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BRIEF TO THE STANDING COMMITTEE ON RESOURCES DEVELOPMENT ON BILL 107:

THE *WATER AND SEWERAGE SERVICES IMPROVEMENTS ACT, 1997*

CIELAP Brief 97/2

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Brief to the Standing Committee on Resources Development on Bill 107: the *Water and Sewerage Services Improvement Act*

I. Introduction

The Canadian Institute for Environmental Law and Policy (CIELAP) welcomes the opportunity to address the Standing Committee on Resources Development regarding Bill 107, the *Water and Sewerage Services Improvement Act*. This is a significant piece of environmental legislation, with major implications for the health and well-being of present and future generations of Ontarians.

The Act has two major components. The first transfers the ownership of provincially owned and operated water and sewage treatment plants to municipalities. This constitutes approximately 25% of the existing plants in the province, mostly in rural areas. The second component of the Bill transfers responsibility for the regulation of septic systems from the Ministry of Environment and Energy to municipalities or, in the case of areas without municipal organization, the Ministry of Municipal Affairs and Housing.

We have serious concerns regarding both aspects of the Bill, and cannot support it in principle. The Bill fails to address a number of long-standing problems regarding the provision of sewer and water services in the province. These include the poor record of environmental performance by sewage treatment plants, largely due to deferred capital maintenance, and the issue of industrial discharges to municipal sewage systems.

In addition, the Bill does not address the question of the potential vulnerability of many of the province's surface water treatment plants to bacterial contamination, or the need to update Ontario's drinking water standards. Longstanding issues regarding the contamination of surface and groundwater by inappropriate the use, and malfunctioning of septic systems are also left unresolved. Indeed, the Bill seems likely to exacerbate these problems.

Furthermore, Bill 107 opens the door to the possibility of the privatization of sewer and water infrastructure following its transfer to municipal governments. The privatization of sewer and water services in England has led to serious public health problems, water shortages, and the cutting off of water supplies to low-income families. The Bill appears to contemplate the privatization of the approval and inspection of septic systems as well. This possibility raises serious concerns regarding accountability and potential conflicts of interest.

II. Specific Comments Re: Bill 107

Section 1 - The *Municipal Water and Sewage Transfer Act, 1997*

Section 2

This section gives the Minister of Environment and Energy broad powers to make orders transferring the Ontario Clean Water Agency's (OCWA) water works, sewage works, assets, rights and obligations to a municipality. However section 2(5) limits the transfer of certain liabilities.

Section 3

This section provides that an order which transfers an interest in land from OCWA to a municipality may be registered on title in the appropriate land registry office. There is no restriction on a municipality disposing of former OCWA properties once they have been transferred.

Section 11

This clause is an extremely broad Crown immunity clause intended to bar certain civil actions against the Crown, and its Ministers and public servants. The reasons for this clause are unclear. It appears to suggest that the government contemplates residents suffering some harm which might give them cause of action against the Crown or its agents as a result of a transfer.

Section 2 - Amendments to the *Capital Investment Plan Act, 1993*

Section 2 of Bill 107 does two things. First, it repeals section 53 of the *Capital Investment Plan Act, 1993* (CIPA), which transferred various assets and liabilities to the OCWA when the Agency was first established.

Secondly, it relieves the Agency and Crown of any obligation entered into with municipalities to construct, expand, or finance the construction of water works or sewage works before section 2 of Bill 107 comes into force. However, this provision does not apply were the Agency or Crown has entered into an agreement with a "construction contractor" prior to section 2 of the Bill coming into force. These provisions appear to provide for the protection of the interests of construction contractors, but not of municipalities which have entered into agreements with the Agency or the Crown.

The new section 56.2 of the CIPA prohibits municipalities from transferring ownership of water and sewage works unless there is repayment of provincial funds received since 1978 to subsidize the capital costs of such water and sewage works. In his remarks accompanying the Bill, the Minister of Environment and Energy indicated that this clause was intended to provide a disincentive to the privatization of former OCWA sewer and water works once they had been transferred to municipalities.

Section 4 of the Bill amends the *Regional Municipalities Act* in order to permit the regional municipalities of Haldimand-Norfolk and Sudbury to receive the transfer of authority under Section 3 of the Bill.

Comments Re: Sections 1, 2 and 4

These provisions raise a number of extremely serious concerns. They provide for the downloading of responsibility for the operation and maintenance of 77 water works and 153 sewage treatment plants owned and operated by the province to municipalities. It is important to note that this is occurring at a time when the province is terminating the Municipal Assistance Program, which provided capital and operating grants for the operation of municipal sewer and water systems.

Many of the water and sewer works which are to be transferred are themselves in need of significant capital maintenance. A 1991 review of the environmental performance of sewage treatment plants found that 91 of the province's 415 facilities were not in compliance with the applicable effluent limits or guidelines.[1] Eight of the ten worst performing plants were MoEE owned and operated facilities.[2]

It is reported that in many cases plants are not performing sampling in accordance with Ministry guidelines, and have failed to monitor and report "by-passes" during which untreated sewage is released to receiving waters.[3] In his 1994 Annual Report, the Provincial Auditor noted that the Ministry of Environment and Energy has been consistently unwilling to take enforcement actions against municipally or provincially operated sewage treatment plants.[4]

In addition, significant deficiencies have been identified with respect to Ontario's water treatment plants. In her 1994-1995 Annual Report to the Legislature, the Environmental Commissioner noted, for example, that approximately 40 such plants were potentially vulnerable to contamination of water supplies by cryptosporidium, a microorganism which causes disease in humans and other hosts.[5] This was confirmed by the Minister of Environment and Energy in March of 1996.[6] The problem is largely due to a lack of adequate filtration processes at the plants in question.

In 1993, more than 400,000 people were infected, and at least 100 died, when the City of Milwaukee's water supply was contaminated with cryptosporidia.[7] In adequate

water treatment facilities were also implicated in the outbreak of cryptosporidia in early 1996.[8]

In her 1994-95 Annual Report, Environmental Commissioner also noted in her report a number of requests for the review the province's drinking water standards for a number of substances received under the *Environmental Bill of Rights*. The need for new standards for Tritium and Trichloroethylene were highlighted in these requests.[9]

Given these considerations, the government's proposal has the potential to set the stage for a steady deterioration of the state of Ontario's existing sewer and water infrastructure. This may ultimately lead to significant threats to public health.

It is important recall the rationale for the creation of the predecessor to the Ministry of the Environment and OCWA, the Ontario Water Resources Commission. The Commission was established to provide, among other things, financial assistance to municipalities to enable them to build and maintain required sewer and water infrastructure which they could not otherwise afford.[10]

The internalization of the costs of the establishment of new sewer and water infrastructure by municipalities may, in the long term, have the effect of discouraging urban sprawl. However, consideration must also be given to the maintenance and upgrading of existing infrastructure. The government's proposal fails to deal with this issue. It simply off-loads the costs of providing all sewer and water infrastructure onto municipal governments which, in many cases, lack the economic resources to maintain these services.

Specifically with respect Bill 107's amendments section 56.2 of the CIPA, if it is the government's intention that former OCWA facilities not be privatized, then the Bill should deal with this issue directly, and bar such transfers. The recent privatization of sewer and water infrastructure in England has resulted in serious public health problems, including outbreaks of dysentery and Hepatitis A. In addition, it has produced substantial increases in water prices, the termination of water services to low-income families unable to afford the increased rates, severe water shortages and restrictions on non-essential water uses, and the sell-off of reservoir lands for development purposes. The anticipated re-investments of profits in the maintenance and upgrading of sewer and water infrastructure has not occurred.[11]

In addition to these problems, Bill 107 fails to deal with a number of longstanding problems which have been identified with Ontario's sewer and water systems beyond its aging and inadequate infrastructure. Prominent among these issues is the discharge of industrial wastes into municipal sewer systems.

Estimates of the amounts of liquid industrial and hazardous wastes discharged into Ontario's municipal sewer systems range from 350,000 to 1 million tonnes/yr.[12] These

discharges have resulted in the disruption of sewage treatment process, the corrosion of sewer lines, pumps and other equipment, and public and worker health and safety hazards due to fires, explosions and releases of toxic substances.[13] Industrial discharges to sewers also result in the contamination of sewage sludge with toxic substances which render it unsuitable for use as a soil conditioner. The component of the Municipal-Industrial Strategy for Abatement (MISA) program intended to deal with this issue has been canceled by the current government.

Section 3 - Amendments to the *Environmental Protection Act*

Section 3 of Bill 107 transfers from the Ministry of Environment and Energy to municipalities the general responsibility to regulate the construction and use of sewage systems under Part VIII of the *Environmental Protection Act*. In unorganized territories, responsibility is transferred to the Ministry of Municipal Affairs. In general, Part VIII sewage works include septic tanks, small private sewage works, and other systems that do not discharge directly into watercourses.

Comments Re: Section 3

This section gives rise to a number of serious concerns. No resource transfers to either municipalities or the Ministry of Municipal Affairs appear to be contemplated to support these new responsibilities. For its part, the Ministry of Municipal Affairs has no experience or expertise in environmental or public health regulation of this type. Municipalities will also be faced with serious challenges in fulfilling their new responsibilities. A wide range of other functions being are downloaded onto local governments by the province at the same time, and significant reductions in provincial transfer payments are being implemented.

The Commission on Planning and Development Reform in Ontario has called pollution from these sewage systems "a sleeping giant", because the pollution is so widespread, but has received so little public attention.[14] Systems such as the septic tank and tile bed can handle both human wastes and wash wastes, but their effectiveness depends on having the right kind of soil available to the right depth. Without adequate soil and sufficient separation from groundwater, neighbouring wells, and watercourses, these systems cause pollution of groundwater, surface water, and drinking water. Sewage may pond on the surface of the ground, then run off into ditches or watercourses. Even when these systems are properly designed, they will eventually fail - usually within twenty years. However, there is no requirement to replace an old system until it actually fails and begins to pollute its surroundings.[15]

Septic systems require soil to filter the effluent as it passes through the tiles. Therefore, they are ineffective in much of Ontario's cottage country, where there is only a thin layer of soil above the bedrock. Many of the existing septic systems in areas like

Muskoka and Haliburton have been leaking untreated sewage into the lakes for years. This was confirmed in the Ministry's 1992 Status Report on Ontario's Air, Water and Waste, released in January 1997.[16]

In addition, while these systems may be effective in rural areas where there are large lots, housing subdivisions are often constructed in urban and suburban areas, where the lots are too small to hold a properly-designed tile bed. However, municipalities have continued to approve severances and subdivisions under the *Planning Act* without regard to whether these new lots are suitable for an in-ground sewage system.

It has been estimated that there are approximately 1 million septic systems operating in Ontario, and that 40,000 new systems are approved each year by the Ministry of Environment and Energy. About 30 per cent of the province's septic systems are reported to be malfunctioning and discharging sewage to surface or ground waters.[17] In the past, the Ministry has conducted approximately 1,000 inspections of septic systems each year.[18] A detailed discussion of the environmental and health problems associated with septic systems, excepted from the joint CIELAP/Emond-Montgomery Publications Ltd. 1995 publication Toxic Time Bombs: The Regulation of Canada's Leaking Underground Storage Tanks is attached for the information of the members of the Standing Committee.

The government's proposals regarding the delegation of responsibility for the approval of septic systems are particularly disturbing when read in combination with the remainder of Bill 107. The requirement that municipalities internalize the costs of new sewer and water infrastructure could have the effect of discouraging new urban development. However, there is also the possibility that municipalities, anxious to obtain additional tax revenues from new developments, may be tempted to use their new authority to approve septic systems to facilitate such developments. This would likely add to the already serious environmental and public health problems which have been identified with respect to the use of septic systems in the province.

In addition to providing for the transfer of responsibility for the regulations of septic systems to municipalities or the Ministry of Municipal Affairs and House, Part 3 of Bill 107 appears to open the possibility of the privatization of these functions following this redistribution of responsibilities (ss.74.4(2) and 75.2(2)). This raises serious questions of accountability, and potential conflicts of interest.

Conclusions

Bill 107 is an extremely complex and problematic piece of legislation. There appears to be no environmental rationale for its presentation. Indeed, the legislation fails to address the many serious existing problems which have been identified with respect to the province's sewer and water infrastructure by the Provincial Auditor, the

Environmental Commissioner for Ontario, Commission on Planning and Development Reform, and the Ministry of Environment and Energy itself. These include:

* aging and deteriorating capital infrastructure;

* the lack of effective controls on industrial discharges to municipal sewer systems;

* increasingly outdated and inadequate standards for drinking water; and

* continuing failures of sewage treatment plants to meet provincial effluent guidelines.

Serious, and growing problems have also been identified regarding the establishment and operation of septic systems in the province. Bill 107 does nothing to deal with these issues. Rather, in our view, the implementation of Bill 107 seems likely exacerbate many of these problems. We cannot support the Bill in principle for these reasons.

We would however, be pleased to work with the government on ways to address the significant environmental and economic challenges in the delivery of sewer and water services to the people of Ontario, as we enter the next century.

Endnotes

1.Ministry of Environment and Energy, Report on 1991 Discharges from Municipal Sewage Treatment Plants in Ontario (Toronto: 1993).

2.Ibid., Figure 3.

3.Office of the Provincial Auditor, 1994 Annual Report (Toronto: Legislative Assembly of Ontario, 1994), pp.81-83.

4.Ibid., pg. 82.

5.Environmental Commissioner for Ontario (ECO), Annual Report 1994-95: Opening the Doors to Better Environmental Decision-Making (Toronto: Legislative Assembly of Ontario, June 1996), pg.49.

6.D.Saunders, "Water in 43 communities vulnerable to bug, minister says," The Globe and Mail, March 30, 1996.

7.Paul Taylor, "Illness flows from tap, lurks at grocer," The Globe and Mail, April 14, 1997.

8.D.Saunders, "Collingwood boils over water purity," The Globe and Mail, April 11, 1996.

9.ECO, Annual Report 1994-95, pp.48-49.

10.On the OWRA and its history, see M.Winfield, The Ultimate Horizontal Issue: environmental Politics and Policy in Ontario and Alberta 1971-1992 (Toronto: Ph.D. Thesis, Department of Political Science, University of Toronto, 1992), esp. ch.2.

11.See N.B. Freeman, Ontario's Water Industry: Models for the 21st. Century (Toronto: Ontario Municipal Water Association, 1996). See also Brendan Martin, "From the Many to the Few: Privatization and Globalization" The Ecologist, Vol.26, No.4, July/August 1996.

12.M.Winfield, Hazardous Waste Management in Ontario: A State of the Environment Report (in progress, Canadian Institute for Environmental Law and Policy, April 1997). Estimate is largely based on data presented for purposes of the environmental assessment of the Ontario Waste Management Corporation's proposed hazardous waste treatment and disposal facility.

13.Ministry of Environment and Energy (MoEE), MISA Municipal Program, January 1994, pg.4.

14.Commission on Planning and Development Reform in Ontario, New Planning News Vol.1, no.3, (December 1991).

15.J.Swaigen and M.Winfield, "Water," in J.Swaigen, ed., Environment on Trial: A Guide to Ontario Environmental Law and Policy (Toronto: Canadian Institute for Environmental Law and Policy and Emond-Montgomery Publications Ltd., 1993), pg.533.

16.Ministry of Environment and Energy, 1992 Status Report on Ontario's Air, Water and Waste (Toronto: Ministry of Environment and Energy, released to the public January 1997), pg.51.

17.ECO, 1994-95 Annual Report, pg. 52-53.

18.Ibid., pg.52.

ATTACHMENT

"Septic Systems: The Sleeping Giant"

from:

J.Swaigen,
Toxic Time Bombs:
The Regulation of Canada's Leaking Underground Storage Tanks
(Emond-Montgomery Publications, 1995)

Toxic Time Bombs

The Regulation of Canada's Leaking Underground Storage Tanks

John Swaigen

a project of the
Canadian Institute of Environmental Law and Policy

1995
Emond Montgomery Publications Limited

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Septic Systems: The Sleeping Giant

In most rural areas of Canada, as well as many urban areas that are not yet served by sewers connected to sewage treatment plants, the main method of disposing of sewage is the septic system.

Basically, the system consists of a tank (usually buried) into which sewage is discharged from toilets, sinks, bathtubs, showers, and washing machines and a disposal field. Solids are separated from liquid in the tank. The heavier solids sink to the bottom and the lighter ones, such as fat and grease, rise to the surface, forming a layer of scum. Much of the sludge and scum is liquified in the tank through decomposition. The remaining solids must be removed from the tank periodically.

The liquid flows out of the tank into the underground disposal field. The disposal field consists of rows of drainage tiles laid in gravel-lined trenches. The effluent flows through the tiles into the trenches and surrounding soil where it is further treated by bacteria in the ground. Some of the effluent is taken up by the roots of plants or evaporates into the air, but most percolates down toward the water table. The tile field must be large enough to allow this process of absorption and digestion to occur at a rate that does not overload the capacity of the vegetation and the surrounding soil to fulfill these functions. The tile bed must also be a sufficient distance from wells and water courses to prevent them from being contaminated. It must be constructed in soil with a permeability low enough to absorb the effluent and prevent surface breakout and ponding of sewage, but high enough to prevent effluent from migrating through the soil more quickly than it is treated. For this purpose, the tile bed must also be constructed a sufficient distance above the water table and bedrock.

The septic tank itself can fail through corrosion or cracking that permits leakage into the soil or through mechanical failure that may prevent effluent from entering the disposal field, resulting in overflowing or backup of effluent into the plumbing system.

Once the effluent enters the disposal field, effluent may fail to be absorbed by the soil or treated for a variety of reasons, including soil permeability that is too low or too high, an excessively high water table, blockages in the tile due to damage to the tiles or buildup of sludge, or too small a tile bed.

All septic systems have a limited life span. The tile bed will eventually clog up and cease to fulfill its function. Estimates of the expected life of a typical septic system vary from 15 to 30 years, depending on the expert

consulted and the nature of the soils and other conditions in a particular area. Many systems in Canada are reaching or have surpassed their life expectancy, resulting in frequent complaints of pollution from these systems.

The results of septic system failure can be exposure of humans to bacteria, and possibly to viruses, that can cause severe stomach and digestive tract illnesses, as well as other diseases. Moreover, even a properly functioning septic system will not adequately treat nitrates, phosphorus, and other materials found in effluent, such as some pesticides, solvents, cleansers, degreasers, paint, oil, and unwanted medicines and drugs.

Nitrates are of particular concern because they are thought to be a cause of cyanosis or "blue baby" syndrome, a disease caused by oxygen deficiencies in the blood. Nitrates will accumulate in the soil at a faster rate than they break down, and will eventually migrate through the soil to surface or ground waters.

The Health and Environmental Impacts of Leaking Septic Systems

The US Environmental Protection Agency (EPA) has stated that effluent from septic tanks is the most frequently reported cause of groundwater contamination in the United States.[1] It has been suggested that groundwater contamination from this source is the most frequently reported cause of water-borne disease outbreaks associated with the consumption of untreated ground water.[2]

In December 1991, the Commission on Planning and Development Reform in Ontario issued a newsletter calling the issue of septic system pollution "a sleeping giant."[3] The commission quoted an official in the Ontario Ministry of the Environment responsible for the coordination of the ministry's septic system approvals program as saying, "it's hard to get people to realize the sleeping giant that this issue is."

The commission noted that "the problem is now coming to light." It stated that "evidence is mounting about harmful effects" of installing septic systems in urban-style subdivisions. "Every jurisdiction got caught with its pants down," according to a Ministry of the Environment official quoted in the newsletter.

The belated discovery of the problem of septic system pollution by the commission and by regulators raises the question why government authorities have been "caught with their pants down." In fact, the problem is neither new nor novel. Widespread pollution from septic systems has been a problem for decades, and some government officials have been warning for almost 30 years that the problems we are now facing would materialize.

It has been apparent since at least the 1960s that the increasing density of developments relying on septic systems was leading to widespread

pollution problems. For example, by the mid-1970s, nitrate pollution of ground water to which septic systems were contributing had been documented in Nova Scotia, Delaware, Minneapolis, California, Illinois, and Ontario. In fact, high nitrate values had been documented in California as early as 1947.[4] Nitrate levels in the Great Lakes have also been steadily rising. Nitrate-nitrogen levels in Lake Ontario more than doubled between 1968 and 1987.[5]

John F. Jones, the former chief of the Groundwater Section of the Nova Scotia government, warned of the problem of increasing nitrate values in ground water in 1965.[6] By 1974, Gibb and Jones reported that "nitrate values in some [Nova Scotia] wells reached alarming proportions."[7] They stated that it is likely that excessive concentrations of nitrate in ground water had probably existed in the past and were only being discovered in the mid-1970s as a result of increased frequency of water monitoring. They attributed these excessive concentrations to the increased use of nitrate fertilizers and "the increasing density of individual sewage disposal system development."[8] They concluded that "the magnitude of septic tank pollution and/or contamination increases with the density of development. Therefore, even if the problem is not current in Nova Scotia, *it very probably would happen in areas of concentrated septic tank development in the future*" (emphasis added).[9]

The accuracy of this prediction was borne out by examples such as the pollution of wells in North Sydney, Nova Scotia and of wells and roadside ditches in the Priestville and Walkerville communities in Pictou County, Nova Scotia. In March 1982, in the Seaview Drive area of North Sydney in Cape Breton County, bacterial contamination of the wells serving 19 homes was attributed to the owners' and neighbours' septic tanks and tile fields. The provincial Department of Health had been aware of such water quality problems since the early 1970s.[10] In Priestville and Walkerville, a 1980 study found that 70 percent of the homes surveyed in these communities had either inadequate water quality or quantity. Many of the quality problems were due to leakage from on-site in-ground sewage systems. Some of these systems were discharging gray water (sink and bathtub wastes) and black water (sewage) directly into roadside ditches.[11]

Similarly, outbreaks of water-borne diseases attributable to septic systems have been occurring for decades, and have frequently occurred in areas of high septic system density.[12] For example, a high incidence of infectious hepatitis in the Halifax area was attributed to the contamination of wells by septic tank effluent in the early 1960s.[13] Outbreaks of hepatitis and typhoid occurred in Washington, Colorado, Florida, Arkansas, Michigan, and other areas of the United States throughout the 1960s and 1970s and were documented in published studies.[14]

Some of the potential problems were recognized in British Columbia as early as 1974. A government task force report on sewage disposal poli-

cies in unorganized areas of the province recognized that land development in those areas was characterized by a lack of long-term planning.[15] The report commented on the fact that the effects of future planning and sewage disposal were not considered in the regulations governing on-site sewage systems; the limited, imprecise and inaccurate use of percolation tests in determining whether soil was suitable for such systems; the absence of any requirement for periodic maintenance of disposal systems; and the lack of consideration of the cumulative impacts of additional development. A 1979 report on septic tanks in the Okanagan Basin "implied that provincial regulations are not strict enough."[16] A 1987 government report on rural sewage disposal problems identified 73 areas in the province with significant sewage disposal problems. It estimated the cost of correction at $47 million. The sources of the problem were described as small lot sizes, cumulative effects of development of an area, weakness of the percolation test, and drainage from uphill areas.[17] In response to continuing complaints, the BC ombudsman conducted an investigation of the process of issuing permits for septic systems. He concluded that, "[t]o many of those affected, the rules regarding the creation of a septic field seem unclear, ever changing and inconsistently applied."[18]

Despite several amendments to regulations and changes in institutional arrangements and methods of funding development infrastructure, the ombudsman concluded that serious problems had not been addressed:

> There remains little dispute that on-site sewage problems continue to cause many government officials, elected politicians, land developers, and home owners enormous grief and frustration. The Charlie Lake subdivision near Fort St. John (correction costs $2 million), the Black Mountain Subdivision near Kelowna (correction costs $6 million), the Pritchard Subdivision near Kamloops (correction costs $1 million) and the Barnhardtvale subdivision also near Kamloops (correction costs $20 million) serve as reminders of the high cost of fixing malfunctioning systems. There is general agreement that we have seen only the beginning of the emergence of such problem sites. Old standards and practices used in approving systems 15 years ago for the most part continue to be used today. As these systems continue to fail, the cost of correction will increase significantly. It would appear that strictly from an economic perspective, recommendations contained in government task force reports of 1987 and 1974 can no longer be ignored.[19]

By 1977 – almost 20 years ago – the US EPA had concluded that septic systems were the most frequently reported cause of groundwater contamination in the United States. There was ample evidence to support similar conclusions in Canada. According to one report, domestic wells have been contaminated by bacteria or nitrates in East Selkirk in Manitoba; in Sault Ste. Marie and Woodville in Ontario; and in Milton and Brooklyn in Nova Scotia.[20] Many other examples are found in other reports and in newspaper clippings. Despite the evidence of a widespread and serious

septic system pollution problem in Canada, a 1986 report prepared for Environment Canada concluded that, "[o]f all the major sources of contamination, septic systems receive the least attention, probably because they are mundane and so ubiquitous that it is not realized that they should be an environmental concern."[21]

If public authorities are just now "discovering" the septic system problem, the reason does not appear to be lack of information. In fact, the reason for the "discovery" of the problem appears to be similar to the reasons for delay in dealing with the problem of leaking underground petroleum product tank systems. First, large numbers of systems installed decades ago are now beginning to malfunction, and, second, increased population density means that these failures are much more likely to cause adverse impacts on water used by neighbours for drinking or aquatic recreation than in the past. This has now made it more difficult for governments to continue to ignore a problem that they have known for decades was likely to occur.

As a result of not taking action earlier, governments will now be forced into a reactive mode in which correction is generally much more costly and difficult than prevention would have been if action had been taken earlier.

The Economic Impacts of Leaking Septic Systems

The research into the economic implications of inadequate regulation carried out for this part of this study was much less extensive than the research into the economic impacts of leaks from underground petroleum tanks. Nevertheless, there is evidence to suggest the same pattern that emerges in relation to petroleum USTs – namely, substantial costs resulting from the failure to take steps to prevent leaks and the frequent displacement of those costs from the person at fault to third parties, including shifts in the cost of correction from vendors and installers responsible for the construction of buildings with deficient systems to purchasers of these homes and businesses and the displacement of costs from the builders, vendors, and owners of deficient properties to government agencies.

Under Ontario's regulations, for example, the officials responsible for administering the regulations are generally empowered to order the owner of a defective sewage system, rather than the vendor of the land or system or the installer, to correct malfunctions. Purchasers are often left to their own devices to prove negligent design or installation. The installation of a septic system for a single-family residence in Ontario generally costs between $3,000 and $6,000. However, system failure may result in remedial costs may be as high as $25,000 per home.[22] Although such systems are generally expected to last 15 to 30 years, in fact, one study found that 16 percent of the systems installed in Ontario between 1985 and 1991 mal-

functioned within the first 7 years.[23] The potential liability to consumers for the failure of these sewage systems was estimated to be $75 million.[24] At the time of writing, one outstanding lawsuit claimed damages of $1 million as a result of the alleged failure of 15 septic systems and the anticipated failure of another 16 systems installed between 1989 and 1993 in a housing subdivision in Ajax, Ontario. The developer was suing the consultant who prepared a report on the soil conditions, the designer of the systems, the installer, and the government agency that approved the systems.[25]

Another economic consequence of septic system pollution is the need to replace private wells with municipal piped water supplies. Septic system contamination has had this result, for example, in some municipalities in Nova Scotia[26] and Ontario. One consultant estimated in 1980 that to upgrade the quality of the private wells serving 88 households in Priestville and Walkerville, Nova Scotia would cost $150,000, while replacing the on-site sewage system with a centralized sewage collection and disposal system would cost between $410,000 and $674,000.[27] One former New Brunswick government official estimated that in the 1980s it typically cost $2 million to $43 million, or an average of $18,000 to $20,000 per house, to replace failed septic systems in rural subdivisions with sewer system and central sewage treatment plants. Examples of this in New Brunswick included a subdivision of about 50 homes outside Grand Falls and the village of Barrett, near Edmundston, where "25 to 30 per cent of the wells were contaminated with fecal material from their own septic tanks." The largest portion of these replacement costs was borne by the New Brunswick government.[28] The replacement of private water supplies by municipal services imposes additional costs on landowners as well as on public authorities. Such costs would most likely be similar in the case of sewage contamination to those indicated for petroleum contamination in chapter 2, and are frequently in the millions of dollars. For example, several rural areas annexed by Windsor, Ontario in 1977 had septic systems so primitive that the tanks discharged directly into municipal ditches and sewers. Many of the lots were too small to contain a disposal bed. As a result, sewer systems and sewage treatment plants had to be built to service new subdivisions and to replace deficient septic systems in these areas. The cost has largely been borne by the federal government through the Central Mortgage and Housing Corporation and through grants from the Ontario government and funds from the City of Windsor. Between 1987 and 1982, $39.5 million in provincial and municipal tax dollars was spent on this.[29]

Residents of a housing subdivision in London, Ontario, known as South Winds Village, also had to abandon their septic systems and connect to a newly constructed municipal sewer system only six years after they purchased their homes. The septic systems were installed around 1988, and effluent was ponding on the ground above the leaching beds within a few months. In at least one case, the cost of carrying out an order to convert the septic tank to a holding tank and pump it out every week or two was

borne by the Ministry of the Environment rather than the developer of the subdivision or the contractor who installed the septic system.

Residents of such areas are also often required to contribute to the cost of replacement programs through "local improvement" levies. For example, in the McNabb subdivision in the Muskoka area of Ontario, a residential area plagued by drinking water problems to which leaking septic systems contributed, residents were to be connected to the town's water supply if they approved a local improvement project. The cost to the 87 owners of 93 affected properties would be $506,000, an average of $5,216 per lot.[30]

Like the petroleum leak situation, those who create the problem are not always required to internalize the costs of prevention or correction. In some cases, as indicated above, government agencies require that the cost of replacing defective systems be borne by homeowners who have purchased properties with such systems, rather than the vendors of the properties or the installers of the systems. In other cases, government subsidies to cover the cost of replacement are offered.

The Legislative Framework for Regulating Septic Systems

The legislative framework for regulating septic systems generally includes two primary sources of regulation:

- land-use planning legislation, generally administered by municipalities with some supervision from provincial departments that are responsible for planning urban growth and development and the provision of housing; and
- specifications for septic system design and installation and licensing requirements for septic system installers, generally administered by provincial or municipal departments that are responsible for the protection of public health or the environment.

Commentators generally agree that the problems in this area stem largely from the failure to integrate environmental considerations into the land-use planning process. Many of the problems experienced with malfunctioning septic systems result from a lack of coordination between these two systems of regulation or from authorities giving the development process priority over the environmental protection process. The mandates of the two regulatory systems and their administrators often appear to conflict. Development is seen as a source of jobs, wealth creation, and increased municipal and provincial tax revenue, while environmental protection places constraints on this development and is perceived as imposing costs on developers and purchasers without commensurate financial benefits.

As a result, land-use planning approvals have frequently been granted to sever, subdivide, or develop lands that are not suitable for the use for which they have been zoned because they cannot support a septic system and the area is not serviced by municipal sewers. These lots are generally too small to hold a septic system adequate to meet current standards for the size and location of such systems.

In other cases, however, the size and location standards themselves are inadequate to prevent pollution. For example, Ontario's regulations provide that septic system disposal fields must be at least 50 feet from a dug well and 100 feet from a drilled well or watercourse. The tiles must generally be at least 3 feet above ground water. However, these setbacks may often be inadequate, because there is evidence that pathogenic bacteria and viruses may migrate and remain viable through greater distances.[31] Although legislation often states that these setbacks are minimum distances that can be increased where local conditions warrant greater setbacks, they are often applied mechanically, because regulators often have insufficient knowledge of soil conditions and other variables and of the relevant scientific considerations to justify imposing greater setbacks.

It has been suggested that the most important factor influencing groundwater contamination by septic tanks is the density of systems in an area. The densities allowed under most current Canadian regulations are far greater than those considered appropriate. The US EPA has designated areas with septic system densities of greater than 40 systems per square mile (1 system per 16 acres) as regions of potential groundwater contamination.[32] In the past, however, the generally recognized legal minimum lot size for septic systems in the United States has been about 0.47 acres.[33] This is similar to the minimum size lot that would be allowed, for example, under Ontario's current regulations.

It follows, therefore, that one of the simplest ways to reduce the number of problems in future septic system approvals is to increase the minimum size of lot that would be approved for any use that would require a septic system. However, regulating lot size alone will not prevent problems, because there are many variables such as slope, soil porosity, watertable height, and other aspects of environmental sensitivity that affect the functioning of septic systems. A more complex but more scientific method of achieving the same goal would be to require more systematic study of the characteristics of each individual site, including soil porosity, soil depth, and groundwater fluctuations, rate, and direction of flow, rather than the more-or-less mechanical application of legislated formulas to each site, regardless of potential environmental differences.

The problem of existing substandard tanks has largely not been addressed by Canadian regulations. Unlike the laws regulating underground gasoline tanks, regulations governing septic systems generally contain no requirements to upgrade or replace the systems unless and until they actu-

ally malfunction or a major change is made in the use of a parcel of land that will impose additional loadings on the existing system.

As mentioned earlier, many of the existing systems have reached or are rapidly reaching the end of their expected life. Moreover, many of these systems are currently handling much larger loadings of sewage than they were designed for as a result of lifestyle changes that have increased water usage, such as larger houses, automatic washers, whirlpools, and more fixtures per person than in past. Many cottages built for seasonal use with sewage systems designed to handle seasonal loadings have been converted to year-round use, with the result that loadings have increased beyond their capacity.

Moreover, like petroleum tanks, many of the older septic tanks are made of unprotected steel, which will eventually corrode, just as the petroleum tanks did. Yet there are generally no requirements to provide cathodic protection to such tanks or install leak detection devices, or any limit on how much longer they may remain in the ground.

There is another similarity to most petroleum tank regulations. Although septic system installers must be licensed in most provinces, there are often no requirements that designers or installers meet specific standards of competence to obtain a licence. This is particularly important since it has been estimated that about 31 percent of leaching bed failures result from poor design, poor construction, and inaccurate soils information, all of which could be improved by ensuring the competence of designers and installers.[34] One study of septic systems in Ontario recommended that only qualified engineers be permitted to design, inspect, and certify private sewage systems within plans of subdivision.[35] However, it would be necessary to determine what constitutes competence and to determine through testing and monitoring of performance whether persons licensed to carry out these functions have the required competence. It is interesting to note in this regard that the septic systems that failed in several Ontario housing subdivisions were, in fact, designed by professional engineers.