *Municipal Act.* In both of these capacities, municipalities have a significant interest in source protection planning.

Some Ontario municipalities draw water from watersheds other than the ones in which they are located. These municipalities should participate in watershed-based source protection planning committees in both watersheds.

The development of watershed plans should also take place in consultation with the MOE, other ministries (Agriculture, Food and Rural Affairs; Municipal Affairs and Housing; Natural Resources; Consumer and Business Services), non-governmental organizations, and other affected groups, including local public health officials. I also encourage the federal government to participate where appropriate; particularly relevant will be representatives of Fisheries and Oceans Canada, Environment Canada, Indian and Northern Affairs Canada, and Agriculture and Agri-Food Canada. The participation of federal agencies will help ensure intergovernmental coordination in an area where constitutional jurisdiction is not always clear.

It is also highly desirable to include First Nations in watershed planning working groups where appropriate. Water does not recognize the boundaries of First Nations reserves.

Although the form of consultation may vary to accommodate local circumstances, the need for it is clear. As a general rule, consultation should err on the side of inclusion, both regarding which parties are consulted and regarding the level of involvement in the process. Consultation should never be pro forma; it should be meaningful and substantial. Interested parties must be given adequate time and information to ensure that their views are fully canvassed and considered.

Without extensive consultation, watershed plans are likely to suffer from a lack of commitment from affected groups and are less likely to be successful. Conservation authorities that have undertaken this type of planning exercise have found that when all of the affected parties gather to determine a management model, a sense of fairness tends to take hold, and solutions are created that are acceptable to all participants.

To ensure that the benefits of a variety of perspectives are brought to bear on the planning process, the Province, where appropriate, should make funding available to help public interest groups participate.

To ensure that the process is and is seen to be fair, complete, and reasonable, and as a means of discouraging any undue influence, the source protection planning process should be fully transparent to the public. Draft plans and proposals should be widely published. Meetings of the planning committee, including affected groups, should be open to public attendance – although not necessarily full public participation, which might make meetings unwieldy. Planning committees should at least invite public comment in writing at some point in the process. The MOE's decisions concerning the approval of draft watershed-based source protection plans should be subject to the requirements of the *Environmental Bill of Rights, 1993*.[41]

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[41] *Environmental Bill of Rights*, 1993, S.O. 1993, c. 28.

4.3.7 The Ministry of the Environment's Provision of Information and Technical Assistance to Conservation Authorities

The development of watershed-based source protection plans will involve the collection and assimilation of large quantities of data. Unfortunately, watershed managers find it difficult at times to obtain from the MOE baseline information that would be helpful in their activities.[42]

The MOE is a repository of much of the key information required for watershed-based source protection planning (e.g., well drilling records). It should ensure that the information it maintains is freely available to those engaged in the planning process. The planning will be an MOE initiative that will be developed through local committees, and those committees will require access to MOE data. This collaboration should go both ways, because often the local source protection planners will be the ones collecting new data on behalf of the MOE.

I am aware that the MOE, in collaboration with related ministries, is developing information management systems and capabilities (through the Land Information Ontario initiative) in ways that will allow the collection of large volumes of standardized information for dissemination through the Internet. This is a very helpful initiative.

The MOE should also maintain a capacity for technical support for watershed-based source protection planning. This would include capabilities in geographic information systems, ecological monitoring and modelling, and other decision support tools. This technical capacity should also be available to the agencies undertaking source protection planning. Assistance will be particularly important for smaller and less well-developed conservation authorities.

4.3.8 The Approval of Watershed-based Source Protection Plans

Recommendation 3: Draft source protection plans should be reviewed by the Ministry of the Environment and subject to ministry approval.

The development of draft source protection plans will be a province-wide initiative that will often be carried out by local entities. There will be a need to ensure a degree of consistency across Ontario. Therefore, each draft plan, once

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[42] WPIPMC, p. 14.

completed, should be submitted to the MOE for review. The MOE should review the draft plan for conformity with the framework and should also review the process that was used in developing the plan to ensure that all affected groups were fairly consulted. The MOE may return the plan with a request for revisions. When the plan is satisfactory, it should be approved.

The MOE's approvals process must be transparent and flexible. If the MOE chooses to reject a watershed-based source protection plan or a portion of a plan, it must do so for clearly and publicly stated reasons.

Some Part 2 parties expressed a concern about requiring MOE approval. It was argued that the watershed planning process has been so successful in some watersheds because it is essentially driven by the affected groups, and acceptance of the process occurs because it is a local initiative. There is some worry that too much MOE involvement or oversight might compromise some of the goodwill in the process. While I understand this concern, I do not think that requiring MOE approval will interfere with the goodwill that arises from developing plans locally. The plan, if approved, will still have local origins. In addition, the need to obtain MOE approval should be an incentive to reach reasonable compromise at the local level, and the prospect of having the MOE develop a plan if the affected local groups fail to reach consensus should inspire reasonable approaches.

Another concern about requiring MOE approval relates to the time involved. These plans are intended to evolve through a process of ongoing review and adaptation. This process is already slowed by the need to consult various affected groups during the planning process. Adding the additional step of a potentially lengthy provincial government approval could result in greater delay and considerable time spent using out-of-date plans. However, these plans will be reviewed and approved by the proposed Watershed Management Branch of the MOE. With proper staff and resources, I see no reason why the MOE, which will have participated in the plan's development, could not complete its review within no more than three months of receiving the plan. I do not think that delays of this order outweigh the substantial benefits of requiring provincial government approval of the plans.

4.3.9 The Implementation of the Plans

Recommendation 4: Provincial government decisions that affect the quality of drinking water sources must be consistent with approved source protection plans.

Watershed-based source protection plans will have implications for many different kinds of land users. The provincial government must also be bound by the plans if those plans are to be effective, because some of its decisions, such as the issuance of PTTW and Certificates of Approval for discharges, may have significant effects on drinking water sources. No Permits to Take Water or Certificates of Approval should therefore be granted for activities that would exceed the limits set by or otherwise violate the provisions of the relevant watershed-based source protection plan. The source protection plans should designate any other types of provincial decisions where consistency is required.

This approach will force a consideration of the cumulative ecological impacts of all actions in the watershed before a PTTW or Certificate of Approval is granted, rather than allowing such permits or certificates to be granted strictly on the basis of the individual application.

It will also answer the concerns of the many Part 2 parties who stated that a new approach to the granting of PPTW is needed. Their criticism was that the current approach does not sufficiently involve affected local groups in the decision and does not embrace an ecosystem approach. I agree that these are valid concerns and think that the best approach will be to make the granting of provincial PTTW and Certificates of Approval subject to the wider source protection plan, which includes a watershed approach to managing water sources.

The Energy Probe Research Foundation took this approach one step further by asking me to make the following recommendation:

> No one should have the right to contaminate a source of water. Farmers, industrial polluters, and sewage treatment plant owners should be responsible for ensuring that their wastes do not impair the quality of water. Criminal and tort liability should apply.[43]

[43] Energy Probe Research Foundation, 2001a, "Energy Probe Research Foundation's recommendations for Public Hearing No. 1: Guiding principles and the role of government," Walkerton Inquiry Submission, p. 1.

In my view, this recommendation is too broad and would affect matters that go beyond my mandate. It would represent a significant shift in the way water resources on the whole are managed in Ontario. I am satisfied that requiring that PTTW and Certificates of Approval conform with drinking water source protection plans is the way to protect drinking water sources while at the same time recognizing the need for certain land use activities that could have a negative effect on water. I do not think it advisable that the courts be the first recourse for determining what land use activities could constitute a threat to the safety of drinking water and should therefore not be permitted. Others with special expertise and familiarity with the local circumstances are more suited to make decisions of this nature.

Recommendation 5: Where the potential exists for a significant direct threat to drinking water sources, municipal official plans and decisions must be consistent with the applicable source protection plan. Otherwise, municipal official plans and decisions should have regard to the source protection plan. The plans should designate areas where consistency is required.

One of the key aspects of watershed-based source protection plans is that they must influence land use patterns if they are to be successful. It might therefore seem desirable to recommend categorically that municipal official plans and decisions should be consistent with all aspects of watershed-based source protection plans. This type of approach was supported by several Part 2 parties. Making such a change would confer enormous authority on the watershed-based source protection planning process to constrain municipal decision making. In a way this would be a self-imposed constraint, since conservation authorities are essentially composed of municipalities and since municipalities will be involved in the source protection planning process. However, conservation authorities are not the bodies with the ultimate authority for land use decisions; municipalities are. In my view, the planning process that I envision should intrude on the municipal authority over land use decisions only to the extent that is necessary to ensure the safety of drinking water and therefore the protection of public health.

There is a history of debate over whether municipal land use plans should be required either to "have regard to" or to "be consistent with" provincial policy statements. This same issue also arises when it comes to the question of how watershed-based source protection plans should affect municipal plans. Some elements of source protection may be more important than others, and there

are legitimate planning considerations other than the quality of water. It is important that municipal policy-makers be allowed to make municipal policy, but the protection of drinking water sources should be an important priority. In my view, an acceptable approach is that municipal plans and actions must have regard to the watershed-based source protection plan unless the plan itself stipulates that municipal plans or actions must be consistent with it. The requirement for consistency would be triggered in areas where it is determined that there is a potential for a significant direct threat to drinking water sources. Thus, watershed-based source protection plans may indicate portions of the plan for which municipal plans and bylaws must either "be consistent with" or "have regard to" the watershed-based source protection plan. Allowing the watershed-based source protection planning committee members these options promotes greater flexibility and will, I believe, encourage a more proactive approach to planning. I am concerned that requiring all municipal plans and bylaws to be consistent with watershed-based source protection plans might be a disincentive to incorporating certain protective features in the plan. In the end, I take comfort from the fact that the provincial government approval of plans is required.

In section 4.3.15, I discuss the need for a provincial review of all the Acts, regulations, and policies relating to the issue of source protection. That review should provide recommendations regarding the statutory changes required to create the recommended relationship between watershed-based source protection planning and municipal planning. However, in the meantime, municipalities themselves should strive to ensure that their municipal plans are consistent with source protection plans where indicated.

Municipal sewage, storm-sewer, and combined-sewer effluents must also be consistent with the watershed plan. This will eventually be controlled through MOE Certificates of Approval, but in the meantime municipalities should monitor contaminant levels in their effluents, especially where those effluents might have an impact on downstream drinking water sources.

Under certain circumstances, it may be desirable for a municipality to grant a variance from a municipal plan that is contrary to a "be consistent with" portion of a watershed-based source protection plan. For such a variance to be granted, approval from the municipality and the MOE should be required. It would obviously make sense for the conservation authorities to be consulted about the advisability of a variance. Precedent for this type of arrangement can be found in the procedure for granting a variance from flood-plain zoning controls.

Such variances should be time limited and should be terminated if the land use is changed.

4.3.10 The Review of the Plans

Some aspects of the watershed-based source protection plans will require constant updating to reflect changing circumstances. One component of those plans should therefore be the identification of significant knowledge gaps and a plan for developing knowledge in those areas. The monitoring component of watershed-based source protection should ensure that new data are collected and used to continuously refine watershed models. These improvements must be integrated into the plan through a full and fair process. Original affected groups and new participants should be convened periodically to review and revise the plan as necessary, using a process that is defined by the MOE in cooperation with the affected groups and is similar to the one used to develop the plan.

The MOE should review and approve the revised plan, at which point it should replace the original plan.

4.3.11 Appeals

Recommendation 6: The provincial government should provide for limited rights of appeal to challenge source protection plans, and provincial and municipal decisions that are inconsistent with the plans.

There should be a narrow right of appeal for watershed-based source protection plans. I am concerned that appeals should not become commonplace and, in effect, emerge as the main forum for resolving planning issues. The right to appeal should be restricted to parties who are directly affected and should be limited to failure of a plan to conform to provincial guidelines or failure to follow the proper process in developing a plan.

There should also be provisions for appealing provincial decisions, such as the issuance of PTTWs and Certificates of Approval, or municipal decisions that are related to the source protection plans, on the basis that such decisions do not conform to the relevant plan. In the case of all such appeals, I think that

the principle of administrative deference should apply and there should be provision for summary dismissal.

4.3.12 Funding Watershed Management

Recommendation 7: The provincial government should ensure that sufficient funds are available to complete the planning and adoption of source protection plans.

In considering the funding of source protection planning, three main options offer themselves. The Province or the municipalities could provide public funds, water consumers could pay through user fees, or those who discharge pollutants could pay fees when issued a Certificate of Approval. No option appears to be perfect, and I favour a combination of funding mechanisms to pay for the source protection planning process.

There is a strong argument in favour of provincial funding, on the basis of fairness. A successful watershed-based source protection planning system will provide side benefits to water users generally, including the enhancement of recreational opportunities (e.g., fishing, swimming, canoeing); stable access for rural, domestic, and industrial users; and environmental and other benefits.

The assignment (for the purposes of calculating fees) of economic benefits for a resource that lends itself to many simultaneous non-consumptive beneficial uses, as well as other uses that are only partly consumptive, is difficult. It would therefore be hard to establish a system for assigning fair portions of the cost to all users, let alone collecting those fair portions. Furthermore, if one limits the fees to PTTW or Certificates of Approval, a user-fee approach will not reach all users. Those not captured under the *Ontario Water Resources Act* or under some other environmental approvals system (for Certificates of Approval for pollution sources) will not have to bear the cost, nor will other water users (e.g., swimmers, fishers, naturalists), although they may be significant beneficiaries.

On the other hand, the proposition that source protection planning should be paid for exclusively out of provincial coffers runs contrary to the user-pay

concept. It therefore seems reasonable that at least some component of the funding for source water protection should come from municipal water rates.[44]

What is clear is that watershed-based source protection planning need not be terribly expensive. The Province's review of watershed planning (which I have already observed is an analogous and highly overlapping process) notes that the cost of watershed planning pilot projects appeared to be between $160,000 and $420,000.[45] It is clear that watershed-based source protection plans cannot be developed and maintained without stable funding. As a result, I recommend that some portion of the necessary funding come from user fees. In addition, some portion of the cost should be raised by those to whom Certificates of Approval are issued for discharging pollutants. Finally, the province should contribute from general revenues a portion of the necessary cost and ensure that its portion of the funding is available on a continuous and sustainable basis. However funding is allocated among the three sources, the province should ensure that the necessary funding is in fact made available for this vitally important exercise.

4.3.13 Public Reporting

During the Inquiry, several suggestions were made regarding which organizations should be responsible for providing public reporting about source protection. One recommendation was that there should be annual or biannual provincial reports on source water protection, with a response from the various agencies involved. Another was that drinking water providers should be obliged to "assess and periodically review the vulnerability of their sources of drinking water to current or future contamination or degradation, and publicly report upon the results of such assessments."[46] Another possibility would be to ensure that

[44] A joint statement by Conservation Ontario, Ontario Water Works Association/Ontario Municipal Water Association, Ontario Sewage and Watermain Construction Association, and Strategic Alternatives at the Walkerton Inquiry Expert Meeting on Financing Drinking Water Systems included these principles: "Some of the costs of source protection must be recovered from water users, including private and large commercial users as well as municipalities, and from effluent discharges thus capturing the 'polluter pays' concept. The Province needs to establish policy and tools for this to happen … Standards or guidelines from the Province are needed to guide what relevant source protection costs can be linked to drinking water supply and sewage management. A structure is needed to determine where revenues should come from and what programs to support."

[45] WPIPMC, p. 11.

[46] Concerned Walkerton Citizens and Canadian Environmental Law Association, 2001, "Tragedy on tap: Why Ontario needs a *Safe Drinking Water Act*," executive summary, Walkerton Inquiry Submission, p. 7.

the conservation authority or the MOE (whichever body is organizing the watershed-based source protection plan in a given area) should be obliged to produce annual reports.

It seems to me that there should be a role for reporting at each of these levels. However, the overarching responsibility for source protection belongs to the provincial government. The Province should provide an annual summary indicating the status of drinking water source protection plans in each watershed.

The planning itself may be coordinated on a local basis by a conservation authority or the MOE. That local authority should ensure that local source protection plans are widely available. Since these plans will be evolving, the local authority should also provide regular progress reports.

4.3.14 Education

Recommendation 8: Conservation authorities (or, in their absence, the Ministry of the Environment) should be responsible for implementing local initiatives to educate landowners, industry, and the public about the requirements and importance of drinking water source protection.

Education is a key component of a good source protection strategy. People need to understand the value of the resource and the reasons for restrictions on various types of activities. The conservation authorities (or the MOE, in their absence), as the centre of the watershed-based source protection planning effort in the watershed, will have the best access to the information resources needed for this effort. Furthermore, most conservation authorities have already taken on extensive public education roles, to which this component can be added if it is not already being delivered.

4.3.15 Legislative Review

Implementing a province-wide watershed-based source protection planning strategy may require changes to provincial legislation. Conservation Ontario, the Association of Municipalities of Ontario, and the Ontario Public Service Employees Union have all emphasized the need for changes to the *Planning Act* to enable municipalities to undertake source protection. I do note, however, that the *Planning Act* provides broad powers to the Province to affect planning

through the Provincial Policy Statement. I also note that section 34 of the Act allows municipalities to control land uses in any area "that is a sensitive ground water recharge area or head-water area or on land that contains a sensitive aquifer," and section 23 provides the Minister of Municipal Affairs and Housing with the ability to require changes to municipal plans if they affect a "provincial interest" such as the one identified in section 2(e): "the supply, efficient use and conservation of … water." It may be possible to develop a comprehensive watershed-based source protection planning system under current legislation.

In Chapter 13 of this report, I suggest that the province should review current legislation to ensure that the tools needed for implementing the watershed-based source protection regime recommended in this chapter are available.

4.3.16 The Value of Water

It has been suggested that the provincial government should charge water users for the resource – that is, assign a value to water. The principal justification for doing this would be to "reflect its scarcity"[47] and to encourage conservation – appropriate economic behaviour in the face of a scarce resource. However, I am not convinced that this is a necessary step for ensuring the safety of Ontario's drinking water. Water "used" for drinking is mostly returned to the ecosystem, and as such is not "consumed." It must be treated to acceptable standards before it is returned, and that cost is paid through sewage rates. To the extent that the water is being "used," the user is paying for treatment. Only a small proportion is lost to evapotranspiration or export.

On the other hand, it is clear that price signals can have a significant impact on water consumption. Some studies have shown up to a 40% reduction in household water use when meters and volumetric pricing (i.e., pricing based on the amount of water used, rather than a flat fee) are introduced in communities. Reducing consumption may be a key strategy in managing a municipal water system, and using price may be the best approach for doing so. It is open now for water providers to price water to include a conservation charge. I therefore see no need to make any specific recommendation in this regard.

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[47] Energy Probe Research Foundation, 2001b, "Energy Probe Research Foundation's recommendations for Public Hearing No. 4: Source protection," Walkerton Inquiry Submission, p. 3.

4.3.17 The Enforcement of Environmental Laws and Regulations

Environmental regulations and conditions on provincial approvals must be consistently and strictly enforced.[48] During the Inquiry, I heard that the MOE's approach to enforcing conditions on Certificates of Approval, Permits to Take Water, and other environmental regulations has been subject to substantial changes from time to time, depending in part on the policies of the government of the day. In the 1990s, the MOE's tendency was to employ "voluntary compliance" techniques rather than to prosecute environmental violators.

The MOE should issue a clear statement, internally and externally, that water pollution must be tightly controlled. This means enforcing the provisions of the *Environmental Protection Act*, the *Ontario Water Resources Act* (or the *Safe Drinking Water Act* when it is ready), and the *Fisheries Act* (in collaboration with the Ministry of Natural Resources and the federal Department of Fisheries and Oceans), as well as enforcing the conditions of Certificates of Approval and Permits to Take Water. There should also be a strong statement that offending municipalities will be prosecuted, just as any other violator would be. I do not propose a "zero tolerance" policy of immediately moving to prosecute after any exceedance, but I do recommend that the enforcement tools available to the MOE be used much more readily than they have been used in the past.

Such a policy, supported by appropriate funds, should immediately help to protect the sources of drinking water. Moreover, the source water protection regime I have proposed cannot work in the absence of enforced rules concerning land uses, effluent qualities, Certificates of Approval, and Permits to Take Water.

This recommendation runs slightly counter to the Gibbons Report, which recommends an increased focus on cooperative approaches to environmental compliance.[49] As I discussed in Chapter 2 of this report, I do not mean to impugn that recommendation. I express no opinion on whether it may be appropriate for some environmental issues. However, when the environmental issue is the protection of drinking water sources, the concern is not about environmental impacts but about public health. There is little room for

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[48] I provide greater detail on the notion of strict enforcement as it applies to drinking water in general in Chapter 13 of this report.
[49] Executive Resource Group, pp. 28–32.

negotiating voluntary compliance arrangements when public health is threatened.

Several of the Part 2 parties made extensive recommendations concerning the need for citizen enforcement of environmental regulations. I address the issue of public enforcement in Chapter 13 of this report.

4.4 Specific Threats

4.4.1 Introduction

What I have described so far in this chapter is a broad approach for developing watershed-based source protection plans. During the Inquiry, many issues regarding the regulation of particular contaminant sources were identified by commissioned paper authors, Part 2 parties, and participants in town hall meetings. This section provides recommendations concerning those issues. In general, I make recommendations on the assumption that the broader source protection plans are already in place. These recommendations can be seen as fitting into the nested approach to source protection at the site level.[50]

This section devotes more attention to regulating contaminants from agricultural sources than to regulating those from any other source. This emphasis is not intended to suggest that agricultural sources are more dangerous than any other sources. It simply reflects the difficulty of dealing with non–point source pollutants in general and with agricultural sources in particular. Agriculture represents one of the most intimate relationships that exists between humans and the rest of the natural world, and it is impossible to expect that it can be carried out without creating changes in the environment. But agriculture is also a source of contaminants that sometimes appear in drinking water, and those must be controlled.

4.4.2 Human Waste

Municipal sewage treatment plants may be significant point sources of a wide range of water contaminants. The amounts and types of contaminants released by such sources depend on the type of treatment, as is described in Chapter 6

[50] Ontario, MOEE/MNR, 1993a.

in this report. As the major outlets for human waste into the environment, sewage treatment plants may contribute substantial loadings of human pathogens.

An application for a Certificate of Approval for a sewage works must provide information about the concentration and volume of the effluent and about the volume and flow rate of the receiving waters.

The adequacy of Certificates of Approval for protecting drinking water sources from contaminants arising from point sources depends on the conditions attached to the certificates. Certificates should include conditions that ensure that effluents must be consistent with source protection plans. The enforcement of those provisions should be strict. One matter that concerns me is that in more than 60% of the cases in Ontario,[51] the Inquiry's examination of sewage treatment was unable to determine whether sewage treatment plants were in compliance with regulations. Of the remaining 40%, approximately 15% were out of compliance. This information should be publicly available.

Municipalities may use bylaws to determine the types of chemicals that may be deposited by sewer users. Toronto has recently amended its sewage use bylaw to provide more stringent environmental controls. The bylaw is applied to ensure that substances deposited into the city's sewers meet certain requirements. For instance, the bylaw prohibits depositing fuels, dyes, PCBs, combustible liquids, hazardous wastes, waste disposal site leachate, and many other substances into sewers. It also limits the levels of other substances that may be present in materials released into the sewers and prohibits using dilution to remain within those limits. (It is possible for the city to accept prohibited wastes by agreement.) The bylaw also requires pollution prevention planning by industrial sewer users. It is intended to ensure that chemicals that are not treated by the treatment system or those that might impair the system's functioning are not deposited into the city's sewers. [52]

Perhaps less easily controlled is what goes into storm sewers. Urban runoff, through sewers or directly into streams and rivers, may contain a wide variety of substances. These complex mixtures, which may include various chemicals, pesticides, fuels and oils, salt, pathogens, and nutrients, can be very damaging

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[51] E. Doyle, 2002, "Wastewater collection and treatment," Walkerton Commissioned Paper 9, p. 10.
[52] City of Toronto, By-law No. 457-2000, *To regulate the discharge of sewage and land drainage* (July 6, 2000).

to the environment. Urban runoff can contribute to environmental loadings of contaminants that might cause problems in drinking water. It should therefore be taken into account in watershed-based source protection planning. Municipalities may wish to evaluate the possibility of using such technologies as constructed wetlands and stormwater retention tanks or ponds as means of containing or treating this kind of effluent. The province should support the efforts of municipalities and conservation authorities to educate people about the need to use sewers appropriately.

4.4.3 Septic Systems

Recommendation 9: Septic systems should be inspected as a condition for the transfer of a deed.

Throughout this Inquiry, I often heard about the problems related to groundwater contamination from inadequate or old and decrepit septic systems. The issue came up in expert meetings, public hearings, and town hall meetings. An alarming statistic that was often quoted is that approximately a third of septic systems are in compliance with the building code, a third are simply out of compliance, and a third could be characterized as a public health nuisance.[53]

Given these statistics, and considering that septic systems are generally located in rural areas, where groundwater is the principal source of drinking water, inadequate septic systems may present a substantial threat to some Ontario drinking water sources.

The Sewell Commission considered this problem at some length[54] and recommended that the MOE should ensure that regular inspections be carried out at the expense of septic tank owners. This conclusion was echoed in the paper prepared for this Inquiry by the Pembina Institute.[55] I support these

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[53] See, for instance, Commission on Planning and Development Reform in Ontario, 1993, *New Planning for Ontario: Final Report* (Toronto, Queen's Printer), p. 124 [hereafter Sewell Commission]. In 1998, the *Building Code Act, 1992*, S.O. 1992, c. 23, was amended to include the regulation of septic systems, and responsibility for septic systems was transferred from the Ministry of the Environment to the Ministry of Municipal Affairs and Housing. The authority for enforcing these new provisions was delegated to municipalities, with local health units and conservation authorities maintaining responsibility in certain Northern Ontario areas.

[54] Commission on Planning and Development Reform in Ontario, pp. 124–126.

[55] M.S. Winfield and H.J. Benevides, 2001, *Drinking Water Protection in Ontario: A Comparison of Direct and Alternative Delivery Models* (Ottawa: Pembina Institute for Appropriate Development).

conclusions, and recommend that as a minimum there should be mandatory inspection of septic tanks as a condition of the transfer of a deed. The owner of the septic system should pay for these inspections. Municipalities might also wish to consider requiring septic reinspection as a condition for the issuance of building permits.

Rather than making periodic inspections mandatory for all septic systems (an enormously expensive undertaking), I suggest that the watershed-based source protection planning process address areas of particular concern. In areas with a high density of septic systems, it may be desirable to include a proactive septic reinspection program as part of the implementation of the source protection plan. A program for the inspection of septic systems should prioritize those that are located in areas of high drinking water source vulnerability as identified in the source protection plan.

Many of the Part 2 parties expressed strong support for a program of mandatory septic system inspection and septic system owner education. The Ministry of Municipal Affairs and Housing does provide guidance for communities that wish to establish a septic system reinspection program.[56] The ministry points out that reinspection may lead to the need for enforcement but does not discuss enforcement strategies.

4.4.4 Biosolids and Septage

Recommendation 10: The Ministry of the Environment should not issue Certificates of Approval for the spreading of waste materials unless they are compatible with the applicable source protection plan.

Considerable attention was also given by the Part 2 parties at the Inquiry to the issue of the spreading of biosolids (treated solid municipal waste) and septage (untreated hauled waste – e.g., materials that have been pumped out of septic tanks) on rural land as fertilizer or in land-farming operations. There was some concern about the potential impacts on water resources, although much attention was also given to the impact on neighbours' property values and

[56] See Ontario, Ministry of Municipal Affairs and Housing, Housing Development and Buildings Branch, 2001, *Septic Systems Re-Inspections: Information for Enforcement Agencies and Others Interested in Local Septic System Re-Inspection Initiatives* <http://obc.mah.gov.on.ca/septic.htm/Septic_English_.pdf> [accessed May 7, 2002].

quality of life due to odours from the operations. These latter problems are well beyond the scope of my mandate.

In Ontario, a Certificate of Approval is required before biosolids or septage may be applied to agricultural land. In general, the application of waste must be likely to improve the quality of the soil and must not endanger the environment if it is to be approved. The document *Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land* outlines the rules for applying wastes to agricultural lands.[57] It states that septage must not generate odours that are worse than those generated by normal farm practices and must not contain pathogens in amounts higher than would be found in digested biosolids.[58] Certificates of Approval detail the maximum levels of various potential contaminants that may be contained in the applied waste.

Some of the Part 2 parties called for a ban on the application of untreated septage or asked for stricter standards regarding biosolids that are to be applied. The Environmental Commissioner of Ontario identified a number of serious problems with the management of biosolids and septage in his 2001 report.[59] Several of these shortcomings relate directly to the protection of potential drinking water sources:

- Nutrient management plans are not required before a Certificate of Approval is granted, with the result that septage or biosolids may be applied without anyone knowing the current nutrient load being applied to the area.

- There is no requirement to consider whether the land may be a water recharge area.

- There are no restrictions on spreading on tiled land,[60] which may drain rapidly to surface waters.

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[57] Ontario, Ministry of the Environment and Ministry of Agriculture, Food and Rural Affairs, 1996, *Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land*, <www.ene.gov.on.ca/envision/gp/3425e.pdf> [accessed April 29, 2002].

[58] Digestion is a biological process that can be used to reduce the concentrations of pathogens in biosolids.

[59] Environmental Commissioner of Ontario, 2001, *Having Regard: 2000/2001 Annual Report* <www.eco.ca/english/publicat/ar2000.pdf> [accessed April 29, 2002], p. 54.

[60] Tiling is a technique used to improve drainage on some farmlands.

- There is no prohibition against applying septage or biosolids to frozen soil, a practice that greatly increases the chances of runoff.

The Environmental Commissioner recommended that the "MOE and OMAFRA [the Ontario Ministry of Agriculture, Food and Rural Affairs] ensure that the new legislation and policies for sewage sludge and septage address the need for overall ecosystem protection, as well as protection of groundwater recharge areas."[61]

Those parties calling for an improved management regime may be encouraged to hear of a recent U.S. initiative to bring environmental management principles and continuous improvement into the handling and spreading of biosolids. The National Biosolids Partnership program is intended to ensure that biosolids are handled not only in accordance with U.S. Environmental Protection Agency (U.S. EPA) and state standards, but also in a "community-friendly" fashion.[62] The program includes public disclosure. OMAFRA and the MOE are undertaking a study aimed at determining whether to bring such a program to Ontario.

Some Part 2 parties suggested that information about the spreading of biosolids and other waste is not made available to affected persons in a timely fashion. In his 2001 report, the Environmental Commissioner of Ontario agreed, finding that the MOE provides "no opportunity for public consultation on approvals for land spreading of sewage sludge."[63] I think this situation is unfortunate.

I am satisfied that concerns about the impact on drinking water from the spreading of biosolids and septage can be adequately addressed by the source protection planning process that I am recommending. Spreading occurs only pursuant to a Certificate of Approval, and a certificate should be issued only if the proposed spreading is consistent with the area's watershed-based source protection plan. That plan, as I point out above, will assess and limit the cumulative impact of all loadings within the watershed. As I pointed out in section 4.3.17, enforcement of the conditions of Certificates of Approval must be strict.

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[61] Ibid., p. 56.
[62] U.S. Environmental Protection Agency, Office of Wastewater Management, 2002, *Biosolids* <www.epa.gov/owm/bio.htm> [accessed April 29, 2002].
[63] Environmental Commissioner of Ontario, 2001b, p. 53.

4.4.5 Agriculture

4.4.5.1 *Introduction*

Agriculture can be a significant source of the contaminants in drinking water. The U.S. EPA has found that the largest contributor of non–point source water pollution by volume in the United States is sediment runoff from agricultural sources.[64] Studies of rural wells in Ontario found that 34% contained elevated levels of coliform bacteria and 14% contained elevated levels of nitrates; both are indicators of agricultural contamination.[65] Moreover, at present in Ontario there is very little in the way of regulation directed to the protection of drinking water sources from the potential impacts of agriculture. For instance, there is no legally binding requirement concerning manure storage or management, nor is there an inspection program concerning manure management. There is considerably less environmental and water protection regulation of agriculture in Ontario than there is in many other Western jurisdictions.[66]

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[64] U.S. Environmental Protection Agency, 1995, *Progress Report* (Washington, DC: EPA), as cited in C.M. Johns, 2002, "Policy instruments to manage non–point source water pollution: Comparing the United States and Ontario," Walkerton Commissioned Paper 11, p. 11.

[65] M.J. Goss, D.A.J. Barry, and D.L. Rudolph, 1998, "Groundwater contamination in Ontario farm wells and its association with agriculture. 1. Results from drinking water wells," *Journal of Contaminant Hydrology*, vol. 32, p. 267, cited in M.J. Goss et al., 2002, "The management of manure in Ontario with respect to water quality," Walkerton Inquiry Commissioned Paper 6, p. 275.

[66] Ontario does not currently have the legally binding standards and regulations that address the environmental impacts of agricultural practices that exist in many other jurisdictions. Instead, the province has a series of position statements.

In the United States, the federal regulatory framework that governs water quality specifically addresses contamination from agricultural facilities. Agricultural nutrient regulation is achieved by federally set guidelines with a concurrent federal–state enforcement authority. In general, all states must adhere to U.S. EPA standards unless they develop more stringent water quality and manure management standards. State regulations typically apply to non–point sources of pollution, such as smaller agricultural operations.

In the European Union (EU), livestock waste disposal concerns have led to regulations that require producers either to use costly waste management techniques or to scale back production. The EU Nitrate Directive, enacted as a central regulatory act in 1991, sets a nitrate concentration limit for water and a limit on residual nitrogen after land applications of manure. Regions that do not meet this directive (which applies to all member countries) are subject to more stringent policies to bring about compliance, such as limits on livestock production and expansions for export markets. Some EU members, namely the Netherlands and Denmark, have regulatory instruments that tightly control various agricultural activities by way of nutrient management plans and fines or taxes on excess nutrients.

Other Canadian jurisdictions have also enacted regulatory mechanisms targeted at protecting water quality from agricultural impacts. In New Brunswick, municipalities can designate watersheds as protected areas; such a designation prevents new agricultural activity and restricts existing

A great deal of attention in Part 2 of the Inquiry focused on regulating the potential impacts of agriculture on Ontario's drinking water sources. My main recommendation is that every large or intensive farm, and every smaller farm located in an area designated as sensitive or high-risk, be required to develop a water protection plan that is consistent with the local watershed-based source protection plan (once the latter becomes available) and is binding on the farm's activities.[67]

The purpose of the plans will be to identify the ways in which the farming operation may affect drinking water sources, including those sources used by the farmers and their families, and to determine ways of preventing or reducing those impacts. Such water protection plans might logically be part of a broader nutrient management plan or environmental farm plan.

Farm water protection plans for all farms larger than a certain size and for all farms in areas designated as sensitive or high-risk by the watershed-based source protection planning system will require MOE approval. Compliance with these plans will be mandatory. Small farms that are not in sensitive or high-risk areas should nonetheless be encouraged to undertake water protection planning, possibly as part of an environmental farm plan.

In making recommendations concerning agriculture, I am seeking a balance between two needs that were repeatedly emphasized by the Part 2 parties during the Inquiry. Many of these parties emphasized the need to ensure that the regulation of the potential impacts of farming activities on drinking water sources is approached on a watershed or ecosystem basis. A simple regulation of individual farms that does not account for the cumulative effects of all the activities in a watershed is not sufficient. Making individual farm water protection plans consistent with watershed-based source protection plans will address this issue.

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agricultural practices. A Quebec regulation, specifically aimed at reducing pollution from agricultural sources, requires farmers to maintain an agro-environmental fertilization plan and document all manure spreading. The regulation also imposes restrictions on the time of manure application and the type of equipment used.

(See Goss et al.; 2002, Johns; and Environmental Commissioner of Ontario, 2002, *The Protection of Ontario's Groundwater and Intensive Farming: Special Report to the Legislative Assembly of Ontario* <www.eco.on.ca/english/newsrel/00jul27b.pdf> [accessed February 18, 2002].)

[67] When I refer to a "farm" in this report, I mean an agricultural operation as defined in the *Farming and Food Production Protection Act, 1998*, S.O. 1998, c. 1, s.1(1): "'agricultural operation' means an agricultural, aquacultural, horticultural or silvicultural operation that is carried on in the expectation of gain or reward." The Act further elaborates on the definition of a farm in s. 1(2).

On the other hand, various farm groups made the point that every farm is different and that even within a given farm, circumstances often change – different fields are left fallow or planted in different crops; herd sizes grow or are reduced – according to the farm's day-to-day management needs. A system is therefore needed that is able to recognize and accommodate each farm's individual circumstances. Thus, individual farm water protection plans must be consistent with protection of the watershed while at the same time recognizing the circumstances and practicalities of the particular farm involved.

4.4.5.2 *Farmers' Commitment to the Environment*

Ontario's farmers have generally demonstrated a strong commitment to the environment. Many have been certified under the environmental farm plan program (EFP) offered by the Province, Agriculture and Agri-Food Canada, and the Ontario Soil and Crop Improvement Association. The EFP appears to me to be an excellent program that helps educate farmers about the potential environmental impacts of all facets of their operations and encourages them to take appropriate actions. The plans are not compulsory, but a large number of farms have developed them with financial assistance from the Province.[68] The Ontario Federation of Agriculture (OFA) and other farmers' organizations suggested that the EFP may be threatened by funding cuts at the provincial level. I think such cuts would be most unfortunate. The farm groups also suggested that the EFP should be developed into a certifiable quality management program for farms. Although this may be a good idea, recommending such a program would address a broad array of environmental issues and would therefore be beyond the scope of this Inquiry. However, I do envision environmental farm plans as being the means by which water protection can be achieved for those small farms that are not in areas of the watershed that are designated as sensitive or high-risk. This may, in fact, be a large majority of the farms in some watersheds.

The Ontario Farm Environment Coalition (OFEC) also advocated using a "Contract with Consumers" to encourage good environmental performance among farmers in Ontario.[69] In such a "Contract," a farmer would promise to engage in a program of continuous environmental improvement in exchange

[68] A $1,500 grant has been available to assist the farmer in undertaking the environmental farm plan and subsequent improvements.

[69] Ontario Farm Environmental Coalition, "Ontario farmers' commitment to the natural environment," Walkerton Inquiry Submission, p. 17.

for funding from the Province. Although I find that there is much to recommend such an approach, possibly building on the environmental farm planning process, I do not think this solution goes far enough to protect drinking water sources in all cases.

4.4.5.3 *Ministry of the Environment Lead*

Recommendation 11: The Ministry of the Environment should take the lead role in regulating the potential impacts of farm activities on drinking water sources. The Ministry of Agriculture, Food and Rural Affairs should provide technical support to the Ministry of the Environment and should continue to advise farmers about the protection of drinking water sources.

I am recommending that a regulatory regime be established for agricultural operations. It is essential that a single ministry in the provincial government be responsible for developing and enforcing regulations. Of the two obvious candidates for regulating potential agricultural impacts on drinking water sources, I prefer the Ministry of the Environment (MOE).

Placing the MOE in charge of regulating potential agricultural impacts will centralize the protection of drinking water sources within one expert ministry. The recommendations in this report will result in the MOE's having the regulatory lead for all other aspects of drinking water management. The ministry already has the lead for other environmental regulation, including the regulation of pesticide use on farms.[70] I am concerned that allowing the continuing fragmentation of responsibilities for source protection – with most activities being carried out by the MOE, and those related to agriculture being carried out by OMAFRA – could lead to a lack of clarity about roles and accountabilities and could reduce the effectiveness of source protection enforcement. The farm groups expressed concern that the MOE does not have the expertise necessary to regulate agricultural activities, but the MOE should be able to call on OMAFRA to provide technical support when necessary.

The argument in favour of centralizing the regulation of agriculture in OMAFRA is that agriculture is significantly different from other types of industries and requires specialized knowledge on the part of the regulator.

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[70] *Pesticides Act*, R.S.O. 1990, c. P.11, s. 1.

Furthermore, OMAFRA has an established relationship with farmers and is likely to be seen as a supporter rather than as an aggressor in the agricultural community. Both these statements may be true. However, I am wary of the perception of a conflict of interest within OMAFRA, which could be seen to be simultaneously promoting the needs of the agriculture community and regulating that community. The possibility of such a perception has increased in the past few years, during which time OMAFRA has focused strongly on rural economic development and provided less attention to environmental protection. This development is reflected in the removal in 1998 of the statements concerning environmental protection from the ministry's statement of environmental values under the *Environmental Bill of Rights, 1993*, as noted by the Environmental Commissioner of Ontario.[71] Finally, while OMAFRA could be said to be expert in agricultural affairs, the MOE is expert in environmental regulation: it will be expert in the protection of drinking water generally and should have the most expertise in this area.

The MOE as the lead agency should work with OMAFRA, conservation authorities, and the agricultural community to develop an integrated approach to managing the potential impacts of agriculture on drinking water sources. This approach should include four separate elements: planning, education, financial incentives, and regulatory enforcement. Two papers prepared for the Inquiry suggest that a good policy would consist of a well-integrated combination of these four elements and would be sufficiently flexible to accommodate the different circumstances that may prevail on a number of scales (e.g., on the farm, in the watershed, in the municipality, or in the province).[72]

I agree with these authors and with the many submissions suggesting that the quality of drinking water sources should be protected from potential agricultural impacts through an integrated approach that uses all available tools. It is important that the actions of the different levels of government in this area be coordinated into a single coherent framework so as to avoid duplication and uncertainty.

Underpinning the integrated system for managing potential agricultural impacts on drinking water sources must be a strong regulatory system that will provide a minimum ("floor") level of performance that all operators must meet and

[71] Environmental Commissioner of Ontario, 1999, *Annual Report 1998: Open Doors* <www.eco.on.ca/english/publicat/ar1998.pdf> [accessed April 29, 2002], p. 33.
[72] Goss et al.; Johns.

that will set out the requirements of the participants. I lay this framework out in greater detail below.

4.4.5.4 *Regulatory Floor*

Recommendation 12: Where necessary, the Ministry of the Environment should establish minimum regulatory requirements for agricultural activities that generate impacts on drinking water sources.

Ontario's farmers have generally received direction from the provincial government in the form of guidelines rather than through regulation. For instance, there is currently no binding requirement for farmers to develop or follow nutrient management plans (although this situation may change under the proposed *Nutrient Management Act*). The Province has focused on a series of position statements and other Best Management Practices regarding nutrient management planning, manure storage and handling, and minimum distance separation that are intended to provide direction that is based on the best available technologies.

Some types of agricultural activities may constitute a threat to drinking water sources regardless of where they take place in a watershed. For example, manure storage and handling practices that do not follow guidelines for minimum distance separation from wellheads, or improper storage of large amounts of manure, may threaten drinking water anywhere. Such activities should be subject to province-wide regulation, not guidelines. This principle applies equally to those drinking water sources that serve those on the farms and those off. In particular, a minimum regulatory baseline or "floor" for manure storage and handling that will apply to all farms should be developed by the MOE, in consultation with OMAFRA, agricultural groups, and other affected groups.

Many jurisdictions that are in the forefront of addressing environmental issues have developed such minimum standards. In addition, I envision the possibility that watershed-based source protection plans may set out minimum standards for individual farm water protection plans in certain areas within the watershed. The point is that while flexibility and the customizing of individual farm water protection plans are important, there may be certain minimum standards that must apply to all farmers.

4.4.5.5 *Regulatory Review*

As a first step in ensuring a regulatory framework that is adequate to protect drinking water sources from potential impacts from agriculture, the MOE should review the existing regulatory framework in the light of this report.

In Part 2 of the Inquiry, much attention was focused on the exemptions granted to farms under the *Environmental Protection Act,* the immunity from nuisance actions afforded to farmers under the *Farming and Food Production Protection Act, 1998*, and the proposed *Nutrient Management Act*. In some cases, there appeared to be considerable misunderstanding about the scope of these Acts. I think it is useful to comment briefly on each of these statutes.

4.4.5.5.1 The *Environmental Protection Act*

I doubt that the exemptions granted under the *Environmental Protection Act* (EPA) protect farmers from prosecution for the pollution of water sources that causes or is likely to cause the adverse environmental effects referred to in definitions (b) to (h) of the definition of "adverse effect" in the EPA.[73] The protections provided to farmers appear to me to be much narrower than many of those who argue against them seem to understand.

Section 6 of the EPA states the following:

> (1) No person shall discharge into the natural environment any contaminant, and no person responsible for a source of contaminant shall permit the discharge into the natural environment of any contaminant from the source of contaminant, in an amount, concentration or level in excess of that prescribed by the regulations.
>
> Exception
>
> (2) Subsection (1) does not apply to animal wastes disposed of in accordance with normal farming practices.

This is a general prohibition that prevents exceedances of regulatory limits on contaminants. The exemption applies to animal wastes that are disposed of in accordance with normal farm practices, and it is very broad.

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[73] *Environmental Protection Act*, R.S.O. 1990, c. E-19, s. 1.

However, section 14 of the EPA creates a much narrower exemption for farming activities when they cause or are likely to cause any adverse effects:

> (1) Despite any other provision of this Act or the regulations, no person shall discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment *that causes or is likely to cause an adverse effect.* [emphasis added]
>
> Exception
>
> (2) Subsection (1) does not apply, in respect of an adverse effect referred to in clause (a) of the definition of "adverse effect" in subsection 1(1), to animal wastes disposed of in accordance with normal farming practices.

Section 14(1) is a special case provision of the EPA that prevents the discharge of contaminants if there is or is likely to be an adverse effect.

The exemption provided for the disposal of animal wastes here applies only to those adverse effects contained in paragraph (a) of the definition of adverse effects. The complete definition is as follows:

> 1. (1) In this Act,
>
> "adverse effect" means one or more of,
>
> (a) impairment of the quality of the natural environment for any use that can be made of it,
>
> (b) injury or damage to property or to plant or animal life,
>
> (c) harm or material discomfort to any person,
>
> (d) an adverse effect on the health of any person,
>
> (e) impairment of the safety of any person,
>
> (f) rendering any property or plant or animal life unfit for human use,

(g) loss of enjoyment of normal use of property, and

(h) interference with the normal conduct of business.

Although it is possible to fit any of definitions in paragraphs (b) through (h) into the definition in paragraph (a), there is a good argument that those adverse effects specifically set out in paragraphs (b) through (h) that are not referred to in the exemption in section 14(2) are caught by the prohibition in section 14(1). If this argument is correct, the MOE would be in a position to prosecute, when appropriate, for discharges causing or likely to cause the specific harms set out in paragraphs (b) through (h).

Since the EPA will form the backbone of the source protection regulatory system that I propose, the MOE should review this issue and, if necessary, seek to amend the Act to permit prosecution in appropriate cases where adverse effects occur. The MOE should also review its policies regarding the prosecution of agricultural operations under the EPA to ensure that the ministry is interpreting the legislation correctly and using it to its full extent to protect drinking water sources.

Moreover, there is no exemption provided to farmers from section 32 of the *Ontario Water Resources Act* (OWRA), the anti–water pollution statute. If, as I recommend in Chapter 13 of this report, the OWRA provision is to be removed, the MOE should make clear that farmers are not exempt from prosecution under section 14 of the EPA when adverse effects of the types described in paragraphs (b) through (h) of the EPA definition of adverse effect occur or are likely to occur. I emphasize that removing the OWRA provisions and leaving source protection issues to the EPA should not result in less protection for water sources.

4.4.5.5.2 The *Farming and Food Production Protection Act, 1998*

The *Farming and Food Production Protection Act, 1998* (FFPPA) does not create immunity for farmers from civil action relating to the contamination of drinking water. The question of civil liability for farmers is a difficult one. The preamble to the FFPPA provides as follows:

> It is in the provincial interest that in agricultural areas, agricultural uses and normal farm practices be promoted and protected in a way

> that balances the needs of the agricultural community with provincial health, safety and environmental concerns.[74]

This is a laudable objective. The Act then goes on to provide the following exemption for farmers:

> 2(1) A farmer is not liable in nuisance to any person for *a disturbance* resulting from an agricultural operation carried on as a normal farm practice.[75] [emphasis added]

A disturbance is defined as follows:

> "[D]isturbance" means odour, dust, flies, light, smoke, noise and vibration.[76]

This definition does not include the release of contaminants such as nutrients or pathogens. The exemption in section 2(1) therefore does not apply to the contamination of drinking water sources. Thus, a farmer could be civilly liable for a nuisance related to the contamination of drinking water, subject to the usual defences, including statutory approval.

There are no other immunities from civil action for farmers set out in the FFPPA.

4.4.5.5.3 The *Nutrient Management Act*

Many Part 2 parties commented on the proposed *Nutrient Management Act* (Bill 81). A number of possible deficiencies were identified that could be of consequence if the Act is intended to address the issue of protecting drinking water sources:

- Nutrient management planning does not necessarily entail a consideration of the presence of microbes such as bacteria, protozoa, and viruses, or of other non-nutrient constituents of manure (although the Act does not restrict the minister from considering these things when making regulations concerning the management and handling of nutrient-containing materials such as manure).

[74] *Farming and Food Production Protection Act, 1998*, S.O. 1998, c. 1.
[75] Ibid., s. 2(1).
[76] Ibid., s. 1(1).

- Nutrient management plans do not necessarily take into consideration watershed-specific information.

- In the past, nutrient management planning has focused more on maximizing crop yield than on protecting water resources.

- The *Nutrient Management Act* does not provide for enforcement by members of the public.

These points suggest that the *Nutrient Management Act* as it is proposed may not be sufficient in itself to protect the sources of Ontario's drinking water from potential agricultural contaminants. The Act's effectiveness will depend on the development of appropriate regulations.

That said, the Act as it is proposed grants broad powers to the Lieutenant-Governor-in-Council to create regulations to control the use of "nutrient containing materials." These powers include the authority to make regulations concerning standards for the management of nutrient-containing materials and making those standards compulsory and enforceable. Without restricting the generality of these powers, the Act specifically mentions a number of potential regulations:[77]

- specifying the size and types of containment to be used, as well as construction standards;

- specifying the amounts of nutrient-containing materials that can be applied to lands;

- setting standards for equipment and the transportation of nutrient-containing materials;

- prescribing conditions of use;

- requiring licensing or certification;

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[77] Draft *Nutrient Management Act,* s. 5(1); see Ontario, Ministry of Agriculture, Food and Rural Affairs, 2001, *Nutrient Management Act, 2001: Explanatory Note* <www.gov.on.ca/OMAFRA/english/agops/nutrient_management_act_2001.pdf> [accessed April 29, 2002].

- setting out the requirements of a nutrient management plan, including the requirement for the renewal of the plan;
- prohibiting the application of nutrient-containing materials, except in accordance with a nutrient management plan;
- requiring that nutrient management plans be created by qualified individuals;
- providing for the issuance of approvals and their termination;
- requiring that nutrient management plans be filed;
- enabling the minister or the minister's appointees to make changes to a nutrient management plan;
- governing the requirements for sampling and chemical analysis;
- respecting minimum distance separation guidelines; and
- requiring documentation of management.

With respect to nutrient-containing materials, the Act, if passed in its present form, would certainly provide the Province with the authority to create the tools it would need to develop the farm water protection planning system that I am recommending. There is a substantial overlap between the farm water protection planning I recommend and nutrient management planning for other purposes, and I think it may make sense to deal with both of these issues at once. In other words, it may be best to have a single Act affecting farmers that regulates both nutrient management and source water protection. However, the *Nutrient Management Act* as it is currently drafted does not provide the power to make regulations concerning other aspects of agriculture that could have impacts on drinking water sources, such as the handling of pesticides or fuels. That problem could be addressed either by broadening the scope of the regulatory power under the *Nutrient Management Act* or by integrating the drinking water source protection aspects of regulations under the Act into a broader policy that also includes regulations under the *Pesticides Act* and the *Environmental Protection Act*.

If the Province intends to use the *Nutrient Management Act* as the principal means of regulating the potential impacts of agriculture on drinking water sources, it would be better to say so clearly in a preamble to the Act. Furthermore, if the Act is used to create regulations for the protection of drinking water sources, then separate regulations specifically addressing the matter should be used. The Province should consult with farm groups, conservation authorities, and other affected groups in developing any such regulations.

As I said above, the backbone of regulating farming activity as it relates to the protection of drinking water is the development of individual farm plans. These plans, once developed, should collect in one place all of the requirements of an individual farm for protecting water sources.

4.4.5.6 *Farm Water Protection Plans*

Recommendation 13: All large or intensive farms, and all farms in areas designated as sensitive or high-risk by the applicable source protection plan, should be required to develop binding individual water protection plans consistent with the source protection plan.

Recommendation 14: Once a farm has in place an individual water protection plan that is consistent with the applicable source protection plan, municipalities should not have the authority to require that farm to meet a higher standard of protection of drinking water sources than that which is laid out in the farm's water protection plan.

I discuss the issue of what should be considered large or intensive farms for purposes of this recommendation in section 4.4.5.7.1.

These recommendations are intended to balance two competing interests. On the one hand, municipalities wish to protect the health of their communities from potential problems arising from the contamination of drinking water sources. On the other hand, the agricultural community may feel that it is being regulated from all sides. The approach I propose is that municipalities should deal with all of their drinking water source protection requirements through the watershed-based source protection planning process, in which farmers also participate. Once those plans are in place, farmers whose activities pose a risk to drinking water because of their farm's size, intensity, or location must make their binding individual water protection plans consistent with

those watershed-based plans, in effect implementing the source protection measures that have been developed by the municipalities, the agricultural community, and other affected groups and that have been approved by the Province in the watershed-based process. Municipalities should not then be allowed to unilaterally impose on farmers more stringent measures for the protection of drinking water sources.[78]

This recommendation is not meant to constrain the ability of municipalities to make bylaws for any other purposes.

4.4.5.7 *Planning*

The first facet of the integrated approach to managing the potential impacts of agriculture should be the development of individual farm water protection plans. These plans will serve both an educational and a regulatory function.

Farmers' organizations repeatedly stressed the need to ensure that the regulation of farming activities takes into account the individual circumstances of each farm operation. It is through farm water protection planning that this would occur. The development of such plans need not be overly onerous for farmers. In short, all that will be required of a farm operation is an assessment of the ways in which the farm may create impacts on potential drinking water sources, and a plan for reducing those impacts to an acceptable level.

The level of detail and effort required in preparing such plans will vary from farm to farm, depending on the farm's size and location and the vulnerability of local drinking water sources.

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[78] There are some legal precedents in this area. The recent Supreme Court of Canada decision in *114957 Canada Ltée (Spraytech, Societé d'arrosage) v. Hudson (Town)*, [2001] S.C.J. No 42 held that the municipal power to create bylaws under a "general welfare" provision should not be constrained by the presence of Provincial regulations on the same matter, as long as the bylaws and the regulations are not in conflict and "dual compliance" is possible. On the other hand, in Ontario, s. 6 of the FFPPA specifically constrains the ability of municipalities to make bylaws restricting normal farm practices. The recent decision in *Ben Gardiner Farms Inc. v. West Perth (Township)*, [2001] O.J. No. 4394 (Ont. Civ. Ct.) held that a municipal bylaw restricting farm size did not restrict a normal farm pratice (although s. 6 of the FFPPA was not specifically referenced in the decision). I do not provide an extensive discussion of this issue here, but I appeal to the efforts of those involved in the planning process to respect the intent to have a single process of drinking water–related regulation for farmers.

Recommendation 15: The Ministry of the Environment should work with the Ministry of Agriculture, Food and Rural Affairs, agricultural groups, conservation authorities, municipalities, and other interested groups to create a provincial framework for developing individual farm water protection plans.

As I discuss above, small farms that are not in areas designated as sensitive or high-risk and that are therefore not required to develop a binding water protection plan should nevertheless be encouraged to consider the protection of drinking water sources as part of environmental farm planning.

Environmental farm plans should encourage farmers to catalogue, consider, understand, and commit to minimizing the potential impacts on drinking water sources of their practices, including the following:

- their manure management practices, including the land spreading of manure;
- the spreading of biosolids or septage;
- the use of chemical fertilizers;
- ways of dealing with stormwater runoff, including tile drainage;
- pesticide use; and
- fuel management.

This assessment could be completed by the farmer using a guidance document prepared by the MOE and OMAFRA.

A second category of farms includes large or intensive farms and small farms that are in areas specially designated as sensitive or high-risk by the watershed-based source protection plan. Each such farm will require a detailed farm water protection plan, which should include a hydrogeological assessment of the farm's operation. This two-tiered system embraces a risk-based approach to regulating agricultural impacts.[79] It has been recognized that larger farms may

[79] I discuss risk-based approaches in detail in Chapter 3 of this report.

require more detailed nutrient management planning,[80] and the same reasoning supports a stronger regime for planning for drinking water source protection. Small farms in sensitive or high-risk areas also pose a greater risk to drinking water sources, so they should also be subject to the more stringent regime.

The completed plans of farms in this second category should be submitted to the MOE for approval. Once approved, these plans should achieve the force of regulation, and their minimum requirements should be enforceable by the MOE.

Once again, these plans should embrace the concept of continuous improvement. If, in the process of creating a farm water protection plan, the farmer or a consultant identifies areas in which the farm is not in compliance with regulations, the farmer should take immediate action to achieve compliance.

Plans for larger farms or for farms that are in areas designated as sensitive or high-risk must be approved and held on file by the MOE. Preparing such plans may require the assistance of a third-party professional. The third party could be an expert from any of a number of fields, including agrology, agronomy, and environmental science. The key issue is that the experts' backgrounds must allow them to examine all the relevant impacts of farm activities.

4.4.5.7.1 Small Farms versus Large or Intensive Farms

The distinction between small and large farms is contentious and is necessarily arbitrary. That, however, is not a reason not to draw such a line.

There are several possible cut-offs being proposed or in use elsewhere. In its proposed nutrient management strategy, the Ontario Farm Environment Coalition (OFEC) uses a cut-off number of 150 livestock units, or 50 livestock units with a density of higher than 5 units per hectare, to distinguish between operations that it suggests should be required to produce a nutrient management plan before being issued a building permit and those that should not.[81] The ALERT/Sierra Club coalition recommended a similar number as the cut-off

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[80] D. Armitage, Ontario Farm Environmental Coalition, Walkerton Inquiry Submission (Public Hearing, September 6, 2001), transcript p. 111.

[81] See Ontario Farm Environmental Coalition, *Nutrient Management Planning Strategy* <www.ofa.on.ca/aglibrary/Research/Nutrient%20Management%20Planning%20Strategy/default.htm> [accessed April 30, 2002].

between a large farm and a small one.[82] The U.S. Environmental Protection Agency uses a higher number (defining fewer than 300 animal units as a small animal feeding operation),[83] but permits states to make more stringent regulations. The current draft of the *Nutrient Management Act* discusses a "large livestock operation" category that includes operations that have more than 450 livestock units.

My intention in proposing a two-tiered system is to avoid imposing undue restrictions or requirements on those who operate farms that truly pose a very small threat to drinking water sources. Based on the assumption that larger volumes of manure are more difficult to handle, larger farms present greater risks. Certainly, a larger hazard exists in the event of a catastrophic failure if a larger volume of manure is present. Still, I have heard some arguments that support and others that deny the assertion that larger operations are riskier.

Simply put, large farms create more manure, and for that reason alone they create a greater risk. If that manure is transported elsewhere, the potential risk may be smaller, and the farm water protection plans will be correspondingly adjusted. However, the sheer size of the large operation, in my view, calls for the increased protection of developing a plan that requires MOE approval.

The provincial government, in consultation with affected groups, should develop distinct definitions of "large farms" and "small farms" in view of the regime I am recommending.

4.4.5.8 *Education*

The Ministry of Agriculture, Food and Rural Affairs should work in cooperation with the Ministry of the Environment and conservation authorities to review

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[82] D. Mills, ALERT/Sierra Club coalition, Walkerton Inquiry Submission (Public Hearing, September 6, 2001), transcript p. 39.

[83] See U.S. Environmental Protection Agency, 2000, *AFO or CAFO* <www.epa.gov/r5water/npdestek/npdcafoafovscafo.htm> [accessed January 4, 2002]. Note that the definition of "animal unit" varies from jurisdiction to jurisdiction, depending on species (e.g., cows vs. sheep), type (e.g., beef cows vs. dairy cows), and life stage. The U.S. EPA and the OFEC agree that one beef cow is 1 animal unit, but the OFEC would count two feeder cattle as 1 animal unit, whereas the U.S. EPA would count two feeder cattle as 2 animal units. Moreover, the U.S. EPA definitions are generally more conservative. Thus, it is possible that the 300 animal units discussed by the U.S. EPA and the 150 animal units discussed by the OFEC could refer to the same number of animals, depending on the individual operation.

education programs for farmers and, if necessary, develop new ones. These programs should have as their primary goal assisting farmers with the development of water protection plans.

Many would argue that this should indeed be the first element in the system for protecting drinking water sources from the potential impacts of agriculture. Two of the papers commissioned for the Inquiry found that an effective program for the control of non–point source pollution, such as that which comes from agriculture, must be supported by an effective education program if it is to work.[84] This suggestion was also supported by most parties at the public hearings. Without an effective education program that creates a desire to comply on the part of the regulated, enforcement becomes more difficult.

4.4.5.9 *Economic Incentives*

Recommendation 16: The provincial government, through the Ministry of Agriculture, Food and Rural Affairs in collaboration with the Ministry of the Environment, should establish a system of cost-share incentives for water protection projects on farms.

According to one of the papers commissioned for the Inquiry, voluntary programs that emphasize education and the adoption of suites of "best management practices" tend to be effective only insofar as they do not affect farm profitability.[85] When such programs would create significant reductions in profitability, economic incentives are generally provided. Such incentives may seem unfair to people in other industries that may not be eligible for such cost-sharing. However, farmers argue that society as a whole benefits both from environmental protection and from inexpensive food, and that farmers who do not qualify for the incentives are less likely to adopt the practices.[86] Economic incentives are a well-accepted part of managing impacts from agricultural non–point source pollutants in other jurisdictions.[87] I think they should be used, where appropriate and with due care, in Ontario.

The Inquiry's commissioned papers cited in the previous paragraph, my consultations with farm groups during the public hearings and with individual

[84] Goss et al., p. 24; Johns, p, 9.
[85] Goss et al., p. 22.
[86] This argument has less force in a system in which compliance is mandatory.
[87] Goss et al., p. 23; Johns, pp. 11–23.

farmers during the town hall meetings, and the written submissions I received from the farm associations amply demonstrated that the financial support of provincial programs such as the environmental farm plan program results in a high level of participation from farmers. In addition, many of the Part 2 parties that were not farm organizations were supportive of financial incentives for farmers.

However, I also understand the need to limit provincial spending. I encourage the Province to continue to provide support for environmental initiatives in general and for water protection projects on farms in particular. The selection of projects should be based on the level of environmental protection per dollar – that is, it should include a consideration of the level of support required and the sensitivity of the area to be protected.

Abandoned wells deserve special mention. There are thousands of abandoned or improperly decommissioned wells in Ontario. They create direct threats to drinking water sources because they provide a direct connection between surface water and groundwater. The vast majority of these wells are located on agricultural properties.

Such wells are a hindrance and a threat to farmers as well as to groundwater. Farmers are keen to see the wells properly decommissioned, but there can be a substantial expense associated with decommissioning. The MOE should develop a program for encouraging farmers to identify improperly decommissioned wells and should provide cost-sharing for their decommissioning.

4.4.6 Other Industries

Recommendation 17: The regulation of other industries by the provincial government and by municipalities must be consistent with provincially approved source protection plans.

A large number of other industries and activities may have an impact on sources of drinking water. Those mentioned during this Inquiry include the following:

- the spreading of road salt;
- forestry;
- mining;

- urban development; and
- industrial plants.

These industries and activities can pose just as serious threats to the safety of drinking water as those resulting from farming operations.

I envision that the potential for these activities to contaminate drinking water sources should be limited by the appropriate regulatory agencies in accordance with the watershed-based source protection plans.

In the end, I recommend that no activities, whatever the source, be permitted to contaminate drinking water sources in contravention of source protection plans.