

# Background Papers

*An environmental agenda  
for Ontario for the year 2000  
and beyond*

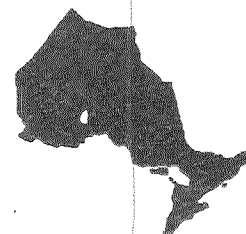


## An Environmental Agenda for Ontario

*A project of Ontario's Environmental Community*

CIELAP Shelf:  
Canadian Institute for Environmental Law and Policy;  
Anne C. Bell & Jerry V. DeMarco; Brennain Lloyd &  
An Environmental Agenda for Ontario : A project of  
Ontario's Environmental Community - Background

RN 27175



April.99



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**PROTECTING, CONSERVING AND RESTORING  
BIODIVERSITY IN ONTARIO**

**By Anne C. Bell & Jerry V. DeMarco**

**Prepared for**

**The Environmental Agenda for Ontario Project**

**March 1999**

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## SUMMARY

### **Current Status**

This paper deals with the protection, conservation and restoration of biodiversity in Ontario. Biodiversity or biological diversity refers to the intricate weave of Earth's living organisms, their interrelationships and habitats, the genetic differences among them, and the ecological processes which sustain them.

It is widely acknowledged that we are presently experiencing, on a global scale, the first mass extinction since the disappearance of the dinosaurs 65 million years ago, and the first ever induced by the activities of a single species - our own. In Ontario, a number of species have gone extinct at the hands of humans while many others are endangered. Likewise, numerous natural communities and ecosystems such as wetlands, old-growth forests and prairies have been greatly reduced in extent. Many ecological processes have also been impaired or endangered, resulting in such impacts as increased run-off, soil erosion, reduced rates of nutrient uptake, lack of pollination, eutrophication of water-bodies and changes in species composition. The loss of genetic diversity, though not as apparent as species diversity, will have serious consequences on the ability of species to adapt to new stresses such as climate change and the introduction of non-native species.

### **Causes of Problem**

Biodiversity loss includes all those changes that have to do with reducing or simplifying the diversity of life on a local, regional, provincial, national or global scale. Dealing with biodiversity loss will require efforts at all of these levels. For the purposes of this discussion, however, the focus is provincial. We examine biodiversity loss in terms of both immediate on the ground threats and institutional shortcomings, since these, we believe, can realistically be dealt with now by the government of Ontario. While each type of threat or shortcoming is discussed separately, in practice it is often a combination of threats that leads to specific examples of biodiversity loss. The key threats include: habitat loss and fragmentation, toxic substances, commercial and recreational use, non-native species, and global trends such as climate change. The institutional shortcomings discussed are in the following areas: decision-making processes, the legislative regime, policy and programme limitations, and ministerial jurisdiction.

### **Agenda for Change**

The paper sets out the following comprehensive vision for protecting, conserving and restoring biodiversity in Ontario:

#### **General Vision:**

The entire array of biodiversity values is maintained across the province and where possible restored, and henceforth is permitted to evolve naturally into the future.

### Specific Components:

- Ecological processes and evolutionary changes are permitted to carry on without human interference.
- The populations and ranges of all current species at risk (vulnerable, threatened, endangered or extirpated) are recovered to self-sustaining levels.
- No further species are threatened, endangered or extinguished as a result of human activity.
- A permanent system of protected areas free from industrial use is established which represents all natural regions and features of the province, permits natural disturbances to continue, and harbours adequate habitat for all native species.
- Significantly degraded habitats and natural communities greatly reduced in extent are restored to healthy levels.
- Unique, rare and significant features are given recognition and permanent protection.
- The introduction of further non-native species is halted, and those that are already present and adversely affecting native species are brought under control.
- The stewardship of private lands fosters the protection of biodiversity.
- The management of public lands open for industrial use sustains biodiversity at the local, regional and provincial levels.
- Laws protecting biodiversity are enforced and applied equally to all, and used to support conservation action.
- Adequate government resources and incentives are put towards sustaining biodiversity.
- The public possesses a broad awareness of the importance of ecosystems, natural communities and biodiversity in general and that awareness is reinforced through the education system.
- Broad community action to support conservation exists.
- The release of contaminants that harm biodiversity is virtually eliminated.
- Ecological sustainability is, in policy and practice, the overriding priority of all levels of government and the public.

### Key Recommendations

The paper makes a number of recommendations to help achieve the above vision for biodiversity in Ontario. The recommendations are broken down into six key areas for change:

- Protecting key elements of biodiversity: completion of the protected areas system; programmes to protect wildlife, including species at risk; protection of ecological processes.
- Sustainable use: improved resource use practices; private stewardship and acquisition; ecological restoration.
- Addressing threats: control of non-native species; reduction and elimination of toxic substances.

- Legislative reform: stronger legislation; enforcement and implementation of laws, regulations and policies.
- Improved understanding: research and monitoring; education.
- Organizational reform: holistic, consistent planning frameworks; public participation; government reorganization.



#### Authors:

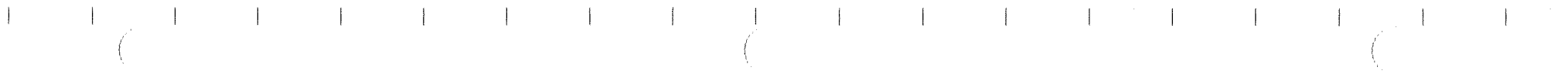
Anne C. Bell is a doctoral candidate at the Faculty of Environmental Studies at York University. Her areas of research include ecological restoration, environmental education and biological conservation. She serves as a Director of the Wildlands League chapter of the Canadian Parks and Wilderness Society.

Jerry V. DeMarco is a staff lawyer and Registered Professional Planner with the Sierra Legal Defence Fund. Mr. DeMarco holds undergraduate degrees in law and geography and a master's degree in environmental studies.

#### Acknowledgments:

The authors gratefully acknowledge the information and insight provided by the following individuals and organizations:

John Ambrose (Toronto Zoo), Sheri Armstrong (Nature Conservancy of Canada), Ian Attridge, Catherine Austen (Canadian Nature Federation), Grant Casey, Tom Clark, Kathy Cooper (Canadian Environmental Law Association), Deb Doncaster (Animal Alliance of Canada), Pegi Dover (World Wildlife Fund Canada), Stewart Elgie (Sierra Legal Defence Fund), Helen Forsey, Andy Frank (Great Lakes United), Bob Gibson, Tim Gray (Wildlands League), Heather Hamilton (Canadian Biodiversity Institute), R. Harmsen (Collins Watershed Association), Brennain Lloyd (Northwatch), Naomi Lloyd (Centre for Indigenous Environmental Resources), Chris Lompart (Federation of Ontario Naturalists), Patricia Lowe (Friends of Second Marsh), Bruce Mackenzie (Wildlands League), Don McAllister (Ocean Voice International), Connie Nelson (Lakehead University), Bruce Petersen (Environment North), Linda Pim (Federation of Ontario Naturalists/ Coalition on the Niagara Escarpment), Victoria Taylor (Evergreen Foundation), Jason Thorne, Ken Towle (Association for Biodiversity Conservation), Sandra Turner (Nature Conservancy of Canada), Doug van Hemessen (Carolinian Canada), Elizabeth Wharton (Pesticide Action Group), Liz White (Animal Alliance of Canada), Mark Winfield (Canadian Institute for Environmental Law and Policy) and all those who participated in the Ontario Environment Network biodiversity workshop in Hamilton.



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# PROTECTING, CONSERVING AND RESTORING BIODIVERSITY IN ONTARIO

## INTRODUCTION

This paper deals with the protection, conservation and restoration of native biodiversity in Ontario. Lying at a crossroads of the Great Lakes and Hudson Bay, the prairies and temperate forests, and the bedrock of the Canadian Shield and the glacial till plains of the south, Ontario harbours a great variety of landforms and attendant natural communities. Along with this wealth of biodiversity comes the important responsibility to safeguard it.

Biodiversity, or biological diversity, refers to “the variety of life and its processes. It includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting.”<sup>8</sup>

It is widely acknowledged that we are presently experiencing, on a global scale, the first mass extinction since the disappearance of the dinosaurs 65 million years ago, and the first ever induced by the activities of a single species - our own.<sup>9</sup> In Ontario, a number of species have gone extinct at the hands of humans while many others are endangered. Likewise, numerous natural communities and ecosystems such as wetlands, old-growth forests and prairies have been greatly reduced in extent. Many ecological processes have also been impaired or endangered, resulting in such impacts as increased run-off, soil erosion, reduced rates of nutrient uptake, lack of pollination, eutrophication of water-bodies and changes in species composition.<sup>10</sup> The loss of genetic diversity,<sup>11</sup> though not as readily apparent as declining species diversity,

### Statistics and Trends

#### *Global:*

- present rate of extinction worldwide: about 400 times that recorded through recent geological time, and the rate is accelerating<sup>1</sup>
- a loss of 15 to 20 percent of all species by the year 2000 is projected<sup>2</sup>

#### *Canada:*

- an estimated 100 hectares of wild lands and wild waters lost to industrial development per hour<sup>3</sup>
- 285 species and populations known to be at risk nationally; a further 22 species listed as extinct or extirpated

#### *Ontario:*

- 5 major natural regions: Carolinian Forest, Great Lakes-St. Lawrence Forest, Boreal Forest, Hudson Bay Lowlands, and Tundra<sup>4</sup>
- approximately 2900 vascular plant, 458 bird, 57 reptile and amphibian, 86 mammal, 158 fish, 137 butterfly species<sup>5</sup>
- at least 5 extinct species, including three fish species unique to the Great Lakes
- about 50 species extirpated since European colonization including Karner Blue butterfly, Timber Rattlesnake
- about 25 animal and 190 plant species vulnerable to extirpation<sup>6</sup>
- specific communities under threat include wetlands, prairies<sup>7</sup> and old-growth forests

will seriously impair the ability of species to adapt to new stresses such as climate change and the introduction of non-native species.

The desire to maintain biodiversity in the face of such loss reflects the understanding that organisms and natural processes should be protected both for their inherent value and for their importance in sustaining and nourishing humankind. It testifies to a deeply felt sense of responsibility towards the web of life and its intricate, delicate weave. As part of that web, humans have an obligation to ensure the good of the whole. This means seeing to our own welfare; it also means that in so doing we must not interfere with the ability of other species and communities to exist and thrive. They matter for their own sake, regardless of their known utility to humans.

Biodiversity supports the integrity and resilience of the ecological systems upon which all life ultimately depends.<sup>12</sup> Humans enjoy and rely on the many benefits provided by the life forms and processes integral to maintaining the hydrologic cycle, creating soil, purifying the air and water, increasing soil productivity, disposing of waste, pollinating crops, harnessing energy from the sun, regulating the climate and so on. We depend on biodiversity for food and medicine and the very possibility of engaging in such endeavours as agriculture, forestry, hunting, fishing and recreation. A source of spiritual and aesthetic contemplation and inspiration, the diversity of life on Earth enriches all human cultures in countless ways.

The goal of maintaining biodiversity is well accepted in principle by governments at the municipal, provincial, federal, aboriginal and international levels. Industries, labour groups and non-government organizations have likewise pledged their support in a variety of forums.<sup>13</sup> Various polling data show that the people of Ontario at large, though perhaps not familiar with the term biodiversity, support the essence of biodiversity protection through their staunch backing of protected areas and efforts to protect wildlife and endangered species.<sup>14</sup>

This support notwithstanding, our failure to stem the tide of biodiversity loss in Ontario points to the inadequacy of our efforts thus far. It requires that we renew our resolve and seek out more promising ways of proceeding. Conventional approaches to conservation

#### Provincial Government Commitments to Biodiversity

The need to protect species and their habitats has been acknowledged time and time again by the Ontario government through commitments such as: *A Wildlife Policy for Canada* (1990), *Looking Ahead: A Wild Life Strategy for Ontario* (1991), *Statement of Commitment to Complete Canada's Networks of Protected Areas* (1992), *Convention on Biological Diversity* (1992), *Policy Framework for Sustainable Forests* (1994), *Canadian Biodiversity Strategy* (1995), *National Accord for the Protection of Species at Risk* (1996), and *Nature's Best* (1997).

The government's willingness to live up to these commitments has yet to be demonstrated. For example, many of the province's natural regions have little or no protected area representation, and the list of species at risk continues to grow. The biodiversity agenda has not been immune to the political tendency to commit but not implement.

and resource management, which generally have focused on only one or a few species (typically those of commercial interest) have proven to be overly simplistic.

The incremental impacts of, for example, agricultural, industrial and transportation processes have often fallen outside the ambit of concern until irreversible harm occurs. Management systems have also tended to separate human and non-human spheres, thus failing to adequately take into account the effects of the lives we humans lead upon the life forms we seek to conserve and on whom we depend.

In contrast, the very concept of biodiversity carries “an imperative to consider the complexity of ecosystems” and to proceed with caution in the face of our lack of knowledge.<sup>20</sup> Consequently, strategies to protect biodiversity must be premised on the interdependence among species, communities, habitats and natural cycles and undertaken from a holistic perspective, recognizing the limits of humankind’s ability to manage complex ecological interrelationships and acknowledging the close links between biological and cultural diversity.

## **BIODIVERSITY LOSS**

Biodiversity loss includes all those changes that have to do with reducing or simplifying the diversity of life on a local, regional, provincial, national or global scale. Dealing with biodiversity loss will require efforts at all of these various levels. For the purposes of this discussion, however, the focus is provincial. We examine biodiversity

loss in terms of both immediate on the ground threats and institutional shortcomings since these, we believe, can realistically be dealt with now by the government of Ontario. In so doing we recognize, of course, that we are passing over the ultimate, deeper causes

### **The Importance of Cultural Diversity**

Biological and cultural diversity are interdependent. Not surprisingly then, where cultures have been displaced, biodiversity is also at risk: “Wherever empires have spread to suppress other cultures’ languages and land-tenure traditions, the loss of biodiversity has been dramatic.”<sup>15</sup>

According to the World Resource Institute’s Global Biodiversity Strategy: “Humanity’s collective knowledge of biodiversity and its use and management rests in cultural diversity; conversely conserving biodiversity often helps strengthen cultural integrity and values.”<sup>16</sup>

Aboriginal peoples looking to restore, conserve and regain control over their environment are able to draw from traditional teachings and practices. A recent report, based on four aboriginal communities across Canada, indicates that they are breaking new ground in their efforts to protect biodiversity by putting biodiversity in a broader context which includes community, economic and ecosystem health.<sup>17</sup>

In Ontario, as elsewhere in the country, significant natural areas are to be found on the lands of First Nations peoples. For instance, Walpole Island, at the mouth of the St. Clair River, is unsundered territory where native traditions and philosophies have resulted in the preservation of oak savannah and tall-grass prairie of international significance.<sup>18</sup> There these endangered plant communities are managed and maintained with fire, and harbour ninety-seven provincially rare plant species.<sup>19</sup>

of biodiversity loss (e.g., over-consumption, loss of cultural diversity, human overpopulation) whose remedies lie with more fundamental, long-term change. Nevertheless, the problems listed below must be addressed if the government of Ontario intends to do its part in maintaining biodiversity. While each type of threat is discussed separately, in practice it is often a combination of threats that leads to specific examples of biodiversity loss.

### Problems on the Ground

The immediate problems described here are proving devastating to biodiversity in Ontario as in every part of the world. All require action at the provincial level though some (e.g. habitat fragmentation and loss) lend themselves more easily to provincial control than others (e.g., global trends). Even in the case of transboundary problems such as climate change and ozone depletion, however, the government of Ontario can and must do its part by working on and honouring federal and international initiatives (e.g., international agreements concerning biodiversity, ozone depletion, climate change).

### Habitat Loss and Fragmentation

Habitat loss is the greatest cause of declining biodiversity.<sup>24</sup> Simply put, native species cannot survive in the wild unless their habitat - their home - is protected. The isolation of remaining habitats through development practices that fragment the landscape (roads, urbanization, agriculture, logging operations, hydro corridors) further contributes to loss of biodiversity, and in fact may be one of the primary causes of the present extinction crisis.<sup>25</sup> Fragmented pockets of habitat, though useful for many species, are not sufficient for those organisms that require large home ranges, have complex life cycles or are sensitive to human disturbance.<sup>26</sup> When habitat is fragmented, populations of a particular species can become isolated, leading to inbreeding and a loss of genetic diversity; this loss reduces a species' ability to adapt to other types of environmental stresses.<sup>27</sup>

Unfortunately, habitat fragmentation is a defining characteristic of the settled landscape of southern Ontario.<sup>28</sup> These fragments harbour many species that are regionally and

### Karner Blue Butterfly

The destruction of more than 99% of savannahs in southern Ontario<sup>21</sup> has led to the extirpation of the Karner Blue butterfly. A classic example of species interdependence and the impacts of habitat loss, trouble started when the Karner Blue caterpillar's only food source, wild lupine, began to disappear with the loss of oak savannah through development, disturbance by humans and extensive planting of pines.<sup>22</sup>

Recovery plans for the Karner Blue began in 1993. The project aims to restore and protect oak savannah habitat and to better understand the relationships between plant and insect species within the habitat. It involves a 5-year captive breeding program (at the Toronto Zoo), species and habitat inventories, development of habitat quality indices and the reintroduction of the Karner Blue. Recovery efforts will benefit the entire ecosystem including the approximately 70 other significant species found there.<sup>23</sup>

The Karner Blue's decline also demonstrates the need for a more timely, objective and scientific listing process under Ontario's *Endangered Species Act*. By the time politicians got around to listing it under the Act, it was already too late to prevent its extirpation.

provincially rare. “For example, in the Rouge Valley Park at the eastern boundary of Toronto, 22% of the native flora and 32% of the breeding birds are considered rare, most of them because of the reduced extent of natural habitat in the surrounding region.”<sup>29</sup> On the settled landscapes of the south there is a special case to be made for the conservation of all remaining woodlands. Once the dominant habitat in the region, woodlands have been reduced to rarity in some areas (e.g., woodland landscapes in Essex County are now 3%; Kent County, 4.2%; Perth County, 9%)<sup>30</sup> and continue to decline in the Carolinian life zone.<sup>31</sup> Even in those parts of southern Ontario where forest cover has been increasing in the past 50 years, the average age of the forest stands has dropped, woodlands are being downsized, simplified and fragmented, and key forest species are in decline.<sup>32</sup>

As one travels north, large-scale industrial forestry practices give rise to a dramatic and accelerating rate of change towards younger, more divided and less varied forests, and biodiversity is increasingly at risk. Not surprisingly, the range of species that rely on large tracts of mature forests, such as woodland caribou, is retreating in step with the northward advance of industrial development. “Logging roads are a particular problem. These road networks are rapidly expanding into remote wilderness areas in order to reach a declining timber supply. Once built, they continue to provide avenues for hunters, anglers, and others into previously inaccessible wilderness - increasing the strain on formerly well-protected plant and animal communities.”<sup>35</sup> There are over 33,000 km of forest access roads for logging in Ontario leading to an ever increasingly fragmented landscape.<sup>36</sup>

The loss and fragmentation of habitat has resulted not simply in vastly diminished ranges for many species (e.g., caribou, wolves, bears), it has also caused the expansion of many others (e.g. deer, cowbirds). Both of these changes in the distribution of species fundamentally disrupt natural communities. While change is a given in the evolutionary nature of biodiversity, the rapid pace and large scale of the changes brought by humans have outstripped the ability of many species to adapt, resulting in severe disruptions to biodiversity and the endangerment and extinction of entire species. For example, a recently identified threat of our ever-expanding urban environments involves the fatal collisions of birds with human-built structures, an impact caused by, among other things, light pollution and windows.<sup>37</sup> These birds have simply not been able to adapt to the rapid rise of cities. Recognizing that some change is inevitable, we must ask: what are the causes and consequences of the change and how can *we* change so that biodiversity decline can be halted?

#### **Habitat Fragmentation and Edge Effects**

While habitat loss is a well-known cause of biodiversity loss, habitat fragmentation is of equal concern. “The greater the degree of fragmentation of natural habitats within the landscape, the lower is its capacity to maintain biodiversity.”<sup>33</sup> “When natural areas are fragmented, interior-dwelling species are presented with a habitat edge exposing them to numerous edge effects. These include:

- Increased solar radiation.
- Greater extremes in temperature and humidity.
- Increased wind and desiccation.
- Increased predation and parasitism.
- Increased presence of non-native, competitive species, and pathogens.
- Increased disturbance from noise, water and air pollution, motorized vehicles, vegetation clearing and

#### **Toxic Substances**

Discharges and emissions of toxic substances into the air and water and onto land can harm or kill organisms and devastate natural communities.<sup>38</sup> Dispersed through activities in agriculture, forestry, mining and other industries, and by municipalities and individuals, these substances are weakening and destroying the bases of major food webs and having major negative impacts on the quality of air, water and land required for the health of all beings.<sup>39</sup> Thousands of acid lakes in northern Ontario, rendered essentially lifeless by airborne pollutants, are testimony to the damage that can be done.<sup>40</sup> In the Great Lakes, a wide range of toxic contaminants is present,<sup>41</sup> affecting the growth, reproductive and hormonal systems of humans and non-humans alike.<sup>42</sup>

Pesticides are an example of contaminants deliberately introduced into the environment that have played a significant role in the decline of species and the loss of habitat diversity. They may interfere with or cause the breakdown of fundamental biogeochemical processes that support life, including decomposition, mineral oxidation, nitrogen fixation and photosynthesis.<sup>43</sup> They are also highly toxic to soil fauna.<sup>44</sup> Urban use of chemical pesticides and fertilizers is one example. Agricultural landscapes are also of concern,<sup>45</sup> especially in southern Ontario where farming is intensive and habitat has been severely depleted.<sup>46</sup> Throughout the province, forestry spray operations are a problem, particularly for non-target species in areas adjacent to or near a sprayed area. Since pesticides can travel far from their original application site through air, water, and soil, their impacts are widespread.<sup>47</sup>

### **Commercial and Recreational Use**

The direct harvest of wild plants, fish and wildlife for commercial use in Ontario includes logging, trapping and fishing. To a lesser extent it also includes the illegal hunting of bears for traditional Asian medicines. Aside from direct mortality to the individuals being harvested, commercial exploitation can also lead to significant population declines, extinctions and loss of genetic diversity.<sup>48</sup>

Commercial fishing, coupled with a wide array of environmental stresses, has contributed to the decline of many species (e.g., Atlantic salmon) in the Great Lakes basin.<sup>49</sup> Commercial logging has resulted in significant changes in the composition of the Boreal Forest (especially loss of conifers) and a severe decline in old-growth forests (especially in the Carolinian life zone and in red and white pine forests). These changes, in turn, have resulted in population declines in the many species that rely on these habitats. In some cases, certain resource interests that benefit from these changes may discourage the government from trying to adopt a more ecological approach to land and resource management and instead encourage, for example, a timber or game focused approach.

Both consumptive (e.g., fishing, hunting) and non-consumptive (e.g., camping, hiking, mountain-biking) recreation can disturb and destroy plants, fish, wildlife and habitat. The most obvious examples are overhunting and overfishing. Technological advances (fish finders, all-terrain vehicles, night scopes, infrared binoculars, radios, global positioning systems) and increased access through forestry roads greatly augment the impact of these user groups. In addition, Ontario Ministry of Natural Resources (MNR) policies and

procedures for sustaining big game species such as moose, deer and bear have been found to be insufficient in ensuring the sustainability of these species. For example, a 1996 study found that the number of moose was well below the sustainable population target levels in 93% of all wildlife management units within the core moose range.<sup>50</sup>

Meanwhile, the stocking of non-native fish species (e.g., salmonids) by government agencies catering to recreational users still persists despite evidence of negative impacts to native biota.<sup>51</sup> The overuse of an area by less consumptive recreationalists can also have a negative impact on biodiversity through disturbance, trampling, erosion, etc. For instance, of recent concern are the impacts of personal watercraft (jet skis<sup>TM</sup>) that disturb nesting sites and discharge huge amounts of oil directly into waterways.<sup>52</sup>

### **Non-native Species**

Whether accidental or deliberate, the introduction of non-native organisms can seriously disrupt natural habitats and lead to the endangerment and extinction of species.<sup>53</sup> When a non-native species establishes itself in a new habitat, controls on its population, such as predators and disease, are often not in place. These organisms may eventually overpopulate, disrupting normal interactions among native species and causing the host community to become unstable.

Few if any natural communities in Ontario have retained their original species composition since European colonization of the area. Non-natives such as Dutch elm disease, chestnut blight, European starling and gypsy moth have all had significant and long-term effects on Ontario's biodiversity.<sup>55</sup> Over 140 species, including sea lamprey and zebra mussel, have been introduced into the Great Lakes with devastating impacts on native populations and consequently on the fisheries.<sup>56</sup>

Much like non-native species, organisms modified by genetic engineering (OMGE) could pose risks to biodiversity.<sup>57</sup> For example, genetic diversity within a species could be compromised if novel traits enabled an OMGE to become more invasive of natural habitats or to competitively displace other species. The transfer of genes from an OMGE to a wild relative could result in changes to the genetic structure of wild populations, with unforeseeable consequences.<sup>58</sup> Further controls at the federal level will be required to reduce the risks associated with OMGE.<sup>59</sup>

#### **Zebra Mussels**

The zebra mussel is a non-native species accidentally introduced into Lake St. Clair in 1988. Its explosive growth since then is believed to threaten the ecological integrity of the Great Lakes as well as shipping and sport and commercial fishing. The zebra mussel has the potential to disrupt the food web by voraciously feeding on the microscopic plants needed by aquatic grazers and the larval and juvenile stages of many species of fish. Already there is evidence of reduced growth rates of perch and of the rapid elimination of native North American freshwater clams. Long-term ecological impacts are unknown.<sup>54</sup>

### **Global Trends**

Global trends such as climate change and ozone depletion - the by-products of industrial activities and modern lifestyles - promise to have devastating impacts on the planet's

biodiversity. The ozone layer protects life on Earth from deadly ultraviolet rays; its current depletion by synthetic substances such as CFCs is already implicated in the worldwide decline of amphibians and in human health problems. Climate change is suspected to underlie many recent severe weather events that have likewise taken their toll on human and other life.

It is impossible for scientists to prove beyond a doubt the impacts of these global trends on biodiversity. Nevertheless, there is mounting scientific agreement of impending trouble. For instance, according to Harvard scientist E.O. Wilson, "if even the more modest projections of global warming prove correct, the world's fauna and flora will be trapped in a vise."<sup>60</sup>

It is expected that climate change will have a greater than average impact on the biotas of the cold temperate and polar regions - in other words, on the natural communities of places like Ontario. As Wilson explains:

A poleward shift of climate at the rate of 100 kilometres or more each century, equal to one metre or more a day, is considered at least a possibility. That rate of progression would soon leave wildlife preserves behind in a warmer regime, and many animal and plant species simply could not depart from the preserves and survive.<sup>61</sup>

Furthermore, organisms in the tundra and polar seas will have no place to go, even with a modest amount of global warming. All the species of high latitudes risk extinction, particularly if they are restricted to low-lying coastal areas (e.g., James Bay), as these will be flooded when the sea rises from the melting of polar ice.<sup>62</sup>

### **Institutional Shortcomings**

In this section we examine some of the ways that our provincial government and we as a society are organized to deal with environmental concerns. We consider aspects of decision-making processes, the legislative regime, policy and programme limitations, and ministerial jurisdiction. Overall, the picture is alarming. The steps we have taken so far to sustain biodiversity in Ontario are not only inadequate, but have been seriously undermined in recent years.

### **Decision-making Processes**

**Failure to acknowledge the importance of biodiversity in decision-making:** The government has placed little emphasis on the environmental implications of recent and proposed changes to provincial policies and laws. For example, efforts to streamline the land use planning process resulted in changes to the *Planning Act* that lessened protection for significant habitat areas. Short-term economic concerns have taken precedence over nearly all other considerations. In Ontario, recent budget and staff cuts to both the natural resources and environment ministries have been particularly severe, reflecting the low priority these areas are to the government. While lip-service is continually paid to the



necessary buzzwords (e.g., sustainability, doing more with less), it is evident that environmental considerations, including biodiversity concerns, are not a government priority. The Environmental Commissioner of Ontario (an independent environmental watchdog appointed by an all-party committee of the Legislature) notes that only three ministries mention environmental responsibility in their business plans and that:

Unfortunately, commitments that ministries have made to the environment in their Statements of Environmental Values are not reflected in the majority of the 1997 business plans, which are even weaker than last year's in terms of integrating the environment into ministry business. Mention of the environment has also been deleted from the vision, mission statements, or strategic directions set forth by many ministries in their 1997 business plans.<sup>64</sup>

At a time when public concern for environmental protection remains high and appears to be growing, the government is tending to put environmental considerations at or near the bottom of its agenda. This institutional and governmental failure to reflect the concerns of the citizens of Ontario erects many barriers to the protection of biodiversity and the environment in general.

**Information deficiencies:** The lack of quality baseline information about biodiversity can seriously hamper conservation efforts. Information gathered through environmental monitoring is key to good environmental decision-making and to evaluate the effectiveness of conservation programs.<sup>65</sup>

In her review of government environmental monitoring programmes, however, the Environmental Commissioner found that "significant environmental information is not being collected, or if it is being collected, is not being analyzed and reported."<sup>66</sup> Even where information exists, it is not being used fully to bring about environmental improvement.<sup>67</sup> The MNR, for example, "has few population surveys for small game species or non-game wildlife, or population estimates for most wildlife species that are vulnerable, threatened or endangered"<sup>68</sup> and has come under recent criticism for the mismanagement of those species typically given greater management attention.<sup>69</sup> The Ministry is also failing to analyze data on big game mortality and to produce provincial or regional reports.<sup>70</sup>

#### Woodland Caribou

The forest-dwelling woodland caribou is an excellent indicator of the systemic effects of large-scale industrial development. A review of its historical and current range and the forestry industry's northward advance leads to a troubling conclusion. In historic times, Champlain noted caribou (rather than deer) along the upper Ottawa and French-Nipissing waterways.<sup>63</sup> At present the southern limit of the caribou's contiguous range is much farther north and roughly coincides with the northern limit of industrial forestry. The slow and largely publicly unnoticed retreat of the caribou, with no obvious direct mortality from humans or massive visible die-offs, has allowed the government to ignore the problem. Industry preferences for forestry road access and large-scale clearcutting have trumped the need for protected areas and ecologically sustainable resource use.

These information deficiencies underline, not only the need for better monitoring and reporting, but also the need to adopt a precautionary approach when planning and implementing conservation measures. While lack of information should not be used as an excuse to avoid action, it does suggest that a large margin for error must be allowed when, for example, designing protected areas, limiting toxic emissions, or dealing with so-called overabundant species.

#### **Traditional Ecological Knowledges**

Of great promise to decision-making processes are the traditional ecological knowledges of aboriginal peoples. As environmental problems worsen, these knowledges are increasingly recognized as valuable to conservation because they combine current observation and experience with knowledge acquired over thousands of years of direct human contact with specific environments.<sup>71</sup>

One example has been the conservation and traditional harvest of wild rice at Mud Lake, near the village of Ardoch, by local Metis and Indians. Before colonial settlement, most of the wetlands and waterways of southeastern Ontario hosted profuse stands of wild rice, which were cultivated by aboriginal peoples for thousands of years. In the last century, however, canal systems, pollution, exotic species like carp, and the use of motorized airboats to harvest the rice depleted or destroyed most of the wild rice stands in this part of the province. With this loss, traditional wild rice harvesting itself faded. One exception though was a wild rice stand at Mud Lake nurtured by an Algonquin family. Today the rice continues to be managed and gathered according to the traditional methods that have so far ensured its conservation.<sup>72</sup>

#### **Impediments to public review and participation:**

As the Environmental Commissioner noted in her 1996 and 1997 *Annual Reports*, there have been profound changes to the environmental regulatory system in recent years. Amendments are pending or have been made to almost half the statutes and regulations prescribed under the *Environmental Bill of Rights (EBR)*.<sup>73</sup> Unfortunately, the rapid pace of change, the sheer number of changes proposed within a short period, and lack of consultation have often impinged upon the public's ability to review or participate in the decisions that have been made.

Public participation in environmental decision-making helps to broaden perspectives, prevent oversights, enhance public support and provide important opportunities to draw upon local knowledge and expertise. Unfortunately the MNR has recently made moves to limit such public involvement. Under the *EBR*, ministries must classify the instruments (the legal documents of approval granted by ministries before companies or individuals can carry out activities that can have an impact on the environment) they issue according to how environmentally significant they are. This determines the type of approvals that will be posted on the Registry for public comment and

the extent of the opportunities there will be for public participation, appeal, review and investigation. As the Environmental Commissioner pointed out, however, the MNR is "using an *EBR* exception to remove many of the ministry's instruments from public scrutiny, and is proposing another regulation that defines certain instruments as 'field orders,' removing them as well from many of the *EBR*'s public participation processes." As a result, members of the public will not be able to comment on MNR proposals to

grant a forest license, or on proposals to supply forest resources to an individual or company. This move on the ministry's part, which will limit public scrutiny and comment, does not comply with the intent of the *EBR*.<sup>74</sup>

**Aspects of biodiversity that do not qualify as significant for protection:**

Government and non-government conservation programmes tend to focus their efforts and resources on significant species and landscapes. What is deemed significant is often a question of scale - regionally significant, provincially significant, nationally significant and so on. While it is no doubt important to consider significance from these perspectives, the conservation of biodiversity also requires a more encompassing viewpoint. Significance, on a provincial scale, for example, may cause us to ignore (and fail to allocate adequate protection to) natural features of regional or local significance.

One of the weaknesses of conservation programmes traditionally has been the tendency to focus on large game and charismatic species. Falling outside the ambit of concern have been non-game wildlife, invertebrates and most plants.<sup>77</sup> Little information has been gathered about these species and the few existing research and recovery plans have been severely limited by funding constraints.

In terms of habitat protection, the Ontario government has used the standard of significance to cut back on its conservation responsibilities. For example, with the Omnibus Bill (*Savings and Restructuring Act, 1995*), the government decided to limit its funding to Conservation Authorities by granting tax rebates only for lands deemed provincially significant (i.e., provincially significant wetlands, provincially significant Areas of Natural and Scientific Interest, Niagara Escarpment Natural Areas and Agreement forests). Since only 40% of Conservation Authority lands enjoyed this formal designation, the remaining 60% were left essentially unfunded. More recently, the MNR has asked regional district managers to identify Crown lands that are no longer needed and not environmentally significant so that they can be sold.<sup>78</sup>

**"Overabundant" Species**

When numbers of a particular wildlife species rise, that species can be regarded as "overabundant." Recent examples in Ontario include Canada geese, double-crested cormorants and snow geese, all of which have provoked considerable animosity and concern. Ironically, in the past these species were targets of conservation initiatives. Now they are targets of proposals to drastically reduce their numbers.<sup>75</sup> At the turn of the century, for example, hunting of Canada geese resulted in a dramatic reduction of their numbers, and one sub-species, the Giant Canada goose, was thought to have been reduced to near extinction. The Canada goose was subsequently the subject of extensive Canada/U.S.A. conservation programmes. Today, the Canada goose is regarded as "overabundant" in many urban areas and is subject to a variety of control measures.<sup>76</sup>

The issue of overabundant species raises questions about our knowledge of historic population trends and dynamics and about our presumption to manage wildlife populations when the implications of such management are not clearly understood. Ironically, the so-called overabundance is symptomatic of human-induced changes to the landscape (e.g., agricultural fields, woodland edge, wide expanses of lawn), which favour the species in question.

The significance standard is also being used by the government to justify its minimalist approach to completing the provincial protected areas system. In the Lands for Life process, the MNR's approach has thus far been to identify only "minimum representative core areas" for protection<sup>79</sup> and to preserve only one small example of old growth forest per site district.<sup>80</sup> While chosen sites will no doubt be significant and worthy of protection, their designation leaves the rest of the landscape open to industrial development and, on Crown lands, the possibility of long-term perpetual tenure by the forest industry.

### **Legislative Regime**

**Current laws:** Significant gaps in protection are evident in the existing legislative scheme. For example, while the destruction of fish habitat is regulated under the federal *Fisheries Act* (or at least intended to be so), other species' habitat is not offered similar protection. Likewise, the Ontario *Endangered Species Act* offers no protection to endangered or threatened ecosystems. It applies only to species at the brink of extinction and their habitat - and not those identified as nationally threatened or vulnerable. As well, little attention is paid to invertebrate species.

The widespread use of discretionary language in provincial legislation affecting biodiversity is also a significant problem - and even where mandatory "shall" language is used, the MNR may still try to interpret it as non-mandatory.<sup>81</sup> Because of this discretionary approach, provincial land use policies meant to protect a broad range of environmental values (wetlands, woodlands, endangered species habitat) will not necessarily be followed in all areas. Similarly, crucial determinations such as the issuance of forestry licenses and plans are left to the near total discretion of the MNR. A similar approach to legislative drafting, which leaves crucial determinations in the hands of Ministers or their delegates, was employed in the new *Fish and Wildlife Conservation Act*.

The lack of clear and accessible environmental protection standards in the forestry regulation regime is another significant problem. A myriad of guidelines, codes, manuals, etc. set out the standards applicable to forestry operations. Many of the most important biodiversity values are only protected by non-binding guidelines rather than regulations.

While gaps in protection are a significant problem, there are a number of existing policies and laws that result in the discouragement of biodiversity protection. The *Drainage Act*, for example, works against wetland protection.<sup>82</sup> In the same way, weed control legislation and by-laws can impede restoration efforts by encouraging the eradication of native species (e.g., milkweed) even though they are relied on by many others (e.g., the monarch butterfly - a species designated as vulnerable). Similarly, the free-entry mining system often permits prospectors to acquire development rights in areas prior to any determination of the ecological significance of the area.

**Lack of enforcement:** Reflecting the government's overall lack of concern for environmental protection, budgets and staffs in the environmental regulation field are decreasing. For example, Ministry of the Environment (MOE) prosecutions of environmental offences are on the decline as evidenced by a nearly 70% drop in fines from 1995 to 1997,<sup>88</sup> and biodiversity laws generally have never been adequately enforced. For example, the Ontario *Endangered Species Act* has been in place for over 25 years, but, despite a growing list of species at risk, it has yielded very few enforcement actions.<sup>89</sup> Cutbacks and policy decisions have also resulted in the government failing to abide by environmental standards, with the MNR having been recently found in extreme non-compliance with the *Environmental Assessment Act* and the *Crown Forest Sustainability Act* by the courts, and convicted and fined under the *Environmental Assessment Act* in a separate incident.<sup>90</sup> The latter case also evidenced the need to update environmental legislation to allow larger fines and other deterrent options.<sup>91</sup>

The MNR's recent decision to withdraw from the administration and enforcement of the *Fisheries Act* (federal legislation typically administered by the provincial governments), without any arrangement with the federal government to properly take over such responsibility, was subject to criticism from the Environmental Commissioner.<sup>92</sup>

A recent field audit of compliance with forestry standards in the Algoma Highlands north of Sault Ste. Marie found widespread violations.<sup>93</sup> The investigation and enforcement capacities (in staffing and budget terms) of the MNR and MOE do not even approach the level necessary to bring about compliance in the field. Since nearly all activities regulated by the MOE and MNR directly or indirectly affect biodiversity, lax enforcement poses a substantial threat to biodiversity in the province. Whether it is hunting, forestry, shoreline development, pollution, etc., any failures to properly enforce legal standards will have a detrimental impact.

#### Wetlands

Wetlands are highly diverse habitats where land and water meet and plants and invertebrates flourish. They are the required breeding and feeding ground for thousands of species. Almost one quarter of the world's wetlands, including salt marsh estuaries, inland marshes, fens, bogs and swamps, occur in Canada.<sup>83</sup> Conversion of wetlands for agriculture and urbanization has resulted in dramatic losses of these habitats. In southern Ontario, less than 30% of the original wetlands remain.<sup>84</sup> Along the Canadian shores of lakes St. Clair, Erie and Ontario, 35% of the wetlands have been destroyed, with an estimated 83% of the marshland lying between the Niagara River and Oshawa gone or degraded.<sup>85</sup> Firm policies to protect wetlands are lacking and the losses continue. This is especially true for "smaller, isolated and headwater wetlands that not only provide important breeding and feeding sites for many non-game species but provide valuable ecological services of water filtration and stormwater retention across the (Great Lakes) Basin."<sup>86</sup>

Recent changes to the *Planning Act* have weakened protection measures even further by applying development controls only to wetlands south and east of the Shield and by removing an explicit requirement for impact studies on developments proposed in or adjacent to wetlands.<sup>87</sup>

**Deregulation:** Notwithstanding the fact that current laws are inadequate, even existing protection measures are being eliminated or weakened through legislative changes. Discretionary and voluntary initiatives are replacing mandatory obligations. As noted above, changes to the *Planning Act* lessened protection of many environmental values. Mandatory government inspections under the *Aggregate Resources Act* and mandatory pre-development financial assurances under the *Mining Act* have also been eliminated. Permit requirements for pesticide uses, a variety of activities on public lands, and certain aggregate operations on the Niagara Escarpment have also been done away with. In many areas, for example, compliance monitoring for environmental protection is being shifted to the regulated industry itself as part of self-monitoring and voluntary initiative processes, despite evidence that government regulation is key to bringing about compliance.<sup>95</sup>

The MNR came under recent criticism for failing to fulfill a requirement imposed by the Environmental Assessment Board for protecting the physical environment from the negative impacts of forestry operations. The Environmental Commissioner noted:

Although these new [MNR] guidelines could help to protect the physical environment of the forest, the forest industry is required only to consider them - not apply them - even though the Environmental Assessment Board had ruled that use of the guidelines was to be mandatory.<sup>96</sup>

### **Policy and Programme Limitations**

**Offloading of provincial responsibilities:** In its efforts to balance the provincial budget, the government of Ontario has been transferring responsibilities for environmental protection to municipalities and industry. This transfer is taking place without any assurance that the newly responsible parties will be able or willing to take the steps necessary to protect biodiversity. As the province withdraws from environmental decision-making, approaches to protection are becoming increasingly fragmented and

#### **The Niagara Escarpment**

As southern Ontario's most prominent landscape feature, the Niagara Escarpment has been a focus of biodiversity protection efforts and has been designated a United Nations World Biosphere Reserve. The Escarpment provides a rich diversity of habitats and microclimates that support plant and animal life not common elsewhere in Ontario, e.g., hart's tongue fern and eastern white cedars up to 1,650 years old (the oldest old growth in eastern North America). It is a favoured destination for recreation, pumping up to \$100 million into local Escarpment economies each year. The Niagara Escarpment Plan (NEP) was the first and largest-scale land use plan in Canada in which environmental protection is given the highest priority. It represents an attempt to integrate development and protection.

Recent policy changes affecting the Niagara Escarpment are a microcosm of the government's lack of environmental vision. In recent years, the Niagara Escarpment Commission (which administers the NEP) has sustained a 37% budget cut accompanied by massive budget cuts to the 7 conservation authorities in the NEP area.<sup>94</sup> As well, administration of the *Niagara Escarpment Planning and Development Act* has been transferred from the MOE to the MNR (the same agency that promotes aggregates extraction, one of the greatest threats to the Escarpment).

uncoordinated. With the removal of the provincial representatives from Conservation Authorities, for example, the provincial perspective and input into watershed management is lost. As well, the decision to consolidate planning matters with the Ministry of Municipal Affairs and Housing will reduce the MNR's role in ensuring wetland protection and inhibit progress towards more ecologically-based land use planning.<sup>97</sup>

The Environmental Commissioner outlined concerns about off-loading in her *1997 Annual Report*:

Many of our findings highlight the difficulties people have in getting a problem resolved when several ministries as well as municipal organizations are involved, or when the province passes down to a municipal level of government new responsibilities and service obligations. Often, there is no evidence the municipal level of government has the capacity to solve the problem. For example, local authorities facing watershed management issues often rely on leadership and advice from the province. These are the kinds of problems that need to be dealt with on an ecosystem basis and not on the basis of political boundaries, and their solution needs provincial leadership to be viable.<sup>98</sup>

Off-loading of responsibilities for environmental protection to industries is one way that government ministries are attempting to cope with budget and staff cuts. The MNR announced in April 1996, for example, that the forestry industry would have to take on more responsibility for some aspects of monitoring and compliance with forestry rules. The Environmental Commissioner has criticized the Ministry for the fact that the policies, procedures and guidelines for the forestry industry have been developed and approved without public consultation.<sup>99</sup>

The forestry industry's intention to comply with regulations is cast in doubt, furthermore, by a recent study of forestry operations conducted in the Algoma Highlands. This study found violations of guidelines and regulations at over half of the sites investigated.<sup>100</sup>

**Funding cutbacks to conservation programmes:** In recent years there have been drastic funding cutbacks to conservation programs and agencies. With the passing of the Omnibus Bill (*Savings and Restructuring Act*, 1995), for example, the provincial funding of Conservation Authorities was reduced by 70%, severely limiting the ability of these agencies to undertake such activities as erosion control and watershed management. Similarly, a recent Ontario government report declared that as of 1997, provincial funding would no longer be available for watershed or subwatershed planning projects.<sup>101</sup> Notably absent from the decision-making processes leading up to these cutbacks has been any concerted effort to determine the long-term savings that regulation and protection initiatives bring about by preventing problems from occurring in the first place.

As the Carolinian Canada Steering Committee points out in its *1997 Summary Report*, without adequate funding from provincial and federal governments, financial

responsibility falls unfairly on the shoulders of others, and conservation measures are consequently limited:

The benefits of conservation are spread far too wide to be captured by local sources alone. In particular, the two senior levels of government have legislated responsibilities and international commitments to conserving biodiversity. They should be expected to be significant funders of conservation activity, both for their own functions and in partnership with others.<sup>102</sup>

**Inadequate protected areas system and roadless wilderness policy:** While the provincial government has committed itself to satisfying the Endangered Spaces campaign (a proposal to complete a system of protected areas to represent each natural region) by the year 2000, progress has been slow. At present, of Ontario's 65 terrestrial natural regions, only 5 are considered adequately represented in the protected areas system, 11 moderately represented, 26 partially represented, and 23 have little or no representation. As for marine regions, there is still only one marine protected area in the province. The three most recent annual World Wildlife Fund Canada (WWF) report cards on protected areas gave Ontario "F", "C-" and "D+" grades for terrestrial protected areas and three "D" grades for marine.<sup>108</sup>

The MNR approach to interpreting the Endangered Spaces campaign is significantly flawed. As revealed by the provincial government's recent Lands for Life land use planning process, the MNR may seek to satisfy the campaign's primary goal (representation of all the province's natural regions) through minimal representative samples that will be unable to provide adequate habitat for wide-ranging species or allow for natural disturbances such as wildfire. According to this minimalist approach, the MNR justified recent plans (later declared illegal in court) to cut old-growth pine forests in Temagami (already reduced to less than one per cent of their original extent) on the basis that the area to be cut was not significantly different from previously protected areas. The approach completely ignored crucial factors such as natural disturbance regimes, ecosystem rarity, predator-prey systems, and successional stages, which would have demonstrated the need to protect additional old-growth forest areas to achieve adequate ecological representation in Temagami.<sup>109</sup> Should this minimalist approach remain MNR policy, significant tracts of valuable habitats will be

#### Old Growth Forests

Old growth forests offer critical habitat for plants and animals that young forests are unable to provide. Characterized by complex canopy structure and varying microclimates, old growth forests are the preferred habitat of many species.<sup>103</sup> Because they contain, for example, old, dead, dying and downed trees, they provide habitat for numerous hole-nesting and insectivorous species such as red-headed and pileated woodpeckers and northern flying squirrel.<sup>104</sup>

Sadly, less than 2% of the Great Lakes basin's old growth forests remain. Their absence adjacent to lakes impedes the reoccupation of shoreline areas by top aquatic predators such as bald eagle and osprey.<sup>105</sup> Similarly the loss of mature conifer forests in northern Ontario threatens the preferred habitat of such species as boreal owls, broad-winged hawks and American martens.<sup>106</sup> Despite the losses, the MNR aims to protect only one small example of old growth forest in each site district.<sup>107</sup>



assigned to industrial development rather than protected areas, thereby diminishing biodiversity protection prospects in the province.

In keeping with its attempts to maximize the amount of land available for development, the MNR has failed to comply with the intent of the Environmental Assessment Board's requirement to create a Roadless Wilderness Policy for use on forest management lands. Logging roads have a number of devastating impacts on biodiversity including direct impacts on fish habitat, water quality, and fish migration, and indirect impacts such as habitat fragmentation and increased access by recreationalists, mining prospectors, hunters and anglers (often leading to overuse and introduction of invasive species). The MNR's failure to establish roadless wilderness areas within the managed forest land base will cause further reductions in biodiversity.

**Privatization and sale of public resources:** Despite the fact that public lands are owned by all Ontarians, province-wide consultation does not have to be (and typically is not) carried out on their sale. In recent years, the MNR has looked to sell public lands as a source of revenue and has proposed legislative changes to further encourage this approach to revenue generation.<sup>113</sup>

The MNR is also planning to dispose of other Crown resources such as forests through long-term tenure agreements with the forestry industry. Because the forestry industry's primary purpose is to generate revenue from the cutting of forests, increased industry control of our forests will likely lead to increased forest habitat loss and subsequent threats to biodiversity.

### **Ministerial Jurisdiction**

**MNR's dual mandate:** In designing a governmental system to protect environmental values such as biodiversity, it is essential that the regulating agency have a clear environmental protection mandate. The MOE has little direct jurisdiction over

#### **Carolinian Canada**

The Carolinian life zone, lying south of a line stretching roughly from Grand Bend to Toronto, is Canada's most diverse terrestrial region in species richness. It is:

- home to more endangered and rare species than any other life zone in Canada,
- the only home for over a third of Ontario's imperiled plants,
- home for 52% of the vertebrate animal species most at risk in Ontario, and
- home to 65% of Canada's species at risk.<sup>110</sup>

Carolinian Canada is also the most urbanized and intensively farmed landscape in the country, with the result that loss and fragmentation of original wetland, savannah and forest habitats have been and continue to be severe. In addition, the human population in this region has increased 37% in the past 25 years; this trend is expected to continue.<sup>111</sup> Given these pressures and the area's incredible biological richness, there is an urgent need to put adequate conservation measures into place.

Despite the wide range of conservation programmes in place in Carolinian Canada, funding cuts have seriously reduced their effectiveness. For example, important programmes related to forest management and water quality restoration have been canceled. Loss of biodiversity continues, with over a third of the region's natural communities classified as imperiled or vulnerable to extinction in Ontario.<sup>112</sup>

biodiversity issues and concerns itself mainly with pollution regulation. Unfortunately, nearly all important biodiversity values (e.g., fish, wildlife, parks, Niagara Escarpment, public lands) are regulated by the MNR, an agency which is more in the business of promoting resource extraction (e.g., forestry, aggregates) than it is in promoting environmental protection. Because of this dual mandate, conflicts arise between the MNR's historical and still central role in developing the province's natural resources and the MNR's more recent attempts to protect them. Especially in times where short-term economic policies trump ecological priorities (as is the case with the present government), the MNR's role in protecting biodiversity becomes quite minimal. Efforts concentrate on satisfying the needs of the MNR's perceived primary clients (i.e., industry) rather than its actual clients (i.e., the people of Ontario). Without a separate agency advocating for biodiversity protection, such concerns fall by the wayside.

By way of example, the MNR put proposed guidelines for forestry management (protecting the physical environment from rutting, soil erosion, nutrient loss and impacts on surface and groundwater) on the *EBR* Environmental Registry in 1997, stating that significant changes to standard operating practices may be required to protect sensitive sites. And yet, when a forestry company challenged the ministry's estimates of the potential risk of these impacts and objected to many of the recommended practices, the ministry removed many of the recommended restrictions on forestry operations.<sup>114</sup>

## **ENVIRONMENTAL MOVEMENT'S VISION FOR THE FUTURE**

### **General Vision:**

The entire array of biodiversity values is maintained across the province and where possible restored, and henceforth is permitted to evolve naturally into the future.

### **Specific Components:**

- Ecological processes and evolutionary changes are permitted to carry on without human interference.
- The populations and ranges of all current species at risk (vulnerable, threatened, endangered or extirpated) are recovered to self-sustaining levels.
- No further species are threatened, endangered or extinguished as a result of human activity.
- A permanent system of protected areas free from industrial use is established which represents all natural regions and features of the province, permits natural disturbances to continue, and harbours adequate habitat for all native species.
- Significantly degraded habitats and natural communities greatly reduced in extent are restored to healthy levels.
- Unique, rare and significant features are given recognition and permanent protection.
- The introduction of further non-native species is halted, and those that are already present and adversely affecting native species are brought under control.
- The stewardship of private lands fosters the protection of biodiversity.

- The management of public lands open for industrial use sustains biodiversity at the local, regional and provincial levels.
- Laws protecting biodiversity are enforced and applied equally to all, and used to support conservation action.
- Adequate government resources and incentives are put towards sustaining biodiversity.
- The public possesses a broad awareness of the importance of ecosystems, natural communities and biodiversity in general and that awareness is reinforced through the education system.
- Broad community action to support conservation exists.
- The release of contaminants that harm biodiversity is virtually eliminated.
- Ecological sustainability is, in policy and practice, the overriding priority of all levels of government and the public.

## APPROACHES AND RECOMMENDATIONS

This section briefly sets out promising biodiversity protection initiatives followed by recommendations for further action. While the federal government, industry, municipalities, non-governmental organizations (NGOs) and citizens all have roles to play in biodiversity protection, our task here is to outline steps that need to be taken by the provincial government. The recommendations are organized as follows: protecting key elements of biodiversity, addressing threats, sustainable use, legislation, improved understanding, and organizational reform

### Protecting Key Elements of Biodiversity

#### Completion of the Protected Areas System

As recognized in the *Biodiversity Convention*, habitat protection is the first step to be taken in maintaining biodiversity.<sup>119</sup> Protection is, in fact, the primary objective of the Provincial Parks system in Ontario. Fortunately, all of our conservation reserves and provincial parks (except Algonquin) prohibit industrial development, unlike a number of other jurisdictions in Canada. As well, with the recent creation of a coordinated parks agency, Ontario Parks, there has been a renewed commitment to developing management plans for each park.

#### Economic Implications

The costs and benefits of biodiversity conservation recently have been the subject of much attention and research. The regularly published federal study on *The Importance of Wildlife to Canadians*<sup>115</sup> helps quantify some aspects of the significant positive socioeconomic impacts stemming from biodiversity. It shows a steady rise in total expenditures by Ontario participants in wildlife-related activities in recent years.<sup>116</sup> The MNR estimates that recreational fishing, hunting and wildlife viewing contribute more than \$5 billion annually to the Ontario economy and provide approximately 100,000 jobs.<sup>117</sup> Other obvious major benefits include direct commercial harvesting of wild species (e.g., forestry, fisheries), air and water purification, medicines and agricultural crop development.<sup>118</sup> While it is clear that implementing the recommendations contained herein will involve substantial government expenditures, they are greatly outweighed by the long-term economic, social and environmental costs of failing to act to sustain the biodiversity of Ontario.

In the opinion of all the leading conservation organizations in the province, however, the protected areas system is far from completed. To this end, the Endangered Spaces campaign, led in Ontario by WWF and the Wildlands League (WL), sets out a science-based approach for developing a system of protected areas that represents each of the province's natural regions. WWF, WL and the Federation of Ontario Naturalists (FON) have mapped out the necessary system for a large portion of northern Ontario. Such a system would have the advantage of protecting large numbers of species, including species at risk.

While the Ontario government has officially endorsed the Endangered Spaces campaign and committed to implement it, its interpretation of the campaign's requirements so far involves only a system of minimal protected areas that are too small to protect wide-ranging species and that permit natural disturbance patterns to continue.

An additional concern in the creation of protected areas is that the interests of aboriginal people be considered. Treaty and aboriginal rights must be respected. Where proposed protected areas may impinge upon aboriginal interests, those groups affected should be involved in the planning and management from the outset.<sup>120</sup>

#### **Recommendations:**

The Government of Ontario should:

- permanently protect the proposed protected areas system for the Lands for Life planning region identified by WWF, WL, and FON from industrial development through provincial parks and conservation reserves designations;
- identify and protect a similar system for the remainder of the province;
- for the already degraded southern Ontario landscape, protect existing remnants of natural habitat and create a new restoration class of reserves to recreate adequate habitat to complete the system of protected areas;
- ensure that the creation of new protected areas respects all treaty and aboriginal rights;
- implement the provincial protected areas system in a manner that: preserves or recreates connections amongst protected areas, provides buffer zones around protected areas, permits natural disturbances to continue and wide-ranging species to thrive, and is in keeping with the precautionary principle which favours conservation where knowledge is incomplete;
- amend the *Provincial Parks Act* to: require the maintenance of ecological integrity as the overriding objective, prohibit industrial development in all parks and conservation reserves, make the preparation of park management plans mandatory, provide for a system of ecological reserves protecting unique and sensitive sites from disturbance, and provide for a system of restoration reserves in areas of high degradation;
- develop a policy and system of substantial roadless wilderness areas in the industrial use zones to increase the protection of biodiversity outside protected areas; and
- consolidate management of parks, conservation reserves and roadless areas under one parks agency and legislative scheme.

### **Protection of Ecological Processes**

The protection of individual species and habitats will not preserve biodiversity unless the ecological processes upon which all species depend are also protected. While the adoption of the present recommendations will foster the protection of ecological processes, specific emphasis must be placed on maintaining such processes as pollination, nutrient cycling, nitrogen fixation, and mycorrhizal associations.<sup>121</sup> Many government activities, such as the MNR's and Ministry of Agriculture's promotion of the use of pesticides, which detrimentally affect ecological processes, have not been properly assessed and regulated.

### **Recommendations:**

The Government of Ontario should:

- conduct an independent audit of all government legislation, policies and activities affecting biodiversity to determine how they can be modified to better foster the protection of biodiversity and ecological processes, and then implement the recommendations of the audit.

### **Programmes to Protect Wildlife Including Species at Risk**

The MNR and NGOs participate in the two government-led national programmes for species at risk: the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which lists species at risk, and the Recovery of Nationally Endangered Wildlife (RENEW), which develops recovery plans for some species at risk. In Ontario, there is also an additional listing body, the Committee on the Status of Species at Risk in Ontario (COSSARO). In addition to government programmes, WWF's Endangered Species Recovery Fund funds scientific research and action necessary for the recovery of Canada's species at risk; this is an essential step in preparing and implementing recovery plans. WWF's toxicology programme advocates a reduction in use of pesticides including those that harm species at risk.<sup>122</sup> The Canadian Nature Federation (CNF) is attempting to address the shortage of data on less well-known species at risk such as invertebrates. Ontario has an outdated and rarely enforced *Endangered Species Act (ESA)* and has endorsed the *National Accord for the Protection of Species at Risk*, but has done little to implement it. Additionally, the significant deficiencies of the province's general wildlife management policies have been uncovered recently by the Provincial Auditor. However, the MNR's recent decision to terminate the spring bear hunt may be a sign that more efforts will be made to reform wildlife management policies.

### **Recommendations:**

The Government of Ontario should:

- amend the *Endangered Species Act* to: include all extirpated, endangered, threatened and vulnerable species and their habitat, require mandatory recovery plans for all listed species, remove the "wilful" requirement from the prohibition section, require the mandatory adoption of a list of species at risk regularly updated by a scientific committee, and incorporate all of the commitments made in the National Accord;

- develop and fund the programmes necessary to ensure that wildlife legislation is enforced and that all identified species at risk are recovered;
- require land use planning decisions to be consistent with the Natural Heritage section of the *Provincial Policy Statement* (which includes protection for the habitats of species at risk) under the *Planning Act*;
- improve wildlife management by updating baseline information and monitoring with a view toward maintaining healthy, self-sustaining populations and preventing any further species from becoming at risk; and
- implement a research and incentive programme to reduce the fatal collision of migrating birds with human-built structures

## **Addressing Threats**

### **Control of Non-native Species**

In order to promote public awareness of the impacts of non-native species on biodiversity, NGOs have published and distributed educational materials and are actively lobbying governments to fund research programs on the control of non-native species in the Great Lakes basin. Despite government and non-government efforts, non-native species introductions continue and their effects worsen.

### **Recommendations:**

The Government of Ontario should:

- prohibit the intentional introduction of non-native species (including organisms modified by genetic engineering) without environmental assessment studies on potential impacts,<sup>123</sup> and develop guidelines for control grounded in the precautionary principle prior to licensing the introduction;
- develop educational materials to teach about the consequences of introducing non-native species;<sup>124</sup>
- support research into the extent of introductions and the ecological damage being caused to native biodiversity by non-native species;<sup>125</sup> and
- adequately fund research programmes to develop strategies to understand, deal with and where possible reduce the ecological impacts of non-native aquatic species such as zebra mussels and sea lamprey in the Great Lakes.<sup>126</sup>

### **Reduction and Elimination of Toxic Substances**

Numerous NGOs have been involved in efforts to promote awareness of the impacts of toxic substances on biodiversity and have urged governments to put into place legislation and incentives to reduce and eliminate the use and production of such substances. They have played a critical role in pulling together scientific information demonstrating the impacts of contaminants on humans and wildlife. Through public awareness campaigns, they have provided target groups such as farmers with information on the impacts of pesticides and have also sought to educate the general public about the dangers of common household cleaners. NGOs are supporting organic farming and ecoforestry initiatives as pesticide-free alternatives to industrial agriculture and forestry. Government

efforts on specific substances of concern such as DDT have been effective, but progress on many fronts has been slow. Ontario's industries constitute one of the largest pollution sources on the continent.

**Recommendations:**

The Government of Ontario should:

- support efforts to reduce and eliminate the introduction of toxic contaminants into the environment through funding, public education and policy and legislative reform;
- set an unequivocal goal of zero discharge for all persistent toxic substances; and
- support initiatives and pilot projects in organic and sustainable farming and ecoforestry through funding and policy reform.

**Sustainable Use**

**Improved Resource Use Practices**

While a properly planned protected areas system will be able to protect many biodiversity values, resource use activities outside the system must also be managed to sustain biodiversity. Where resource use is ongoing, better practices can be implemented to help mitigate the adverse effects associated with such use. A recent unsuccessful attempt by the MNR to convince a court that its old timber management approach to forestry was sufficient to satisfy new obligations under the *Crown Forest Sustainability Act* helps demonstrate the provincial government's reluctance to embrace sustainable use in practice.<sup>127</sup>

**Recommendations:**

The Government of Ontario should:

- reinstate the requirement for financial assurances to be put in place before mining activities are approved;
- reinstate mandatory government inspections of aggregate operations;
- replace the free-entry mining system with a regime that places the protection of biodiversity as the top priority;
- replace the wide array of non-binding guidelines for forestry with mandatory requirements to protect biodiversity values;
- replace the minimal 3 metre streamside buffer requirement for forestry operations with a minimum 30 metre no-harvesting zone around all watercourses<sup>128</sup> (while allowing for a greater buffer zone for more significant features); and
- where industry receives benefits from the utilization of public lands, require it to pay for the programmes necessary to protect biodiversity on such lands (the user pays principle).

### **Private Land Stewardship and Acquisition**

Because much of Ontario's threatened biodiversity coincides with the largely privately held southern Ontario landscape; private land stewardship to protect biodiversity is essential. Carolinian Canada and other organizations work with private landowners to try to improve biodiversity protection with the use of such tools as conservation agreements, easements and covenants. The provincial government has put in place a number of measures to improve biodiversity protection on private lands (e.g. easements, provision of plants and information, reductions of taxes for some woodlands, conservation lands, Niagara Escarpment Natural Areas, and endangered species habitats).

A number of NGOs protect biodiversity and habitat by direct acquisition of land. The provincial government currently provides some funding and tax incentives for the acquisition of significant areas. Unfortunately, some lands acquired for conservation purposes are now being logged for profit by government agencies such as local Conservation Authorities.

#### **Recommendations:**

The Government of Ontario should:

- support the acquisition of conservation lands by local land trusts and other bodies through substantial grants and other incentives;
- broaden the scope of lands eligible for favourable tax treatment to all lands expressly dedicated to long-term conservation;
- publicize private land stewardship options and encourage landowners to utilize conservation incentives by providing information and advice;
- prohibit commercial logging and other harmful development on conservation lands acquired with the assistance of charitable organizations; and
- develop, fund and implement a major land acquisition programme in southern Ontario to help complete the protected areas system.

### **Ecological Restoration**

Protecting in the sense of preserving landscapes is not an option in those parts of Ontario where natural systems have been destroyed or degraded over large regions by agriculture, urbanization and industrial activities. In these areas, one promising approach to biodiversity conservation, supported in large part by NGOs such as the Evergreen Foundation, is ecological restoration. Restoration projects aim to repair "damage caused by humans to the diversity and dynamics of indigenous ecosystems"<sup>129</sup> through the reintroduction of native species and the re-creation of native habitats, ideally taking into account both genetic and broader landscape diversity.<sup>130</sup> In some cases, these efforts represent a means of linking and expanding upon isolated fragments of natural areas. Since restoration projects often involve volunteers, children and local residents, they also provide an opportunity to educate the public about native species, ecological relationships and biodiversity through hands-on experience.

#### **Recommendations:**



The Government of Ontario should:

- support ecological restoration projects through partnerships, funding, recovery programmes and the provision of expertise;
- undertake restoration projects in Provincial Parks, especially those in southern Ontario that have suffered biodiversity loss through over-development, over-use, and the introduction of non-native species;
- initiate policy and legislative reform to require those who engage in industrial activities on public lands and waters to actively restore biodiversity and ecosystem function to those sites upon completion of their projects; and
- Revise the *Weed Control Act* and its regulations so that they do not impede conservation and restoration efforts.<sup>131</sup>

## **Legislation**

### **Legislative Reform**

The provincial and federal governments have passed a wide range of laws to help promote the protection of biodiversity, but there are serious shortcomings. For example, most species are offered little to no habitat protection in legislation even though it is recognized that habitat loss is the most important cause of decline. As well, Ontario's recent policy commitments, such as the *National Accord for the Protection of Species at Risk*, have not been implemented through the required legislative improvements. In all, significant legislative efforts are required to fill in gaps in protection and to better protect biodiversity through the use of clear mandatory duties and prohibitions.

### **Recommendations:**

In addition to implementing the specific legislative reforms recommended in other sections, the Government of Ontario should make the following general legislative changes:

- amend current legislation and regulations affecting biodiversity to replace discretionary powers to protect biodiversity with mandatory duties where possible;
- add the protection of biodiversity and ecological processes as a fundamental purpose of legislation affecting biodiversity;
- pass legislation to better protect the many species afforded little or no habitat protection (e.g., birds); and
- widen the scope of the *Environmental Assessment Act* to include all proposals and permitting processes that may significantly adversely affect biodiversity values, and phase out the use of exemptions.

### **Enforcement and Implementation of Laws, Regulations and Policies**

Progressive biodiversity protection laws and policies are only useful if enforced and implemented. Too often, important improvements on paper do not have their intended effect on the ground because of a lack of resources and political will. The government has the central role and responsibility to undertake enforcement and carry out implementation. Declining enforcement on the part of the MOE and the MNR is reducing

the effectiveness of existing legislative standards protecting biodiversity and the environment in general.

**Recommendations:**

The Government of Ontario should:

- allocate adequate government resources to fully enforce laws that directly concern biodiversity (e.g., *Fish and Wildlife Conservation Act*, *Endangered Species Act*, *Provincial Parks Act*, as well as those federal laws in which the provincial government has an enforcement role to play: *Fisheries Act*, *Migratory Birds Convention Act*) and general environmental protection laws whose proper enforcement will also benefit biodiversity (e.g., *Environmental Protection Act*, *Ontario Water Resources Act*, *Environmental Assessment Act*);
- develop an effective inspection, reporting and audit system that will accurately assess the degree of compliance with all laws, regulations and policies intended to protect the environment;
- allocate adequate government resources to fully implement policies to protect biodiversity (e.g. *Biodiversity Strategy*, Nature's Best Program, Natural Heritage portion of the *Provincial Policy Statement*);
- reduce barriers to citizen enforcement actions by amending the *EBR* to: remove requirement for citizens to show unreasonable government action before proceeding with enforcement actions to protect the environment, and restrict awards of costs against citizens to clearly frivolous cases; and
- require the MOE and MNR to issue timely annual compliance and enforcement reports to the Ontario legislature that provide detailed and complete data on who is in non-compliance, who was prosecuted or levied with administrative penalties, and who was convicted.

**Improved Understanding**

**Research and Monitoring**

While monitoring does not protect or restore biodiversity *per se*, it is vital to making informed decisions regarding the environmental consequences of activities and decisions. Biodiversity declines can result from decisions made in the absence of proper baseline monitoring data. NGOs, as well as most Ontario universities and thousands of volunteer naturalists and landowners contribute to the research and monitoring agenda but significant government resources are required to implement a comprehensive biodiversity research and monitoring programme. The creation of the public/private partnership Natural Heritage Information Centre is a positive step towards improving access to research information.

**Recommendations:**

The Government of Ontario should:

- develop and implement a biological survey equivalent to the Ontario Geological Survey, including as potential partners: Natural Heritage Information Centre,

universities, colleges, museums, Ontario Parks, ministry research branches, environmental groups;<sup>132</sup>

- establish and run a voluntary land registry that includes both regulated protected areas and comparably protected natural areas (e.g., fish and wildlife management areas, Conservation Authority lands, Biosphere Reserves, private nature reserves, First Nation protected areas);<sup>133</sup>
- substantially increase funding available for biodiversity research and training;
- initiate a programme to properly inventory and study less well-known species such as plants and invertebrates; and
- complete the inventory of significant natural features meant to be protected under the Natural Heritage section of the *Provincial Policy Statement*.

### **Education**

Biodiversity and conservation efforts will be of little long-term value without public, community and school-based education efforts that promote awareness of existing problems and foster an ethic of conservation. Current approaches of ENGOs include the publication of field guides, magazine articles and reports, programmes for school groups, and interactive exhibits at museums and interpretive centres. Hands-on, participatory approaches to education through involvement in specific projects (e.g., biological surveys, research, habitat restoration, stream clean-ups) are supported, organized and carried out by many ENGOs and have proven particularly effective.

In addition to these efforts, biodiversity and conservation issues should be emphasized in the public school system. Unfortunately, recent funding cutbacks to education are hampering the ability of many Boards of Education to maintain outdoor education centres where the bulk of environmental education often occurs.

At the post-secondary level, there is a need for an increased emphasis on natural history and conservation education.<sup>134</sup> Trained researchers are required to carry out recovery projects. Land, wildlife and water resource managers currently in the field also need to receive training in the science of conservation biology.<sup>135</sup>

### **Recommendations:**

The Government of Ontario should:

- support the biodiversity and conservation education programmes of ENGOs through partnerships and funding and by reaching out to educators through workshops and educational materials;
- provide adequate financial support to maintain and enhance environmental education programmes at all levels;
- integrate environmental education programmes across the curriculum;<sup>136</sup> and
- ensure that government employees whose work relates to resource management or impinges upon the conservation of biodiversity receive training in conservation biology.

## **Organizational Reform**

### **Holistic, Consistent Planning Frameworks**

While NGOs recognize the importance of involving local citizens and agencies in conservation initiatives, they also underline the need to maintain a broader provincial perspective in land use planning and to integrate approaches to conservation across the landscape.<sup>137</sup> Recognizing that the division of land and waters along municipal and property boundaries does not respect naturally defined boundaries, they advocate watershed, landscape or ecosystem approaches to planning.

The recent withdrawal of government support from watershed planning initiatives and from such agencies as the Niagara Escarpment Commission and Conservation Authorities is a step in the wrong direction and needs to be corrected.

### **Recommendations:**

The Government of Ontario should:

- encourage the development of watershed management plans at the local level, and provide both technical and financial resources and assistance to municipalities and Conservation Authorities in developing and implementing such plans;<sup>138</sup>
- renew its commitment to Niagara Escarpment protection through: improved funding for a Niagara Escarpment Commission (NEC) that retains full administration of the Niagara Escarpment Plan (NEP), and assurance that all future appointments to the NEC are committed to support the NEP;<sup>139</sup>
- appoint provincial representatives dedicated to biodiversity conservation to all Conservation Authorities; and
- restore biodiversity protection measures under the *Planning Act* and the Natural Heritage section of the *Provincial Policy Statement*.

### **Public Participation**

NGOs have long recognized the need to ensure public awareness of and participation in matters relating to conservation. Approaches have included education programmes, publications, citizens' guides, letter-writing campaigns, workshops, and public meetings. Involvement in government processes around land use planning, forestry management and park management has also been encouraged. Groups like the FON actively support Environmental Advisory Committees whose role is to provide local municipal councils with advice and expertise regarding the environmental aspects of land use planning.

Given the recent downloading of responsibilities for environmental protection to municipalities, the Ontario government has a duty to ensure that citizens and agencies at the local level have the means and expertise to assume these responsibilities and to ensure the protection of biodiversity.

### **Recommendations:**

The Government of Ontario should:

- ensure there is improved public participation in land use decision-making through public consultations involving: Ontarians from all parts of the province; First Nations; public scrutiny of the best available information; and adequate public comment periods on the Environmental Registry;<sup>140</sup> and
- provide information and expertise regarding biodiversity conservation to citizens and agencies involved in land use planning and management.

### **Government Reorganization**

Because the MNR's dual mandate of resource extraction and resource conservation has not permitted it to adequately protect biodiversity, a governmental reorganization would facilitate greater biodiversity protection.

### **Recommendation:**

The Government of Ontario should:

- transfer responsibilities for biodiversity protection including administration of parks, public lands, conservation authorities, Niagara Escarpment, fish, wildlife and endangered species from the MNR to a new ministry, which may be combined with the existing Ministry of the Environment.

### **Addressing Global Concerns**

Under international agreements and as a wealthy people enjoying the benefits of an advanced industrial society, Ontarians have a global responsibility to conserve biodiversity.

### **Recommendations:**

The Government of Ontario should:

- participate in regional, national and where appropriate international cooperative efforts to conserve biodiversity; and
- identify linkages to global issues and address them domestically.

## ENDNOTES

<sup>1</sup> J.L. Riley and P. Mohr, *The Natural Heritage of Southern Ontario's Settled Landscapes: A Review of Conservation and Restoration Ecology for Land-use and Landscape Planning* (Aurora, Ontario: Ontario Ministry of Natural Resources (MNR), 1994), p. 10, from E.O. Wilson, "The Biological Diversity Crisis," *Bioscience*, 35 (1985), pp. 700-706. Estimates of the rate of extinction vary widely. For example, the *Canadian Biodiversity Strategy* provides a range of between 1,000 to 10,000 times the natural rate (Environment Canada, *Canadian Biodiversity Strategy: Canada's Response to the Convention on Biological Diversity* (Hull: Environment Canada, 1995), p. 12.).

<sup>2</sup> World Wildlife Fund Canada (WWF), *Innocent Bystanders: The Impact of Pesticides on Canadian Biodiversity* (Toronto: WWF, 1994), p. 4.

<sup>3</sup> WWF, *Their Future is Our Future: World Wildlife Fund Canada 1997 Annual Review* (Toronto: WWF, 1997), p. 2.

<sup>4</sup> W. Wake, ed., *A Nature Guide to Ontario* (Toronto: University of Toronto Press, 1997), p. 23.

<sup>5</sup> Wake, p. 21.

<sup>6</sup> Riley and Mohr, p. 9.

<sup>7</sup> For example, tallgrass prairie formerly occupied from 800 to 2000 square km in southern Ontario. Today, less than 3% (or 21 square km) remains, supporting 20% of Ontario's rare plants (Lindsay Rodger, "Recovery of tallgrass species underway," *Recovery: An Endangered Species Newsletter* (Spring 1998), p. 1).

<sup>8</sup> R.F. Noss and A.Y. Cooperrider, *Saving Nature's Legacy: Protecting and Restoring Biodiversity* (Washington: Island Press, 1994), p. 5.

<sup>9</sup> E.O. Wilson, *The Diversity of Life* (New York: W.W. Norton & Co., 1992), p. 343.

<sup>10</sup> For impacts of agriculture and clear-cutting in southern Ontario see Riley and Mohr, pp. 30, 44. For a discussion on effects on pollination and mycorrhizal associations see B.T. Aniskowicz, *Endangered Plants and Invertebrates in Canada, Phase II: Recommendations for the Identification and Conservation of Endangered Invertebrates, Plants, Fungi and Algae*, (Ottawa: Canadian Nature Federation, 1994), p. 30.

<sup>11</sup> See, for example, G.P. Buchert, O.M. Rajora, J.V. Hood and B.P. Dancik, "Effects of Harvesting on Genetic Diversity in Old-Growth Eastern White Pine in Ontario, Canada," *Conservation Biology*, 11:3 (1997), pp. 747-758.

<sup>12</sup> Government of Canada, *The State of Canada's Environment 1996* (Ottawa: Government of Canada, 1996), p. 14-5.

<sup>13</sup> See, for example, M. Hummel and A. Hackman, "Introduction," *Protecting Canada's Endangered Spaces*, M. Hummel, ed. (Toronto: Key Porter Books Limited, 1995), p. XI regarding support for the Endangered Spaces campaign.

<sup>14</sup> See, for example, Angus Reid Group, *Public Support for Endangered Species Legislation* (June 1995): 94% of Canadians support endangered species legislation; and Canadian Facts, *Endangered Species Legislation Multifacts* (December 1996): showing similar results. See also, M. Hummel, "The Upshot," *Endangered Spaces: The Future for Canada's Wilderness*, M. Hummel, ed. (Toronto: Key Porter Books, 1989), p. 269; and Federation of Ontario Naturalists (FON), *Attitudes of Ontario Residents Towards Public Lands and Wilderness Issues* (Poll conducted by Oracle Research) (November 1997), pp. 10 & 17 which found that 71% of Ontarians believe that setting aside 20% of publicly-owned land for wilderness protection was too little or just the right amount (20% felt that it was too much). The figures for northern Ontario were 91% and 5% respectively. A government study conducted in 1991 found that over 84% of Ontarians felt that maintaining abundant wildlife and preserving endangered species was very or fairly important (F.L. Fillion, E. DuWors, P. Boxall, R. Reid, P. Bouchard, P.A. Gray, A. Bath, G. Legare and A. Jacquemot, *The Importance of Wildlife to Canadians: Highlights of the 1991 Survey* (Ottawa: Environment Canada, 1993), p. 52.

<sup>15</sup> G.P. Nabhan, *Cultures of Habitat: On Nature, Culture, and Story* (Washington D.C.: Counterpoint, 1997), p. 37.

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- <sup>16</sup> In D.M. Warren, "Conservation of Indigenous Knowledge Serves Conservation of Biodiversity," *Alternatives Journal*, 23:3 (1997), pp. 26-27.
- <sup>17</sup> N. Blanchet-Cohen, *Strategies for a Living Earth: Examples from Canadian Aboriginal Communities* (Ottawa: Biodiversity Convention Office, Environment Canada, 1996), p. 2.
- <sup>18</sup> Wake, p. 56; and Blanchet-Cohen, pp. 10-14.
- <sup>19</sup> J-M. Daigle and D. Havinga, *Restoring Nature's Place: A Guide to Naturalizing Ontario Parks and Greenspace* (Schomberg, Ont.: Ecological Outlook Consulting, 1996), pp. 148-149.
- <sup>20</sup> Riley and Mohr, pp. 6-8. The precautionary principle has been enshrined in the *Convention on Biological Diversity*.
- <sup>21</sup> Riley and Mohr, p. 66.
- <sup>22</sup> Aniskowicz, p. 15.
- <sup>23</sup> Aniskowicz, pp. 14-16.
- <sup>24</sup> Government of Canada, p. 14-10.
- <sup>25</sup> Riley and Mohr, p. 21.
- <sup>26</sup> Such as Wood Thrush, Veery, Ovenbird, Nashville Warbler, Scarlet Tanager, Canada Warbler, Red-shouldered Hawk, Pileated Woodpecker (Riley and Mohr, p. 23)
- <sup>27</sup> WWF (1994), p. 2.
- <sup>28</sup> Riley and Mohr, p. 21. See also, C.M. Pearce, "Coping with Forest Fragmentation in Southwestern Ontario," *Size and Integrity Standards for Natural Heritage Areas in Ontario*, S.F. Poser, W.J. Crins and T.J. Beechey, eds. (Toronto: Queen's Printer, 1993), pp. 100-113.
- <sup>29</sup> Riley and Mohr, p. 10.
- <sup>30</sup> Riley and Mohr, pp. 27 & 31.
- <sup>31</sup> R. Reid and R. Symmes, *Conservation Strategy for Carolinian Canada: Summary Report* (Carolinian Canada Steering Committee, March 1997), p. 2.
- <sup>32</sup> J. Riley, *1997 Scan of Natural Heritage Conservation in Ontario* (Don Mills, Ont.: Federation of Ontario Naturalists, December 1997), p. 3.
- <sup>33</sup> R. Reid, R. Symmes, D. van Hemessen, *Towards a Conservation Strategy for Carolinian Canada: Issues and Options* (Carolinian Canada Steering Committee, September 1996), p. 21.
- <sup>34</sup> Riley and Mohr, p. 19.
- <sup>35</sup> Wildlands League (WL), *The State of Ontario's Forests: Biodiversity at the Crossroads* (Toronto: WL, undated pamphlet), p. 2.
- <sup>36</sup> Partnership for Public Lands, *It's Your Land: Completing Ontario's System of Parks and Protected Areas* (Toronto: Partnership for Public Lands, undated pamphlet).
- <sup>37</sup> L.J. Evans Ogden, *Collision Course: The Hazards of Lighted Structures and Windows to Migrating Birds* (Toronto: WWF and Fatal Light Awareness Program, 1996), p. 2.
- <sup>38</sup> Government of Canada, p. 14-14; and Environment Canada, *Conserving Wildlife Diversity: Implementing the Canadian Biodiversity Strategy* (Hull: Environment Canada, 1998), p. 22.
- <sup>39</sup> T. Mosquin, P.G. Whiting and D.E. McAllister, *Canada's Biodiversity* (Ottawa: Canadian Museum of Nature, 1995), p. 138.
- <sup>40</sup> Mosquin, Whiting and McAllister, p. 25.
- <sup>41</sup> D.E. McAllister, *Water: The Essence of Life or a Silent Threat? The implications of the discharge of toxic substances into marine and freshwater environments* (Ottawa: Ocean Voice International, May 1988), p. 3. See also, Province of Ontario, *Guide to Eating Ontario Sport Fish 1997-1998* (Toronto: Queen's Printer, 1997).
- <sup>42</sup> International Joint Commission, *Seventh Biennial Report under the Great Lakes Water Quality Agreement of 1978* (Ottawa: International Joint Commission, 1994), p. 4.
- <sup>43</sup> WWF (1994), pp. 1-2.
- <sup>44</sup> WWF (1994), p. 17.
- <sup>45</sup> Environment Canada, *Biodiversity in Canada: A Science Assessment for Environment Canada* (Ottawa: Environment Canada, 1994), pp. 82-83.
- <sup>46</sup> WWF (1994), p. 11.
- <sup>47</sup> WWF (1994), pp. 7-8.

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- <sup>48</sup> Government of Canada, p. 14-12.
- <sup>49</sup> W. Ashworth, *The Late Great Lakes* (Toronto: Collins, 1986), pp. 112-122.
- <sup>50</sup> Provincial Auditor, *1998 Provincial Auditor's Report* (Toronto: Queen's Printer, 1998), p. 176.
- <sup>51</sup> See, S. Crawford, *A Review and Ecological Evaluation of Salmonine Introductions to the Great Lakes: A Report Prepared for the Chippewas of Nawash First Nation* (Warton, Ont.: Chippewas of Nawash First Nation, 1997).
- <sup>52</sup> See, Bluewater Network, *Jet Skis Position Paper* (San Francisco: Bluewater Network (<http://www.earthisland.org/bw/>)).
- <sup>53</sup> Government of Canada, p. 14-13.
- <sup>54</sup> Great Lakes United (GLU), *Great Lakes United Coalition Policy Resolutions adopted at the 1993 Great Lakes United Annual General Meeting* (Buffalo: GLU, June 1993); and Environment Canada (1994), pp. 151-152.
- <sup>55</sup> Mosquin, Whiting and McAllister, pp. 64-66
- <sup>56</sup> GLU, *Our Lakes, Our Health, Our Future: ENGO Presentation Summaries to the November 1997 IJC Public Forum* (Buffalo: GLU, November 1997).
- <sup>57</sup> Mosquin, Whiting and McAllister, pp. 61-63.
- <sup>58</sup> Environment Canada (1994), p. 158.
- <sup>59</sup> Environment Canada (1994), p. 161.
- <sup>60</sup> Wilson (1992), p. 271.
- <sup>61</sup> Wilson (1992), pp. 271-272.
- <sup>62</sup> Wilson (1992), pp. 271-272.
- <sup>63</sup> J.B. Theberge, "Tooth and Claw: The Mammals of Ontario," *Legacy: The Natural History of Ontario*, Theberge, ed. (Toronto: McClelland & Stewart Inc., 1989), p. 202.
- <sup>64</sup> Environmental Commissioner of Ontario (ECO), *Open Doors - Ontario's Environmental Bill of Rights: 1997 Annual Report* (Toronto: ECO, 1998), pp. 3, 6, 18.
- <sup>65</sup> See, for example, Environment Canada (1998), p. 18.
- <sup>66</sup> ECO, p. 4.
- <sup>67</sup> ECO, p. 8.
- <sup>68</sup> ECO, p. 8.
- <sup>69</sup> Provincial Auditor, p. 176.
- <sup>70</sup> ECO, p. 47.
- <sup>71</sup> J. Corsiglia and G. Snively, "Knowing Home: Nis Ga'a Traditional Knowledge and Wisdom Improves Environmental Decision-making," *Alternatives* 23:3 (1997), pp. 22-27.
- <sup>72</sup> P. Cizek, "Guardians of Manomin: Aboriginal Self Management of Wild Rice Harvesting," *Alternatives* 19:3 (1993), pp. 29-32.
- <sup>73</sup> ECO, p. 5.
- <sup>74</sup> ECO, pp. 9-10, 70-71.
- <sup>75</sup> See, for example, B.K. MacKay, "Snow Geese and the Final Solution School of Wildlife Management," (<http://www.api4animals.org/Column06.htm>) (1997).
- <sup>76</sup> See, E. Shilts, "What's Good for the Goose," *Canadian Geographic* 118:4 (1998), pp. 70-76.
- <sup>77</sup> Aniskowicz, p. 2; ECO, p. 8.
- <sup>78</sup> ECO, p. 45.
- <sup>79</sup> Sierra Legal Defence Fund (SLDF) and WL, *Cutting Around the Rules: The Algoma Highlands pay the price for lax enforcement of logging rules* (Toronto: SLDF and WL, 1998), p. 21.
- <sup>80</sup> ECO, p. 43.
- <sup>81</sup> "Algonquin Wildlands League v. Ontario (Minister of Natural Resources), Ontario Court (General Division) - Divisional Court," *Canadian Environmental Law Reports (New Series)*, 26 (1998), pp. 163-219; Algonquin Wildlands League v. Ontario (Minister of Natural Resources), Court of Appeal for Ontario, File Nos. C29652 and C29654 (October 27, 1998).
- <sup>82</sup> Environment Canada - Canadian Wildlife Service, MNR, FON, Nature Conservancy of Canada, *Great Lakes Wetlands Conservation Action Plan, 1994-2001: First Progress Report* (Toronto: Nature Conservancy of Canada and Environment Canada, October 1997), p. 22.



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- <sup>84</sup> Riley and Mohr, p. 66.
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**AT WORK IN THE NATURAL WORLD:  
FORESTRY AND MINING**

**By Brennain Lloyd & Catherine Daniel**

**Prepared for**

**The Environmental Agenda for Ontario Project**

**March 1999**



## SUMMARY

### Current Status

Two provincial ministries vie for position of top dog on crown land, each with its own mandate and set of industrial clients. To some degree, the tension between these ministries is a reflection of the tension among public users of crown land, including resource industries, recreationists, fishers and hunters, and others who rely on the land for food, solace, or livelihood. Both ministries have suffered severe cutbacks in recent years, beginning under the Rae government and intensified under the Harris regime. But the third regulatory player - the Ministry of the Environment (MOE) - has been hit most severely, with a 40% reduction in staff overall, and with district offices collapsed and now only one regional office in all of northern Ontario. That office, located in Thunder Bay, is now left with a service area that is more than a twenty-four hour drive from one end to the other.

In the last few years, significant changes have been made to the way crown lands are managed, and to how management decisions are made. Three stand out in particular: an 80% roll-back of permitting requirements for (mostly industrial) activities on crown land; creation of a new land use zoning that could transfer all authority from the government (and so the public) to an individual or corporation (i.e., to the private interest); and a land-use planning exercise heavily weighted to industrial uses.

Two major forces are at work in Ontario's forests, each with a common master: the unquenchable industrial thirst for fibre. The first force, fire suppression, has been in effect for the last 80 years, and its effect perhaps less easily measured. The second force, the mechanical harvesting of trees for fibre, has been in place for only the last few decades, and its effect is enormous. In combination - although there is little argument that the timbering practices are the greater source of impact - these two forces have changed the face of the forest. For example, in the boreal forest, spruce has dropped from making up 18% of the forest to only 4%, while hardwoods have jumped from 6% to 19%. In the Great Lakes-St. Lawrence, white pine has been reduced to less than 2% from its pre-industrial estimate of between 30 and 40%. And so the species composition is being severely skewed.

The crisis is not limited to the natural communities. Human communities too, with their reliance on the forest as a source of employment, recreation, and food, are being adversely affected by the changes being borne by today's forest, perhaps most measurably by dropping employment levels in the forest products industry. Over the last several decades, the amount of forest cut has steadily increased, while the level of employment in the forest industry has steadily decreased. This ratio - profitable for the major forest companies, but dissatisfying from any social or environmental perspective - is a result primarily of mechanization in both the timbering operations and the mills. Other influences have been the concentration of capital, as smaller companies are bought up by larger ones, and of mills being over-built (that is of having more capacity than they have supply).

Ontario continues to have the largest metal mining sector of all the provinces in Canada, and accounts for one-third of national mineral production, with 41 metal mines in operation and

another 16 in stages of advanced exploration. But the legacy - over 6,000 inactive or abandoned mines - are as much a part of the picture as the current production, each with safety and environmental hazards that must be remediated, but with no funding allocated to do so.

A major feature of mining is that it produces an extremely high volume waste: waste in the form of rock, or rock that has been crushed into fines at the mill and rejected, called tailings. Most base and precious metals are found in ore bodies at concentrations of only a few percent, even tenths of a percent. A typical Canadian metal mine rejects 42% of total mined material as waste rock, 52% as tailings, 4% as slag, with the remaining 2% comprising the values for which the ore was mined. Most ore that is mined contains metal sulphide mineralization, so the rock is crushed and exposed to oxygen and water, it begins to oxidize producing sulphuric acid. The acid further dissolves metals in the rock and creates acidic drainage containing potentially toxic metals. This phenomenon is known as Acid Mine Drainage, and it is the mining industry's greatest environmental liability. Federal estimates of cleanup costs for acid mine drainage at existing mines are between \$ 2 billion and \$ 5 billion.

Provincial regulations have been weakened, while environmental costs of mining activities are continually escalating. For example, in 1995, the Ministry of Environment and Energy amended the MISA regulation to clarify the non-application of the regulation to closed mine sites. In 1996, changes to the Mining Act exempted mines from having to gain Ministry approval for mine closure plans, and made the requirements for posting financial assurances to cover the costs of mine closure discretionary.

On average, one of every four mines either failed toxicity tests or had a temporary exemption from MISA regulations for the winter of 1997 and the spring/summer of 1998. Industry is now proposing that toxicity monitoring under MISA remain "as a legal requirement, but that non-lethal effluents be identified as an objective under the regulation rather than a compliance requirement." - in short, that the bar be lowered in this standard as it has been in so many others.

### **Causes of the Problem**

While the problems are diverse, some of the root causes are the same: lack of community or public control over public lands and the public resource; continued de-regulation or lowering of environmental standards; and concentration of corporate ownership, many of them international companies with no ties to local communities or relationship to the lakes, rivers and forests being impacted by their operations. Mechanization has resulted in increased production and so increased pollution in the mineral sector, and increased rates of harvest and physical impacts on the forest floor and composition in the forest sector. In both sectors, the role of mechanization has been to reduce the workforce and to further concentrate access to the resource, through the increased capital demands of automated operations. And in both sectors, over-consumption, the force of global markets in driving and keeping prices down, and the failure to conserve the resource through re-use and recycling of products have had their negative effects.

### **Agenda for Change**



The forests' future does not have to be bleak. Choices must be made, but the choices are there. In essence, we can go two routes: the route of the status quo, or the route of the second chance. The route of the status quo means more of the same - increasing cut, decreasing jobs, an increasingly more stressed and disturbed forest, fewer opportunities for economic diversity and ever diminishing forest diversity.

The route of the second chance means just that - a second chance at building community stability, at restoring forest health, at achieving sustainability for the human and natural communities. What would it look like? Forest management practices would put the forests first, and profits second, or even a distant third to healthy woods and a full workforce. Decisions would be made for the longer term, with community involvement and scientific support. Local economies would be diversified, with the wild food gatherer, the eco-tourist operator and the logger planning for the shared needs of the community and each other. Timber supplies would be tied to local communities, and value added and high value wood products would be the focus of an industrial strategy that was value-based rather than volume-based.

In the mineral sector, decisions about mineral development must be brought into the realm of public influence - to borrow from the trade tables, there should be a level playing field among the various interests on crown land, and mining should no longer rule supreme. Mining activities should be regulated in an open and transparent fashion, with a high standard of care demanded for the lands and the waters that mining activities affect. This means no discharge of toxic effluent, no net loss of habitat, and reclamation of mine sites. This means the "right to mine" claimed by industry and granted by government for the last century must be reconsidered within a reasonable array of rights - rights to a healthy environment, rights of the natural environment, and rights to clean air, water and land.

Minerals are durable and can be effectively recycled. Ultimately, we must examine the role that minerals and the mineral development industry should play in a sustainable economy and society. Gains can be made through reduction in consumption, eco-efficient extraction, production and design, and maximizing rates of metals recovery and re-use.

### **Key Recommendations**

1. Strengthen the public role in decision-making around activities on crown land, including the disposition of crown lands, forest management activities, and access for mineral exploration and extraction.
2. Ensure that aboriginal lands uses and rights are secure, and that aboriginal communities and First Nation forestry operations have fair access to both the timber resource and resource management decision-making, have influence over decisions related to mineral development, and have opportunities for co-management.
3. Complete the system of protected areas, ensuring that Ontario's natural systems are represented across the province, and that areas are of sufficient size and integrity to allow natural processes to take place, such as fire. These areas must be free of mining, logging or

hydro-electric development.

4. Establish a process to replace corporately owned Sustainable Forest Licenses with community forest authorities, which plan for a mixed local economy and a mix of forest uses, including recreation, scientific study, tourism, gathering, careful timbering, and responsible mining.
5. Require forest management companies to demonstrate that their operations are sustainable, and give priority to those operators that bring the greatest benefit to the community (i.e., Value-added activities, employment levels) and that are least reliant on an expanded road network and/or use of pesticides.
6. Complete the inventory and site assessments of abandoned mines. Provide adequate funding (e.g. unfreeze and increase mining taxes) to begin reclaiming high priority sites. Identify companies owning inactive mines and require them to complete mine closure at their expense. Establish a joint government-industry fund to reclaim remaining sites.
7. Enforce a schedule for compliance for mines to meet discharge requirements, including toxicity testing. Design and apply regulations that address effluent discharge at inactive, abandoned and closed mine sites.
8. Use and reuse natural resources - including forest fibre and minerals - more efficiently.

Authors:

Northwatch activists, Brennain Lloyd and Catherine Daniel, co-wrote this paper. Brennain is past chair of the Old Growth Forest Advisory Committee to the Minister of Natural Resources, and has authored a number of popular education pieces on forest concerns and land-use planning on crown lands. Brennain is project coordinator with Northwatch, and facilitates and supports Northwatch's work on forestry, mining and energy development concerns. Catherine is a biologist and a soil science researcher, with particular expertise in the area of mine site rehabilitation. Catherine is an active member of Northwatch and Northwatch's Mine Impacts Working Group. Both reside in northeastern Ontario.

Acknowledgements:

The authors thanks those who reviewed the first draft of this paper and contributed considerably to its final content: Linda Pim, Margaret Casey, Mark Winfield, Elizabeth Wharton, Helen Forsey, Sharon Gow, and Bob Gibson.



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## AT WORK IN THE NATURAL WORLD: FORESTRY AND MINING

### ONTARIO'S CROWN: THE LANDS AND FORESTS

Ontario was built on its natural resources. From the pine masts that were pulled from the Ottawa Valley to outfit the Royal Navy of Great Britain in the 1700's to the nickel of the Sudbury basin that furnished the second world war, Ontario's coffers have been filled and its place at the national and international tables of trade and commerce bought and paid for by the province's natural resources. To this day the felling of northern forests and the mining of northern rock largely fuel the provincial economy. And today - and tomorrow - the lands and waters pay for the wealth the people of Ontario have enjoyed.

Ontario is over 100 million hectares in size, with 88%<sup>1</sup> of that land being held under crown ownership, or publicly owned land (within the inventoried area, or area where industrial forestry takes place, 78% is crown land, with the remaining being 21% in privately held land, and 1% in federal lands, including First Nations lands<sup>2</sup>. The term crown land dates back to the earlier colonization of what now makes up Ontario, which was taken as the territories of the reigning monarch of Great Britain. Some references describe the term crown as having derived from an understanding that the land was being held in trust by the crown, i.e., the king or queen, for the native people.<sup>3</sup> In current terms, the primary distinction is that crown land is owned by the public and managed by the government on behalf of the people of Ontario; land which is not crown land is either private land, held by individual or corporate owners, federal land, or land owned by municipalities or counties. First Nations reserve lands are classified as federal land, while land under aboriginal claim or part of a treaty or traditional native territory is generally crown land, but can also include privately held lands.

Most forestry and mining activities take place on crown land, and competition for access to the land base heightens with each passing decade. While the mining and forestry industries assume, based on traditional access and historical use patterns, that their interests are paramount, other users and other values are championed by the public as deserving equal or even greater consideration. While the forest industry makes claims for "every stick"<sup>4</sup> of wood and the mining lobby demands access to every hectare of public land,<sup>5</sup> the public has become increasingly more sophisticated in describing a different vision and a different set of priorities for crown land management: connecting corridors for wildlife, restricted access for motorized vehicles, community control over the allocation of timber rights, protection of tourism values, and concerns for climate change and species loss.

#### **Who calls the shot on crown lands?**

Two provincial ministries vie for position of top dog on crown land, each with its own mandate and set of industrial clients. To some degree, the tension between these ministries is a reflection of the tension among public users of crown land, including resource industries, recreationists, fishers and hunters, and others who rely on the land for food, solace, or livelihood.

The Ministry of Natural Resources (MNR) has primary responsibility for managing forests, fish and wildlife, and aggregates on crown land. MNR also has primary responsibility for controlling water levels

<sup>4</sup> *At Work in the Natural World*

and licensing water use, such as hydro-electric dams. The Ministry of Northern Development and Mines (MNDM), champion of the mineral exploration and development sector, has a two-fold mandate: economic and social development of northern Ontario and to "encourage and regulate the orderly development and utilization of the province's mineral resources".<sup>6</sup> Invariably, this Ministry sees those two goals as the same - mineral development and social development are married in both the Ministry's mandate and its fundamental approaches to both economic development and crown land access.

Both ministries have suffered severe cutbacks in recent years, beginning under the Rae government and intensified under the Harris regime. But the third regulatory player - the Ministry of the Environment (MOE) - has been hit most severely, with a 40% reduction in staff overall, and with district offices collapsed and now only one regional office in all of northern Ontario. That office, located in Thunder Bay, is now left with a service area that is more than a twenty-four hour drive from one end to the other.

In the last few years, significant changes have been made to the way crown lands are managed, and to how management decisions are made. Three stand out in particular: an 80% roll-back of permitting requirements for (mostly industrial) activities on crown land;<sup>7</sup> creation of a new land use zoning that could transfer all authority from the government (and so the public) to an individual or corporation (i.e., to the private interest);<sup>8</sup> and a land-use planning exercise heavily weighted to industrial uses.<sup>9</sup>

By the mid-1990's, a land-use permitting system had evolved over decades to a point where industrial and other users required land-use or work permits for many of those activities that had the potential to be harmful to the environment or to destroy the natural values of a given area. Permits were required under legislation for activities such as construction of buildings on crown land, any shoreline alterations such as docks or bridges, and alterations to the land through trenching, road construction, and removal of the plant communities on the land surface. Under Bill 26, the requirement for these permits was moved from legislation to regulation, and approximately 80% of the requirements for permits were dropped in the shuffle.<sup>10</sup> There are several consequences of this: the standard of care will drop on crown lands; the setting of permitting requirements is one-step removed from the public domain; and the level of conflict among uses and users in the bush can be expected to increase in the absence of any orderly consideration of what activities are taking place in which areas. From a practical perspective, human safety also suffers, given that the abandonment of the permitting system means there is no longer a tracking system in place and it will be far more difficult to locate people who are working in the bush and do not return when expected, or to evacuate them in times of crisis.

With the new ability to create "land use zones" under the Public Lands Act,<sup>11</sup> another tool now exists to

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#### **Crown Lands on the Real Estate Market**

Rumblings about Crown land sales begin to appear within the MNR field level staff in the winter of 1997. Crown land sales have always occurred at some low level, and usually without public consultation or broad public knowledge. In 1997, \$5 million worth of land was sold and now the MNR Districts and Regional Offices are being asked to develop targets for increasing this form of non-tax revenue. It has been determined that 33 properties had been sold since April 1997 and 83 more were scheduled to be sold by March 1998. Future targets, indication of planned public consultation, or any sales criteria are unavailable. The market for crown land disposal appears to be almost unlimited if the price is right. [Wildlands League, May 1998]



remove or severely restrict public influence - and even information - on activities and control of crown land. While it also has the potential to be a positive tool, and allow delegation to community planning boards or for educational or recreational purposes, the new ability to create land use zones also allows delegation of authority and all decision-making to single interests or industry. Potentially, a forest industry could be granted full control of large tracts of public land, and restrict or prohibit all other uses while exploiting the land for their singular benefit. Thirdly, Ontario's 1997/1998 land-use planning process, Lands for Life, is a classic example of a fundamentally sound idea - to conduct an orderly planning process for crown land uses in Ontario - gone badly wrong. Following a decade of forest policy development and a decade and half after the last land use planning process had been completed, Lands for Life should have been an opportunity to examine patterns of crown land use, assess the environmental health of the forest, and consider the social expectations of Ontario's public lands. Instead, the process was set up to divide north and south, to favour industrial interests, and to provide a distance between the public and the provincial government. Forty-six million square kilometres - the majority of Ontario's forested land - was declared to be the planning area, and three regional roundtables were established for approximately equal portions of that territory. The Roundtables were given a nine-month mandate, which was later extended to twelve and then still later to fifteen months, to complete the massive task of redesigning land use patterns and designations on crown land. Told to address protected areas, the needs of the resource-based tourism industry, and sustainable forestry, the Roundtables were given too little time, conflicting instructions from the Minister of Natural Resources, and inadequate information and scientific support. The result: more conflict rather than less, and a land use plan that fails on all counts.

On October 30, 1998, the Minister of Natural Resources John Snobelin released a consolidated chairs' report containing the 242 recommendations of three regional roundtables. The report was an overflow of often conflicting recommendations, which not only fail to complete the system of protected areas, but also increase the demands on the land base both inside and outside of parks and conservation reserves. Three themes emerged in an analysis of the recommendations: confirmation of the status quo (respecting aboriginal rights as recognized in the constitution, but with no concrete action to reflect aboriginal authority or respond to First Nations land rights); increases in the levels of every form of consumption and commodifying of natural resources, including increased fishing, hunting, access for mineral exploration and extraction and continued near-total access of the forest industry; and a shortchanging of other values and particularly of the invaluable qualities of the wild forest. The reports were available only on request, and in many areas residents had to sign for a copy at the district office of the MNR, or attempt to download it from an often inaccessible government website, cutting the time even shorter than the 30 days allowed for public comment. Phase one? Strike one.

### **Recommendations for Crown Land Management**

1. Complete the system of protected areas, ensuring that Ontario's natural systems are represented across the province, and that areas are of sufficient size and integrity to allow natural processes to take place, such as fire.
2. Create a public role for decision-making around any disposition of crown lands. Ensure that all sales

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of crown lands to industrial, commercial or private interests gain fair market price, and that public access to crown land for recreation and gathering is not restricted. Any proposal for disposition of crown land should be posted on the Environmental Bill of Rights' electronic registry, as a minimum for public notice.

3. Revise the permitting process for crown land uses to ensure fairness and security for all forest users, including trappers, crafters, recreationists, and food gatherers.
4. Limit any agreement to delegate to private interests any authority over crown lands (i.e., under the Public Lands Act). Ensure that such delegation can be done only after public consultation, is limited in scope, and takes into account other interests, particularly aboriginal interests. Appeal mechanisms must be in place to settle disputes, and any delegation must be repealable. Any proposal for delegation of authority over crown land should be posted on the EBR electronic registry, as a minimum for public notice

## ONTARIO'S FORESTS - WHAT FUTURE?

### Introducing the Forests

Ontario's forests are rich and varied. Three major forest regions occupy the province, each with their distinctive terrain, tree and plant species, and wild life. And each with its own pattern of industrial exploitation, corporate ownership, and forest decline.

Forests are shaped and formed by many influences. The natural forces of climate, landform and soils are the first and most enduring forces on the forest estate, determining which tree and plant species will occupy each site, and their rate of growth and resilience. For example, climate influences through temperature, growing season and precipitation; landforms determine the altitude, and degree and direction of the slope a forest community resides on; and soils influence where and how forests grow, while the forests, in turn, influence the soils. Characteristically, northern forests have layered soils that are acidic and low in nutrients, and organic matter decomposes slowly. In the south, brown forest soils are more nutrient-rich, and decomposition and nutrient cycling are more rapid. Precipitation also has a major influence on the frequency, intensity and size of fires, which play a large role, as a form of natural disturbance, in forest regeneration and succession.<sup>12</sup>

### Ontario's Forest Estate

Three of Canada's eight forest regions - the Boreal, Great Lakes-St. Lawrence and Deciduous (also called the Carolinian) - are found in Ontario. Boundaries between the regions are not sharp lines but are more transition zones, and many species - tree, animal or plant - are found in more than one region.

#### *Boreal*

Part of a band of forest circling the northern globe, the Boreal forest is the largest forest region in Ontario, consisting of 43 million hectares, stretching from the northern limits of the Great Lakes-St. Lawrence forest to Hudson Bay (including the Hudson Bay lowlands, which have a sub-arctic climate and are sometimes defined as a separate and unforested region). This forest region contains nearly 38 million hectares of productive forest land; the dominant species are white and black spruce, jack pine, balsam fire, trembling aspen, and white birch.

The Boreal forest is a fire-driven ecosystem; the forest species and the mosaic of forest communities are greatly influenced by the size, intensity and frequency of fires that have burned across the landscape. Fire suppression and extensive cutting are two human influences that have shifted the course of forest succession over much of the boreal landscape.

#### *Great Lakes-St. Lawrence*

The Great Lakes-St. Lawrence forest region occupies the central region of the province, with the greatest concentration of the forests occurring north and east of Lake Huron and in a Great Lakes - Boreal transitional zone from Thunder Bay to Fort Frances. The region is 22.3 million hectares in size, of which 54% is forested, with 47% of it in productive forest. Dominant species are red and white

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pine, red and white oak, hemlock, white birch, yellow birch and ash, with maple as the most abundant tree.

The Great Lakes-St. Lawrence has dramatic topography, including the highest points of land in Ontario, and at points is intersected by the height of land that divides the Atlantic and Arctic watersheds. It also includes dramatic differences in land ownership, ranging from 95% crown land in the northwest to only 15% crown land in the southern portions.

Despite two centuries of logging, some remnants of the original forest remain. Tourism and recreation are important players in the region's economy, with the mining and forest companies contributing to varying degrees, community by community and year by year.

### *Deciduous/Carolinian*

The most heavily impacted by urban and agricultural development, the Deciduous forest of southern Ontario is 3 million hectares in size, but less than 15% remains in forest; in some counties, the forest cover is less than 3%. Only 8,200 hectares, or 0.003% is public land; more than 99% is in private ownership, of which 75% is agricultural land.

This southern Ontario forest is a small portion of the Deciduous Forest region, which is widespread in the United States. Rich soil and a climate moderated by the Great Lakes support a diverse mix of trees and other life. Many deciduous tree species reach their northern limits - tulip tree, cucumber tree, Kentucky coffee tree, black gum and pin oak - and most of Ontario's black walnut, sycamore and swamp white oak trees grow here. A number of species that occur here are found nowhere else in Canada, such as the southern flying squirrel, pine vole, red-bellied woodpecker, and Carolina wren. A number of species are considered threatened or endangered.

### **A Changing Forest**

Ontario's forest is changing. Without doubt, change in a natural system is not only inevitable; it is a positive and necessary experience. Just as a person changes throughout their life, from childhood to adulthood, from one set of interests or occupation to another, so too does a forest change over time in its age and mix of species and wildlife occupants. Industry spokespersons and government apologists will press the point that the forest is not in a static state when they respond to public concerns about the rapid rate of change being wrought by modern forest practices. But here's the rub: while forest succession takes place over hundreds or even thousands of years, in response to gradual changes in climate and forest conditions, the changes wrought by industrial forest practices change the face of the forest in days, if not hours.

Two major forces are at work in Ontario's forests, each with a common master: the unquenchable industrial thirst for fibre. The first force, fire suppression, has been in effect for the last 79 years;<sup>13</sup> its effect is perhaps less easily measured. The second force, the mechanical harvesting of trees for fibre, has been in place for only the last few decades; its effect is enormous.

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As a form of natural disturbance, fire plays a major role in forest regeneration and succession. A healthy forest is a mosaic of age classes and species; the effect of fire suppression has been to skew that mix or mosaic. With more effective fire suppression over the past 75 years, fire frequency, or the interval between fires, has decreased; this has affected the age class distribution of forests, particularly in the Boreal Forest. Stands that normally would have burned in the days before fire suppression, now continue to age. Prior to 1920, approximately 700,000 ha. of forest burned each year. By 1996, only 80,000 ha. burned each year, while approximately 200,000 ha. were timbered. While timber operations are also a disturbance to the forest, there is little resemblance between fires and logging; in many instances they have the exact opposite effect to each other. For example, a fire through a conifer forest will regenerate to conifers, while a harvest operation through a conifer forest will convert to hardwoods; a fire will leave behind a patchwork of burnt and unburnt areas, while a clearcut will leave behind only a swath of broken tree limbs and rutted soil.

Fires are suppressed to guard the fibre source for industrial uses. Once fire has been suppressed and the forest becomes dominated by older aged forest stands, the forest industry uses this as a rationale to cut further and faster, describing the forest as about to fall over an age precipice, rendering it less valuable for commercial interests.

In combination - although there is little argument that the timbering practices are the greater source of impact - these two forces have changed the face of the forest. For example, in the boreal forest, spruce has dropped from making up 18% of the forest to only 4%, while hardwoods have jumped from 6% to 19%.<sup>14</sup> In the Great Lakes-St. Lawrence, white pine has been reduced to less than 2% from its pre-industrial estimate of between 30 and 40%.<sup>15</sup> And so the species composition is being severely skewed.

### **The Forest Crisis**

The crisis is not limited to the natural communities. Human communities too, with their reliance on the forest as a source of employment, recreation, and food, are being adversely affected by the changes being borne by today's forest, perhaps most measurably by dropping employment levels in the forest products industry.

Over the last several decades, the amount of forest being cut has steadily increased, while the level of employment in the forest industry has steadily decreased. This ratio - profitable for the major forest companies, but dissatisfying from any social or environmental perspective - is a result primarily of mechanization in both the timbering operations and the mills. Other influences have been the concentration of capital, as smaller companies are bought up by larger ones, and of mills being over-built (that is of having more capacity than they have supply).

The trend towards fewer workers and more wood cut has been steady; its results have been profound. In the mid-1950's, the chainsaw was introduced, doubling what one cutter could fell in a day. By the late '50's, skidders were being tested to replace teams of horses and their handlers, and in 1959 a machine called the Feller Buncher was introduced - a single machine that could cut and load trees by the transport. By 1970, a harvester had been built that could replace an entire crew with a single person, and

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in the '90's, computer-aided harvesting machines can measure, cut, delimb and load a tree with the press of single button.<sup>16</sup>

This has had three outcomes, none of them particularly friendly to the forest or the forest workers: the machines replace workers, at a rate of approximately 12:1; the machines are best suited to large block and serial clear-cutting, i.e., those harvest methods most damaging to forest diversity; and the machines are incredibly capital intensive. The cost of a single machine and the business pressure to regain on the investment drives the pace of harvesting, in some cases resulting in round the clock cutting.

Government estimates are that for every one direct job created in the forestry industry in northern Ontario, one indirect job in northern Ontario and another in southern Ontario are created.

A similar trend has played out in the mills. In the late 80's and early '90's many of the pulp and paper mills experienced downturns due to mill inefficiencies, a glut in the market, and a shift to

demand for recycled products, which the Canadian companies were slow in responding to. As companies began experiencing an upswing in the market and in commodity prices in the mid to late 1990's, industry continued to implement restructuring and job reductions, moving in the direction of high volume and intensely mechanized production, with an approximate 45% reduction in the work force.<sup>17</sup>

Unless changes are made, the situation can expect to worsen. In the absence of any countervailing force through either community-focused forest policy or a shift in forest management and allocation practices, Ontario's timber supply shortages will intensify as we move into the next century, and the trend towards concentrating capital and ownership can be expected to continue. Fewer companies holding more economic power will be competing for ever diminishing timber supplies.

Ontario's forest industry is occupied by many small operations, but dominated by only a few large companies. While government sources estimate that there are approximately 500 saw mills, the largest 10% deliver 90% of lumber production.<sup>18</sup> A handful of major players - most of them multinationals the likes of McMillan Bloedel, Kimberly-Clark, Domtar, and Abitibi-Consolidated - control most of the woodflow, and E.B.Eddy and Tembec appear to be methodically buying up the smaller family owned mills across the northeast, solidifying their control of timber allocations and their access to supply. By 1995, E.B. Eddy was managing over four and a half million hectares of land, and was one of the largest companies in both the sawmilling and pulp and paper sectors.<sup>19</sup> In mid 1998, Weston Foods sold E.B.Eddy to Domtar, continuing the trend of consolidation.

Over the last decade, wood supply shortages have been sporadic and relatively local - some mills have reduced their workforce or number of shifts, some have closed, and others have threatened to. Over the coming decades, the wood supply problems will reach a crisis, with the demand for timber climbing while the amount of available timber steadily drops.

But the crisis should come as no surprise. In the early 1970's, government studies showed that the amount of available wood had been exaggerated by as much as one-third;<sup>20</sup> in the mid-80's, an independent audit concluded that Ontario's inventory was shaky at best, and that it could provide only

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average estimates on parcels of thousands of hectares in size.<sup>21</sup> But in 1994, following an audit that showed the economic floor was dropping out of the boreal forest,<sup>22</sup> the Rae government perversely announced that the cut would be increased by up to 50%. Rather than deal with the supply crisis impending because of species conversion due to industrial forestry, the NDP Minister of Natural Resources Howard Hampton blithely turned the other cheek (or a blind eye, more precisely) and wrapped the economic and ecological disaster in a cloak of opportunity. New oriented strand board mills sprang up across the province to utilize the hardwoods that were now growing in the clearcuts where the conifer forest had once stood.

Five years later, the hardwoods are now all committed, the conifers overcommitted, and mills will face further reductions in timber supply for the next sixty years.<sup>23</sup> Over the next twenty years, demand is expected to increase by 50% while supply steadily decreases; this trend is expected to continue through to the year 2060. For conifers, some local and regional shortages will occur over the next twenty years, but overall shortages will hit by the year 2015. For hardwoods, the seeming supply of sawlogs is expected to increase over the next few years, but this is actually due to changes in mill technology to allow a greater variety of logs to be used, rather than an actual increase in timber supply. Two things should be noted with respect to the estimates of timber

supply: the estimates are optimistic, and assume changes to forest management that are not actually known to be taking place, and the supply crisis will have relatively the same effect over time, regardless of whether an additional 10% of crown lands is placed in park or protected area status. The OMNR's *An Assessment of Ontario's Forest Resources* modeled for two scenarios, one with additional protected areas and one without; in a period of just a few decades, the supply curves met.

Interestingly, while the supply crisis looms, and while government studies estimate that productivity could be increased by as much as 30% on some sites with increases to silvicultural work such as thinning and tending, the investment in silviculture has actually dropped by 20% since 1994.<sup>24</sup>

### **Who's in Charge in the Woods Today?**

Increasingly, industry calls the shots on the publicly owned land in Ontario. In 1985, 58% of crown land was licensed to the forest industry; by 1993, the number was 70%. The Harris government set a goal of 100% by April 1, 1998. While the target date was not reached, the target itself is still in the sight-line of the MNR, with negotiations ongoing or completed throughout 1998-1999.

This newest transfer of public lands to corporate control was made possible by changes to legislation brought in by former NDP Minister of Natural Resources Howard Hampton. Under the *Crown Forest Sustainability Act*, a tool was created for transferring the responsibilities of the Ministry of Natural Resources for planning, inventories, monitoring and silviculture to the forest industry. Called Sustainable Forest Licenses, these new instruments would give more responsibility to industry, but also

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more control, in the form of forest tenure roughly equivalent to that of a permanent tenant - but the rent would be cheap, and utilities paid for, and the lease almost impossible to break, at least not without penalty to the landlord. With the Conservative government's arrival to power, MNR staff was severely downsized, and the process for signing off of public land to the industry through Sustainable Forest Licenses was fast-tracked for all remaining management units, with almost no public consultation and very little public information.

But in the same year that the NDP government was drafting the *Crown Forest Sustainability Act*, an almost decade-long environmental assessment hearing concluded in April 1994 with 115 conditions being placed on the management of crown lands for the production of timber. The *Class Environmental Assessment of Timber Management on Crown Lands in Ontario* produced thousands of pages of documents, and relied on hundreds of witnesses. The panel's decision was that the Ministry of Natural Resources had approval to proceed with planning and approvals of logging and the related activities of road-building and regeneration, but that a number of changes had to be made in MNR practices, and a number of requirements had to be met.

Key among them was Condition 77, which required MNR to negotiate directly with First Nations communities to increase timber allocations to aboriginal forestry operations. Five years later, little progress has been made - in fact, some First Nation communities report that the situation has worsened, rather than improved - and the negotiation of Sustainable Forest Licenses with the forest industry has proceeded with no apparent regard for MNR's legal obligations under Condition 77.

Other legal obligations created by the Timber Class E.A. decision remain outstanding, such as the implementation of an old growth conservation strategy, development and implementation of a policy for roadless areas, and requirements for improved information and monitoring. Failure to meet some of these obligations has resulted in successful legal challenges of MNR approved timber management plans, and caused MNR to scramble to come into compliance. Other obligations simply remain outstanding, perhaps the subject of future legal investigations.

### **Forest Sustainability?**

With the backdrop of corporate control and crashing timber supplies, what is the picture for Ontario's forests, in terms of ecological health and the forests' ability to sustain themselves and their plant and animal communities? In a word: bleak. Two primary forces are the system of roads demanded by industrial forestry practices, and the forestry practices themselves.

In tandem with their industrial cousins in the mining sector, the forest industry has punched roads through much of the forested landbase. This road system includes tens of thousands of kilometres of roads, criss-crossing most of Ontario's forested lands. For example, in Algonquin Park - a provincial park - there are 2,000 km of road in a 7,600 square kilometre area. Road expansion has gone on to such an extent that there are now only four wilderness areas larger than 1,000 square kilometres outside of the existing parks system south of the 50th parallel. Roads into a forested area result in disruption of wildlife migration patterns, an increase in some predator species, such as cowbirds, and increased edge effect, which is incompatible with some birds and wildlife, and in overfishing of previously remote lakes.

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Despite rhetoric from industry champions found in both the Ministry of Natural Resources and industry itself, the bad old days of harsh forest management practices are still very much with us. In fact, 94% of the annual timber harvest in Ontario is done by clearcutting, an increase from 70% in 1970. Of course, it should be noted that all clearcuts are not the same - some operations will clear the cut block of all standing trees; others will leave a few trees standing as intended seed sources, and some leave scattered patches. This diversity in methods is both a positive and a negative. On the positive side, some of these cutting operations are an improvement over past practices, and may leave the cut area more able to recover and may provide some habitat while it is in the process of doing so. On the negative side, there has been a tendency by some industry advocates to use this variety of clear cutting methods as a defence of all clear cutting, and as cause for dismissing the public concern over this industrial practice. However, the bottom line, from an ecological perspective, is still very much the same. Clear cutting practices generally move a natural forest onto an industrial treadmill, where the forest is cut, then prepared for planting through mechanical scarification (a scraping of the forest floor to expose mineral soil and provide a receptor for artificial regeneration). The area is often sprayed with pesticides before being planted, and is almost certain to be sprayed repeatedly with pesticides after planting to eliminate competition from species other than that planted as the industrial crop.<sup>25</sup> The use of heavy equipment causes compaction and rutting of the forest floor; poor forest management practices can result in erosion, soil loss, and stream and water body siltation

Due to fire suppression and industrial logging, the mix of Ontario's forest is being artificially changed, including the loss of some species such as white and red pine, yellow birch, hemlock and spruce. Logging is resulting in the loss of genetic diversity in some species, even when partial or selection cuts are used; for example, white pine studied in the Algoma area showed a 25% loss in genetic diversity after a shelterwood cut.

Public involvement in forest management decisions is threatened by handing control of public lands over to the private sector. Local citizen committees are in place, but the representation selected by the Ministry of Natural Resources - or the forest industry - is almost always heavily weighted toward user groups rather than public and environmental concerns. Some committees meet only sporadically, and committees are provided with inconsistent access to both the planning process and to the oversight of forest management operations. These handicaps may be difficult to overcome, given that the Ministry of Natural Resources' ability to provide oversight, monitoring and enforcement has been so drastically reduced with the cuts to Ministry staff and budgets

Finally, the impacts of global climate change on the forest estate of Ontario are not yet known, although it can be assumed that forests will be stressed by the accelerated rate of climatic conditions and by severe weather patterns, and those forests already stressed by industrial disturbances and atmospheric contamination may stand little chance of adapting and surviving.

### **The Way Ahead**

The forests' future does not have to be bleak. Choices must be made, but the choices are there. In essence, we can go two routes: the route of the status quo, or the route of the second chance.

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The route of the status quo means more of the same - increasing cut, decreasing jobs, an increasingly more stressed and disturbed forest, fewer opportunities for economic diversity and ever diminishing forest diversity.

The route of the second chance means just that - a second chance at building community stability, at restoring forest health, at achieving sustainability for the human and natural communities. What would it look like? Forest management practices would put the forests first, and profits second, or even a distant third to healthy woods and a full workforce. Decisions would be made for the longer term, with community involvement and scientific support. Local economies would be diversified, with the wild food gatherer, the eco tourist operator and the logger planning for the shared needs of the community and each other. Timber supplies would be tied to local communities, and value added and high value wood products would be the focus of an industrial strategy that was value-based rather than volume-based.

### **Recommendations for the Forest Sector**

1. Establish a process to replace corporately owned Sustainable Forest Licenses with community forest authorities, which plan for a mixed local economy and a mix of forest uses, including recreation, scientific study, tourism, gathering, careful timbering, and responsible mining.
2. Ensure that aboriginal communities and First Nation forestry operations have fair access to both timber resource and resource management decision-making, as required by the Timber Management Environmental Assessment Decision.
3. Implement the recommendations of the Old Growth Forests Policy Advisory Committee. In particular, complete the work to identify and protect representative areas of the full variety of old growth forest ecosystems in Ontario, and implement the forest management recommendations to retain the characteristics of older-aged forest stands in managed areas.
4. Evaluate opportunities for enhanced or intensive forestry to increase production in the already managed forest. Implement this under controlled and monitored conditions, on an area that is less than the area of the forest under a protected status.
5. Limit the use of clear cutting practices to forest stands dominated by those species that have been demonstrated to return to their pre-harvest species composition after clear cutting. Limits should also be placed on the size of the cut, and its configuration should mimic natural contours.
6. Evaluate the use of different cutting practices within each management unit, measuring for their effectiveness in retaining species composition, habitat, plant communities on the forest floor and for natural regeneration. Subsequent work schedules should reflect priorities based on this evaluation.

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7. Limit the use of pesticides in the public forest. In any instance where pesticide is proposed, require a management rationale, including explanation of the choice of cutting method that preceded a regeneration plan that requires the use of a pesticide. This management rationale must be part of a public notice and opportunity for public comment specific to the pesticide application.
8. Create a community fund to assist forest-dependant communities in diversifying their economies and expanding employment opportunities in forest-based and other sectors.
9. Create preferential licensing to companies that make the best use of wood by adding community value such as employment, and to those companies who implement a "local wood, local work" strategy.
10. Develop and implement a working strategy that increases skill levels in the forestry sector, and so improves the potential for higher value and value-added wood products; creates a skilled workforce that supports an increased tourism trade; and improves the communication infrastructure and so increases opportunities for new and non-resources based industries to establish themselves in northern and eastern Ontario.
11. Develop cooperative marketing initiatives for producers of value-added products, and support the establishment of ecological forest certification standards as a way of both protecting the natural asset base and gaining a marketing advantage.

## **ONTARIO UNDERGROUND - MINES AND MINERALS**

### **Introduction to Mining**

Mining and metals are a part of daily life. The benefits of mining in our metal-dependant society are with us in almost every activity - transportation, television, medicine, cosmetics, the list might be endless.

But so too are the impacts of mining and metal processing constantly with us. As metal consumers we are called upon to understand the full chain of impacts that are spawned by our metal consumption, to examine where those impacts can be minimized or avoided, to place our use of metals in the greater context of environmental health, and to demand full stewardship of metals and metal products.

Throughout the mining regions (in Canada, northern Ontario is chief among them) mining has left a dismal legacy of hazardous sites and contaminated ground and surface water. The U.S. Environmental Protection Agency reports that mining has polluted over 180,000 acres of lakes in the United States, and the Canadian Ministry of Northern Development and Mines has estimated that there are six thousand abandoned mine sites in Ontario alone. The Canadian mining industry generates one million tonnes of waste rock and 950,000 tonnes of tailings per day, totaling 650 million tonnes of waste per year.

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While initiatives over the last several years, such as the Whitehorse Mining Initiative, have brought government, industry, labour and First Nations and the environmental community together to develop common goals and strategies to make mining more environmentally responsible, implementation is slow and legislation in some jurisdictions, such as Ontario, is being weakened rather than strengthened.

Mineral extraction moves on a continuum of impact, from initial exploration through invasive exploitation to throwaway consumer products. From beginning to end - and from abandoned mine sites to overflowing landfills - metal extraction, production and consumption pose threats and challenges to the natural world and the human communities who depend upon both the metals they use and the environment in which they live.

Discoveries of precious minerals in northern Ontario at the turn of the twentieth century were unexpected, and the ore was of incredible value.<sup>26</sup> Two-thirds of Ontario and nearly its entire north is covered by the Canadian Shield, which contains some of the world's oldest rock. For much of the 19th century, the Shield has been seen as a useless barrier blocking the expansion of agricultural settlement, an obstacle that lay between southern Ontario and the prairies.<sup>27</sup> Two of the first discoveries of major deposits: copper-nickel ore at Sudbury in 1883, and silver at Cobalt in 1903 were both made accidentally by railway blacksmiths, who were forging the way west or north for agricultural settlement. Ontario continues to have the largest metal mining sector of all the provinces in Canada, and accounts for one-third of Canadian mineral production.<sup>28</sup> Ontario's mining industry generates \$5 to 7 billion each year (including aggregate materials), primarily through exports, with nickel, gold and copper generating the greatest value. Approximately 18,800 people are employed directly in Ontario's mines and associated smelters and refineries.<sup>29</sup> Currently, there are 41 metal mines operating in Ontario with another 16 in the stages of advanced exploration.<sup>30</sup> By contrast, over 6,000 inactive or abandoned exploration or mining sites litter the province. These sites range from moderate to extreme in terms of the safety and environmental hazards they pose, but neither industry nor government has action plans or designated funds for their remediation.<sup>31</sup>

Mining is heavily dependent on outside capital and external markets. Historically, mining in northern Ontario was difficult, given that the markets, labour, capital, technology and cheap transportation needed for the profitable operation were all found further south.<sup>32</sup> Mining created a sparse and scattered population across the Shield in Ontario, where many communities were almost entirely dependent on the extraction and processing of ore - an unsustainable resource use, resulting in unsustainable communities. Controlled by single industries, which were often headquartered in distant urban centres, these communities have been, as one researcher described it, "subject to crucial decisions made in distant corporate offices that were insulated from the devastating local impact of these decisions."<sup>33</sup>

Perhaps at least in part because mining communities in northern Ontario are so often heavily dependent on a single resource industry, and because communities lack control in crucial decisions made in the industry, mining operations have generally not been widely subject to public scrutiny. Particularly when compared to the steady increases in both public scrutiny and public literacy around forest management, the mineral extraction sector has escaped the public gaze virtually unnoticed. But increased public

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review of mining activities is badly needed, and public attention is essential to efforts to improve mine practices from beginning to end of the mining sequence.

## **Six Stages of Mining and Related Environmental Concerns**

### **1) Preliminary Exploration**

Geochemical and/or geophysical techniques used to identify valuable ore bodies. Ground-work, such as stripping or trenching to remove overburden and/or drilling are used to obtain samples. Potential impacts: camp garbage; erosion from trenching, stripping, trails and roads; contamination of watercourses; increased access to fish and game animals from trail and roads; land alienation from other land uses; disturbance to critical habitat.

### **2) Advanced Exploration and Development**

Further exploration and feasibility studies examine profitability, design of the mine site is planned, and construction begins, e.g., shaft sinking, pit excavation, road building, construction of surface facilities. Potential for environmental impact is similar to that of an operating mining, but activities are less regulated.

### **3) Mineral Extraction**

Ore is removed from the ground. Waste rock is discarded and the remaining rock is transported to a mill. Ore can be extracted from open pits, from underground, or through heap leaching. Potential impacts: surface disturbance and loss of wildlife habitat; waste generation; waste rock piles may leach metals and/or acid; "mine water" may affect turbidity, sedimentation, and toxicity of watercourses; spread of particulate matter to atmosphere and hydrosphere; changes in local water balance; heap leaching may leak toxic chemicals, e.g., cyanide.

### **4) Concentration / Beneficiation**

The ore is crushed and ground at the mill. This is followed by separation of valuable material from waste (tailings) using gravity, magnetic, or flotation techniques. Potential impacts: enormous amounts of tailings are generated; tailings may leach metals and/or acid; process is both energy and water intensive; reagents used in the flotation process may be toxic.

### **5) Further Processing**

Further metallurgical processing, such as smelting, and refining, is carried out, which may be done further off-site. This stage usually involves changes in the chemical nature of mined minerals. Potential impacts: generation of solid waste, e.g., slag; process is both energy and water intensive; production of sulphur compounds from sulphide ores, e.g., sulphur dioxide emissions to air; processing involves potentially toxic chemical wastes, e.g., sulphuric acid, ammonia.

### **6) Reclamation / Decommissioning**

The area disturbed by mining is purportedly returned to its original state or to a productive alternative. Most often the area is reclaimed by constructing ponds, wetlands, grassland or forest over the mine site

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and impoundments of waste. Surface and ground water monitoring must continue. Concerns: need for indefinite care of any potentially acid generating waste; leaching of hazardous waste not properly disposed of; safety hazards, e.g., if underground openings are not closed or properly supported; funding for reclamation may be completely lacking if credit has not been secured during mine operation.

### **Acid Mine Drainage: A Perpetual Liability**

Perhaps mining's most remarkable - and least attractive - feature is the industry's incredibly high volume of waste production: waste in the form of rock, or rock that has been finely crushed during milling to create a new waste product called tailings.

Most base and precious metals are found in ore bodies at concentrations of only a few percent, even tenths of a percent, of the rock's total make-up. A typical Canadian metal mine rejects 42% of total mined material as waste rock, 52% as tailings, and 4% as slag. The remaining 2% comprises the values for which the ore was mined.<sup>34</sup> As a result, the Canadian mining industry generates 650 million tonnes of waste per year. To put this number in perspective, simply consider that this is more than 20 times the amount of solid waste generated each year in Canada by all residences, other industries, commercial establishments and institutions combined.<sup>35</sup> An incredible volume of these wastes is generated in Ontario, which accounts for one-third of Canadian mineral production.

In addition to the problems created by having to manage the sheer volume of waste tonnage, the situation is further complicated by the presence of acid-generating elements in the ore. Most Canadian base metal, precious metal, and uranium mines work with rock that contains metal sulphide mineralization.<sup>36</sup> The waste from this type of rock is chemically reactive. When the rock is crushed, and exposed to oxygen and water, it begins to oxidize, producing sulphuric acid. The acid further dissolves

#### **Kam Kotia Tailings: A Case Study in Acid Mine Drainage**

The Kam Kotia Mine, located 15 km northwest of the city centre of Timmins, was originally operated as the Wartime Metal Corporation from 1942 until 1961. In 1961, the property was acquired by Kam Kotia Mines Ltd., principally owned by Robison Mines Ltd., and was operated until 1972. The mine has been abandoned, and efforts to have past owners reclaim the site have met with responses of bankruptcy and ceasing of corporate status.

The site includes a partially filled open pit, old mill remnants, 200,000 tonnes of waste rock, and over 400 hectares containing 6 million tonnes of impounded and unimpounded tailings. The Kam Kotia mine tailings are reported to have the highest tailings sulphide concentration in Canada and are strongly acid generating. Surface water runoff from the site is very acidic at pH 1.8 - 2.5, and contains elevated arsenic, zinc and copper. Highly acidic runoff carrying large loads of metal pollutants has been occurring since abandonment.

The site lies on the watershed divide between the Little Kamiskotia River to the south and the Kamiskotia River to the north. The Kamiskotia Creek discharges into Kamiskotia River several kilometers away, where metal concentrations are still elevated. It has been estimated that about 35,000 tonnes of tailings are currently clogging the Kamiskotia creek bed, much of which is flushed out and replenished on an annual cycle. The canoe route along the Kamiskotia River has been altered to avoid the site. The Little Kamiskotia River to the south has been severely impaired along its entire course. The cost of rehabilitating the site is estimated between \$12 and \$20 million, but there is no funding available for cleanup.

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metals in the rock, mobilizing heavy metals and creating acidic drainage containing potentially toxic metals. This phenomenon is known as acid mine drainage; it is the mining industry's greatest environmental liability. Federal estimates of cleanup costs for acid mine drainage at existing mines are between \$2 billion and \$5 billion.<sup>37</sup>

The process of acid generation in waste may not start for decades or more after the rock is first exposed.<sup>38</sup> But, once started, acid mine drainage persists for hundreds, even thousands of years;<sup>39</sup> there is great uncertainty around predicting rates of acid generation and time to exhaustion.

Most commonly, acid mine drainage is treated by neutralizing it with a buffering substance, such as lime. However, this treatment is expensive in the long term and produces hazardous precipitate or sludge that is then difficult to store and dispose of.<sup>40</sup> Maintaining potentially acid generating waste under water limits oxidation and is the most common method for preventing acid mine drainage. But there are downsides to this treatment as well: flooded piles of waste in contained waste impoundments require ongoing monitoring and maintenance, and the risk that the tailings impoundments will collapse is a constant concern. Canadian companies operating abroad have been responsible for notorious failures of tailings management in recent years, including the Omai spill in Guyana in 1995, the Marcopper Mine in the Philippines in 1996, and, more recently, the Boliden Mine in Spain in April 1998.

### **Mining in Action: Environmental Standards**

The primary tool for regulating the environmental performance of a mine during its operating lifetime is through standards set for the water quality of the mine effluent. Discharge of process water and stormwater runoff at mines is controlled provincially by the Municipal Industrial Strategy for Abatement (MISA) Metal Mining Sector Monitoring and Effluent Regulation under the *Environmental Protection Act*.

Under current regulations, industry is required to meet numerical concentration limits and also ensure, through toxicity testing, that effluents are non-lethal to rainbow trout and *Daphnia magna* (a water-flea). However, non-lethal in the technical or regulatory sense is not what most members of the public would assume. For a mine's water sample to pass an acute lethality test, half of the group of fish or fleas used in the test must survive; conversely, 49% can die, and the effluent still passes that single test. At present, there are no standards in place to require that effluent not produce conditions that have chronic or sub-lethal effects on the health of humans or wildlife species.

On average, one of every four mines either failed toxicity tests or had a temporary exemption from MISA regulations for the winter of 1997 and the spring/summer of 1998.<sup>41</sup> Perhaps in response to this failure, some industry organizations are proposing that toxicity monitoring under MISA remain as a legal requirement, but that "non-lethal effluents be identified as an objective under the regulation rather than a compliance requirement."<sup>42</sup> In industry's view, MISA should be harmonized with federal regulations, which are currently being updated and "likely will not require a non-lethal effluent." Government and public interest groups participating in that federal review take a different view on this question, and are committed to maintaining the requirement that all effluent be non-acutely lethal to

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meet provincial standards, and to seeing that the federal regulation is amended to set the same standard.

The provincial regulation of mining in Ontario has been weakened in recent years, despite the evidence that an absence of strong regulation creates a legacy of environmental damage. For example, in 1995, the Ministry of Environment and Energy amended the MISA regulation to "clarify" the non-application of the regulation to closed mine sites.<sup>43</sup> This means that effluent regulations do not apply to multitudes of closed mine sites, but only to the 41 mines that are currently operating.

### **Mining Exploration and Land Use**

The mining industry wants open access to the entire land base for exploration - public lands, private lands, and protected lands. Industry's argument is that only one prospective mining site in 5,000 actually produces profitably,<sup>44</sup> so the maximum land base is needed to find the rare and valuable deposits. Of course, the flip side of this logic is that of the 5,000 sites that have been disturbed through mineral exploration, 4,999 have experienced those losses to ecological integrity and habitat for no economic or social benefit other than those accrued through the financial games of the venture capital market.

During prospecting and exploration, the degree of environmental impacts can vary greatly, and in many cases they may be minimal. However, exploration activities are also less regulated than in later stages of mineral development, and they generally lack any requirement for rehabilitation of the site. And while impacts may be less severe, the site disturbance can also be extreme, including the complete removal of the vegetation and so total loss of ecological function.

In preliminary exploration, areas of mineral potential may initially be identified using airborne survey techniques that require no intrusion into an area. But after a mineral claim has been staked, more detailed - and more intrusive - work begins on the

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#### **Exploring Ontario's Old Growth Forests**

Temagami, land of majestic pines and deep water, is known for its old-growth forests, ancient trail system, interconnected canoe routes, wilderness and lake trout habitat. But not even Temagami's wilderness renown or natural majesty can protect it from the clawing curiosity of mineral exploration.

In June 1996, the government rejected recommendations of the Temagami Comprehensive Planning Council that sensitive wetlands in the headwaters of the Lady Evelyn River System be protected from mining activities. An area of 617,500 hectares was made available for claim staking, lifting a 24-year-old mining ban in the area. The day the land cautions were lifted, about 600 prospectors rushed in, staking thousands of claims in the Temagami wilderness. While a new provision in the *Mining Act* allows for special standards for claim staking in designated sensitive habitat, to date only skyline reserve of Lake Temagami has received this special consideration, limited as it is.

The Wolf Lake Old Growth Red Pine area contains the largest concentration of old growth red pine in North America. Located just south of Temagami, the stand has a remarkable density of red pine, as well as a surprising amount of natural red pine regeneration. However, the area has been under mineral exploration for almost a decade, politically blocking the possibility of having the area designated for protection. Under the revised *Public Lands Act*, exploration can continue without even the limited constraints that were previously possible through the permitting process.



ground to assess the actual mineral potential. Areas can be stripped of all soil and vegetative cover to obtain a rock sample, or diamond drills may be used to obtain core samples from below surface. Impacts come not just from the actual disturbance to the site where the sample is being taken, but from the infrastructure created and used to support the exploration and development crew, including camps and their domestic waste, trails and roads, and - eventually - energy and communication systems. Potential impacts include the erosion from trenching, stripping, trails and roads; creation of waste rock piles; contamination of watercourses; increased access to fish and game animals; land alienation from other land uses; and disturbance to critical habitat. In advanced exploration and development projects, actual construction begins, with shaft sinking, pit excavation, road building, and construction of surface facilities, with the same potential for environmental impact as with an operating mine, but with less review and regulation.

Public concerns, values and other land uses often conflict with these activities. Trap lines, ski trails, sensitive natural areas such as old growth forests or special wildlife habitat - all are vulnerable to the paramount "rights" of mineral exploration. And the dividing lines between prospecting, exploration and an operating mine are faint ones, with more advanced exploration including sinking of mine shafts and actual ore production, but still lacking the public scrutiny and approval process that even the most limited timbering operations on public land would require.

In 1996, preliminary mineral exploration on public lands was deregulated under the Bill 26 amendments to the *Public Lands Act*. Work permits for preliminary exploration on public lands are now only required when roads or buildings are being constructed, while impacts on ground and surface water may require authorization either provincially and/or federally. Clearing, mechanical stripping, bulk sampling, drilling and blasting, moving heavy equipment and drilling rigs, and building trails are allowed on public land without need for permits.<sup>45</sup>

Furthermore, there is no requirement to reclaim disturbances caused by these activities, except for human safety hazards.

During the Lands for Life land use planning process in 1997 and 1998, the mining industry was the fiercest opponent to establishing the additional protected areas needed to complete Ontario's parks system and have adequate representation of Ontario's natural diversity and ecological regions. Instead, prospectors associations and major mining companies teamed up to agitate for not only no expansion of the existing protected areas system, but for the opening up of Ontario's parks and conservation reserves to mineral exploration. Frequently joining up with their forest industry counterparts, industry spokespersons dominated public meetings in northern Ontario, often creating threatening environments for those who might express different views, and consistently ensuring that the land use debates were focussed on industry's claims to the entire land base, rather than the public's interest in seeing the range of values accommodated, with an assurance that wild areas would remain wild for future generations.

### **Abandoned Mines**

There are more than 6,000 inactive or abandoned exploration or mining sites in Ontario, ranging from

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highly contaminated sites with large volumes of tailings to small exploration projects that pose relatively little hazard.<sup>46</sup> Also extremely varied, however, is the amount of information known about the site, and the degree of action taken since hazards were first assessed in the early 1990's. At least one-third of the sites have fallen back into public ownership due to corporate default, land forfeiture, etc.<sup>47</sup> The overall cost for cleaning up these sites is estimated at \$3 billion,<sup>48</sup> much of which will have to come from the public purse. At the moment, no cleanup is scheduled; costs to the province will only escalate over time as environmental damages increase, and - potentially - even more companies go bankrupt or cease corporate status.

Since the 1930's a large number of mines have closed down, leaving their tailings disposal facilities unattended, and often unremediated. The level of engineering design and construction effort that goes into tailings disposal areas has risen considerably since the 1960's. In the early 1990's changes to Ontario's mining legislation made it a requirement that companies develop and implement closure plans to address the growing problems associated with abandoned mines and mine hazards.

Inspired by the collapse of a tailings dam on an inactive mining property near

Matachewan in October 1990, the provincial government began a program to inventory abandoned

#### **Deloro: The Devastated Orphan of Industry**

Ontario's first gold rush was in the 1860s. Native gold and arsenopyrite were found where the southern edge of the Canadian Shield intersects with the Great Lakes Lowlands. At the town of Deloro gold was soon scarce, but arsenic, a by-product of roasting the ore, was produced from 1873 to 1961 for use in pesticides. Other metals, including copper, silver, cobalt and uranium, were shipped as ore from around the world for processing and refining at Deloro.

The mine site, now the most contaminated land in the province, was abandoned in the 1960s, leaving many hazards, including tailings that were both acid generating and radioactive. The tailings lie along the Moira River.

People died at Deloro from arsenic poisoning in well water in the 1930's. Now a town of 180 people - where once there were several thousand residents - remains with health concerns, including concerns related to high rates of cancer, and lowered property values. The original owner, Erickson Construction, has declared bankruptcy after a history of operating at a profit.

The Ontario government adopted responsibility for the site in 1979. To date, government has spent about \$10 million in initial cleanup. Maintaining the water treatment plant at Deloro costs between \$250,000 to \$400,000 per year, and treatment must continue for an indefinite period. The treatment produces a hazardous sludge, which accumulates and must be disposed of periodically at a cost of \$500,000. The Moira River now discharges about 2,300 grams of arsenic per day into the Bay of Quinte on Lake Ontario, compared to the Trent River, a bigger system, that discharges only 13 grams per day into the Bay, 15 km west of the Moira River. An extensive monitoring program remains in place, while costs to do further serious clean-up are estimated to be at least \$15 million.

mines and evaluate them for the likelihood of sudden failure of tailings containment structures and its probable consequences for public safety and to the environment.<sup>49</sup> The Matachewan spill resulted in the wash-out of a section of highway and the release of 100,000 cubic metres of tailings into the Montreal River, threatening the water supply of several downstream communities.

Funding was made available through the Ministry of Northern Development and Mines for completing an inventory of abandoned mines between 1991 and 1994. Approximately \$8 million was spent constructing a database and hiring consultants to conduct site visits, to assess hazards, and determine short and long term reclamation costs.<sup>50</sup>

Since the evaluation used a criteria of known sites of 10,000 tonnes or larger, only 127 sites were including in the evaluation. Those sites were evaluated on the basis of the stability of the tailings deposit, the downstream hazards or risk to public safety and environmental impact, and the contaminant potential of the tailings. The initial evaluation identified 25 high priority sites.<sup>51</sup> Unfortunately, funding was cut before the follow-up evaluation work was completed and before reclamation work was begun on most sites. Currently, no funding is allocated and government money is only made available in an emergency.<sup>52</sup>

### **Mine Closure and Reclamation**

The legacy of abandoned and unattended mine sites and mine tailings comes, as government and industry will often rush to explain, as a result of past mistakes, from earlier eras when regulations were not as strict or not in place at all.

Since mine reclamation costs are typically incurred after a property ceases to produce, they come at a stage when the property is a liability and has a negative market value.<sup>53</sup> Therefore, any provision for mine reclamation must be made at the front end, when the mine is making money rather than costing money, and when planning can be done to ensure the most effective closeout. Amendments were made to the *Mining Act* in 1990 to ensure that the province did not end up bearing the cost of additional contaminated land and water resulting from abandoned mines - amendments that required owners of operating mines to file detailed closure plans for government review, and for them to post realizable financial security for covering the costs of closure.

However, these requirements were relaxed in 1996, with the amendments to the Mining Act included in Bill 26, an Omnibus Bill introduced by the Harris government in the first year of their term. While not removed entirely, the requirements for closure plans were weakened by removing the need for government review, and the posting of financial securities to cover closure costs was made discretionary, with the option introduced of companies simply passing a financial means test as a proxy for posting actual financial assurances.

The regulatory objectives for mine reclamation in Ontario are to establish the physical and chemical stability of the mine site, and to have the former mine site restored to a productive after-use that is compatible with surrounding lands. While the guidelines include language about returning the site to its

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natural state, this objective is given a broad interpretation.<sup>54</sup> Reclamation activities and tools include shaft capping, rehabilitation of pit faces, ensuring crown pillar stability in mine workings, safely disposing of all waste, maintaining stability of tailings impoundments, revegetation of disturbed land, and groundwater and surface water effluent monitoring and treatment. All of these contribute to the long-term stability of the site.<sup>55</sup> Effective planning for mine closure means that environmental design is incorporated into a project from the start, with site design and controls taking into account the final needs for site closure even before the initial construction has begun. Closure plans are required under the *Mining Act* for existing mines, as well as for advanced exploration projects and mines beginning operation.

Legislation around planning for mine closure was drastically weakened in 1996 by Bill 26, the *Government Savings and Restructuring Act*, which included amendments to the *Mining Act*.<sup>56</sup> Three major changes in the legislation were: 1) reduced requirements for government participation in planning mine closure, including removal of the requirement for government review of closure plans; 2) relaxation of legislation around financial assurance for closure; and 3) the opportunity for mine companies to obtain an exit ticket that allows companies to return mine properties to public ownership, effectively exempting them from any future environmental liabilities, even if they arise as a result of the companies' actions or inactions.

The reduced role of the Ministry of Northern Development and Mines in the process of certifying closure plans means that senior officers in a mining company will now file mine closure plans, which - instead of being reviewed by Ministry staff - will require a professional engineer's stamp of approval.<sup>57</sup> The role of government is now simply to audit, checking that items have been addressed, and to accept the plan as filed.

Under the new regime of self-assurance, it is no longer necessary for mining companies to post realizable financial securities in all instances. Instead, companies can pass a financial means test, exempting them from the financial requirements. Posting realizable financial securities for closure means setting aside credit for covering the costs of reclamation. In contrast, self-assurance (at least in the financial lingo of the Harris government) involves simply passing a means test based on past and present performance, without providing any credit. At the same time, information about financial assurance for mine closures provided by mining companies has been exempted from freedom of information requests.<sup>58</sup>

A study commissioned by the Ministry of Northern Development and Mines on self-financial assurance for closure plans identified a number of flaws in the concept of self-assurance, and concluded that "the risk associated with granting self assurance privileges to a mining company is considerable as the Ministry will be effectively assuming the status of an unsecured creditor throughout the life of a project." It went on to comment that the "assessment criteria proposed ... imply the assumption that historical performance is an indicator of future financial strength. This assumption can easily lead to inappropriate conclusions." The study examined the effectiveness of the financial tests for assessing the financial health of 20 mining companies and concluded there was "little consistency in the tests passed or failed between companies and between periods."<sup>59</sup> Three years after the passing of Bill 26, the

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Ministry of Northern Development and Mines continued to struggle with how to implement the self-assurance provisions of the changes to the *Mining Act*, caught between the politics and practicalities of managing the future risk from the country's largest mining sector.

Also under the Bill 26 amendments, requirements for the delivery to the Ministry of annual reports on the implementation of reclamation by mining companies were removed, reducing by one more means the level of scrutiny and monitoring afforded mining operations in Ontario<sup>60</sup>

Perhaps as a final blow, changes to legislation under Bill 26 mean the *Mining Act* now allows companies to apply for an exit ticket, effectively exiting from any long-term corporate responsibility for the lands, which they have wrung such great profit from. Practically, it means that companies pay on their way out the door an estimate of the costs of site maintenance into perpetuity. If the financing turns out to be inadequate, government will pick up the rest of the tab, or the property will be left unattended. The same study commissioned to look at replacing financial assurances with a financial means test was asked to develop an effective method for determination of exit ticket payments. The study concluded: "The calculation of the value of an 'exit ticket' involves determining the present value of future cash outflows... the likelihood that the value of the 'exit ticket' will equal the actual cost outlay for ongoing maintenance costs is very remote."<sup>61</sup>

In 1995, the budget of the Ministry of Northern Development and Mines' Mine Rehabilitation Branch was reduced by \$1.3 million per year for 1996 to 1997 and fourteen staff members were laid off,<sup>62</sup> radically decreasing the level of monitoring and technical capacity in government. Only two inspectors remain to oversee all mine reclamation in northern Ontario. The operating budget for 1996 to 1997 was \$900,000, a minuscule amount considering costs for mine reclamation in the province or the mining revenues generated. In contrast, a mining tax freeze was accommodated in the 1996 budget, which froze hydro rates and all mining taxes and *Mining Act* related fees and licenses.<sup>63</sup> The mining land tax on mining properties was frozen in 1996, and mining lease rental rates reduced in 1998.

Taken as a package, what do these changes mean? Reduced technical capacity and control on the part of the public service are only the beginning, albeit perhaps one of the most important aspects of the changing regulatory regime. From a company perspective, it can only mean reduced costs and reduced accountability, but also less consistency, less predictability, and certainly less commonality in terms of operating standards. For the public, it means increased risk, decreased access to information about company operations, and vanishing confidence in the ability of government to govern in the public interest.

## **The Global Marketplace**

A recent industry paper on mining in protected areas<sup>64</sup> opens by extolling the wealth of mineral deposits in Ontario and then threatening that if exploration and mining are discouraged here, they will simply be done elsewhere, and Ontario will lose the advantages of the resulting wealth creation." The proclamation is typical of industry's continuous efforts to bargain for lower regulatory standards.

The globalization of investment and increased capital mobility has affected all the major mining nations, including Australia, the US and South Africa.<sup>65</sup> Mining is a highly cyclical industry, and the level of mining investment is much more strongly related to the prices of minerals than to rigorous regulations.<sup>66</sup> For example, the 1997 downturn in the price of gold is reported to have threatened the economic feasibility of 40% of the world's gold mines.<sup>67</sup>

Mining involves speculation. Regional exploration and development rushes dominate this sector's activities. The globalization of investment has led to a mining rush in nations where reserves are comparatively untapped. However, Canada has consistently ranked among the top three destinations of mineral exploration investment for the last 25 years.<sup>68</sup> Canadian tax and security laws make it relatively easy to finance high-risk mining ventures, and Canadian firms undertake nearly 30% of world mineral exploration - more than any other country.<sup>69</sup>

As a leader in mining, Canada has an obligation to enforce high standards and strive for best practices. Government regulation should be viewed as a driver of innovation and efficiency, and a foundation for consistent, fair and open decision making.<sup>70</sup> The international operations of Canadian companies abroad must be monitored and held to the same standards. Canadian mining companies have been implicated in major toxic spills around the world,<sup>71</sup> e.g., tailings spills over huge areas in the Philippines, Guyana, and Spain, and - more recently - a large cyanide spill in the former Soviet Republic of Kyrgyzstan.

Mining activities can cause chaos in communities. A new mine may mean immigration and expansion over the short term, followed by unemployment, emigration and potentially high costs of environmental clean up and/or monitoring when mine reserves are exhausted. Globalization means industry is more international and more transient, but it also presents an opportunity and challenge for communities around the world to share social and environmental concerns around multinational mining companies and projects. Communities can be united in a desire for fair trade that places community needs first and company needs second.<sup>72</sup>

## **The Public Role**

Public monitoring and participation in mining regulation has historically been extremely limited. The mining industry is accustomed to operating with little public scrutiny and with full access to public lands, and full opportunity to exploit public resources.

But public involvement in overseeing mine operations is vital, so much so that emerging thought in civil society is that, as a condition of permit approval, a public oversight committee should be part of monitoring mine operations. Some companies are beginning to engage in this type of proactive liaison,

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out in Ontario public participation is still minimal.

Provincially, mining permits are issued through the *Mining Act* and approvals regarding impacts on public lands and water are issued through the *Environmental Protection Act* and the *Ontario Water Resources Act*. Public

participation is provided for under these Acts by the Environmental Bill of Rights (EBR), where notification of proposals is posted on an electronic registry for 30 days.<sup>73</sup> Public comments received during this period must be taken into account, but there is no actual requirement to respond or to act on them. Further, most of the notices posted on the EBR electronic registry contain only minimal information, and often include incomplete or incorrect contact information, further constraining the public's ability to get sound information or make effective comments on a project.

#### **Guidelines for a Responsible Mine**

Adapted from the Mineral Policy Center, Washington, D.C.

**Local citizen oversight committee:** establish a public committee at all major mines as a condition of permit approval;

**Secure funding:** guarantee finances for environmental technology and for mine closure;

**Planning reports:** submit reports for design and closure of the mine and make them available to the public before operations begin;

**Environmental CEO:** hire a chief executive officer to work with the environmental department of the company; demonstrate willingness to make changes to the project that can reflect the concerns of the public;

**Treatment of discharge:** ensure discharge from the mine site is treated so that it is safe for aquatic organisms, as well as people;

**Leak monitoring:** install back-up liners or pipes and a leak detection system for leaching pads, tailings impoundments, and throughout the liquid transfer system; install monitoring wells in the groundwater with frequent testing;

**Surface water control:** divert watercourses and surface water runoff around the mine site; prevent siltation of waterways;

**Rainfall management:** divert stormwater from causing overflow of toxic solutions into watercourses;

**Wildlife protection:** prevent wildlife access to toxic sources;

**Reclamation and landscaping:** reclaim solid waste impoundments so that acid drainage and metal leaching does not occur;

**Long term monitoring:** plan monitoring programs for mine sites after closure, which include publicly reported surface and groundwater testing, and a plan for corrective action if acid or toxic leakage develops.

Given the large ecological footprint and the long-lasting effects of most modern mines, it would seem reasonable to expect a comprehensive environmental assessment prior to approval. An environmental assessment would include public consultation, involve affected communities, and examine the project in terms of purpose, impacts, mitigation measures, alternatives, and contingency plans. Under present legislation, Ontario's *Environmental Assessment Act* applies only to public projects unless specifically designated by cabinet. Under federal law, the *Canadian Environmental Assessment Act* applies only to large mines (i.e., 3,000 tonnes per day of ore for base metal mines)<sup>74</sup> and in most cases requires a

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comprehensive study, but not an environmental hearing. While public participation in comprehensive studies is mandatory, the public notice and information mechanisms are sufficiently weak that in some recent cases in northeastern Ontario the neighbours to a proposed mine were not even made aware that the single open house held by the company was part of a federal environmental assessment.

## **The Way Ahead**

In the mineral sector, decisions about mineral development must be brought into the realm of public influence; to borrow from the trade tables, there should be a level playing field among the various interests on crown land, and mining should no longer rule supreme. Mining activities should be regulated in an open and transparent fashion, with a high standard of care demanded for the lands and the waters that mining activities affect. This means no discharge of toxic effluent, no net loss of habitat, and the reclamation of mine sites. This means the "right to mine" claimed by industry and granted by government for the last century must be reconsidered within a reasonable array of rights - rights to a healthy environment, rights of the natural environment, and rights to clean air, water and land.

Minerals are durable and can be effectively recycled. Gains can be made through reduction in consumption, eco-efficient extraction, production and design, and maximizing rates of metals recovery and reuse. Ultimately, we must examine the role that minerals and the mineral development industry should play in a sustainable economy and society.

## **Recommendations for the Mineral Sector**

2. Increase community education around mining. Involve communities in reviewing plans for mine design and closure through an environmental assessment process that is mandatory for all mines. Establish a local citizen oversight committee at all major mines as a condition of permit approval.
3. Complete the inventory and site assessments of abandoned mines. Provide adequate funding (e.g., unfreeze and increase mining taxes) to begin reclaiming high priority sites. Identify companies owning inactive mines and require them to complete mine closure at their expense.
4. Increase government technical capacity for mine review (e.g. of closure plans) and inspection and regulatory capacity for enforcement.
5. Enforce a schedule for compliance for mines to meet discharge requirements, including toxicity testing. Design and apply regulations that address effluent discharge at inactive, abandoned and closed mine sites.
6. Design a permit process for preliminary exploration that involves requirements to reclaim the area disturbed. The process should include public notice and comment, and public involvement and environmental baseline studies in areas of concern.
7. Commit to protected areas established as parks, conservation areas, and public land that contain rare

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or sensitive habitat. In these areas, mineral exploration and development should be prohibited.

8. Secure financial credit from the mine proponent for covering the costs of mine closure in the event of corporate default, and ensure that the mine proponent remains liable for damages caused over both the short and long term.
9. Provide funding for research into best practices around mining and the environment. In particular, fund research in mine waste management and preventing and treating acid mine tailings.
10. Ensure that environmental standards of Canadian mining companies are enforced both within Canada and internationally.
11. Design full cost accounting (economic, social, environmental and externalities) of all direct and indirect public subsidies over the full life of mines. Use and reuse minerals more efficiently.

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**HUMAN SETTLEMENTS:  
SUSTAINABLE LAND USE AND TRANSPORTATION**

By Ray Tomalty and Francis Paul

Prepared for

The Environmental Agenda for Ontario Project

March 1999





## Summary

### Current Status

The challenges involved in building sustainable communities in Ontario vary according to the location of the community in the province and the settlement's size and history. However, the most serious challenges are being generated through suburban growth outside of Ontario's major cities and towns.

Sprawling, low-density suburban development makes the provision of public transit and the use of non-motorized forms of transportation very difficult. Therefore, it is not surprising that the low-density suburb and the automobile are mutually depending and reinforcing technologies that have serious cumulative environmental consequences, including:

- unsustainable energy consumption and greenhouse gas production;
- unprecedented land consumption;
- destruction of farmland and farm economies;
- an increasing dependency of peripheral suburban communities on septic systems;
- destruction of wetlands, natural meadows, and wooded areas;
- increased production of unnecessary waste;
- an increasing use of non-renewable aggregate resources;
- a dependency on the automobile;
- reduced economic efficiency; and
- failure to understand changing social realities that point towards a shift in housing choices.

### Causes of the Problem

The causes of sprawl are intertwined and complicated but a number of key contributing factors include:

- ineffective municipal planning;
- public resistance to high density living;
- lack of regional coordination;
- biased infrastructure financing policies;
- hidden car subsidies;
- lack of integration between land-use and transportation planning;
- inefficient building and development standards; and
- a piece-meal approach to land-use decisions.

### Agenda for Change

Since the publication of Jane Jacob's *The Death and Life of Great American Cities* in 1961, a seminal publication on the need to re-think post World War II planning in our cities, there has been an emerging consensus in many planning, policy and advocacy circles that cities must pursue a more compact urban form. This visionary consensus of a more compact urban form is

comprised of two inter-linked aspects: a densely populated, mixed-use urban form coupled with a sustainable transportation system.

There are a number of environmental, social and economic advantages for adopting an agenda for change that embraces a compact urban form. More densely settled cities are more conducive to the installation of environmentally friendly infrastructure, i.e., co-generation and district heating, and a more cost-effective blue-box system. Higher densities are also cheaper to build. According to one study, a more compact development in the neo-traditional design would cost 8.8% less per unit than one in a conventional plan. Other studies have found that in high-density areas, energy consumption from auto transport, space heating and cooling requirements are more than 40% lower than in low-density suburban developments. There is also mounting evidence that more compact and diverse communities respond better to changing social and economic conditions.

### **Key Recommendations**

Governments interested in advancing the vision of compact, environmentally-friendly urban form need to create policies that:

- improve regional growth management;
- enhance public involvement in growth management decisions;
- adopt permanent urban boundaries;
- implement alternative development standards;
- champion mixed-use development;
- promote intensification and transit-supportive land use;
- adopt ecosystem planning principles;
- create an ecological/agricultural land reserve;
- retrofit existing suburban developments;
- ensure that aggregate development is sustainably extracted;
- move to unit value or land value taxation; and
- adopt a marginal cost approach to development charges.

Governments interested in a sustainable urban transportation system need to create policies that:

- are part of a comprehensive transportation planning framework;
- reduce the need for new road capacity;
- improve the attractiveness of non-motorized transportation;
- eliminate automobile subsidies;
- increase transit subsidies;
- make public transit more attractive to users; and
- promote trip reductions.

We also recommend that the provincial government re-assess its decision to remove itself from local planning matters. We strongly recommend that the province reassert itself as a guardian of

sustainable development by adopting stronger provincial planning policies, monitoring and enforcing municipal planning decisions, and by placing greater controls on private developments.



#### Authors:

Ray Tomalty is a consultant in urban environmental issues, growth management, and municipal fiscal instruments. He teaches part-time in the Environmental Studies Programme at the University of Toronto and in the School of Urban Planning at McGill University. He is also Associate Editor of *Alternatives Journal*, Canada's oldest environmental policy journal, and Editor of the New Urban Agenda, an on-line journal published by Peck & Associates.

Francis Paul is completing his undergraduate degree at the University of Toronto while also taking a number of science courses at the University of Guelph. He has a special interest in urban ecological issues and was a Canadian non-governmental representative at Habitat II: the United Nations Conference on Human Settlement in Istanbul in 1996. He has worked with the Canadian Environmental Network, the Ontario Environment Network, the Evergreen Foundation and a number of Ontario Public Interest Research Groups (OPIRGs).

#### Acknowledgments:

For reviewing a draft version of this chapter and providing useful suggestions, the authors would like to thank John Bacher, Margaret Casey, Kathy Cooper, Jacinda Fairholm, Karen Gventer, Alan Marshall, Mike Nickerson, Ron Nielsen, Linda Pim, Helen Purdy, Jason Thorne, Lynda Walters, Elizabeth Wharton, and Mark Winfield.



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## **HUMAN SETTLEMENTS: SUSTAINABLE LAND USE AND TRANSPORTATION**

### **INTRODUCTION**

When we talk about environmental issues, we are usually talking about the ways human beings interact with and impact upon natural systems. This interaction takes place through a number of technologies, such as mining, agricultural and industrial technologies. As environmentalists, we pay close attention to how these technologies are designed and deployed and we advocate ways to minimize human impacts on nature. One very important technology mediating our relationship with nature – and one that is sometimes overlooked – is the city or town. Human settlements are the largest, most complicated technology ever created by human beings.

Cities and towns are where most of us live; almost 80 percent of Canadians now live in settlements of over 5,000 people. Urban areas are, therefore, where environmental problems are most severe. Because this is where most products and services are produced and consumed, this is where most industrial pollution and wastes are created. Because most cars and other vehicles are owned and used by urban dwellers, this is where a large part of the air pollutants and greenhouse gases originate. The way cities grow and function has a huge impact on local, regional and global ecosystems. Without addressing urban environmental issues, we cannot hope to achieve sustainability on a global level.

No human settlement can be sustainable in the strong sense of the word, if by that one means that they are self-reliant in terms of materials, use only renewable energy sources, and use only the absorptive capacity of local ecosystems. Even Biosphere II where a few people tried to live for a year in an enclosed, self-sufficient ecosystem, was a failure! However, cities can strive to be sustainable in the soft sense of the word in that they can be designed to minimize stress on nature and to restore natural functions wherever possible. Natural capital should be consumed only when it can be shown that it is essential to meeting the needs of the least well-off in society or that it helps to right imbalances in social power and opportunities.

There are two useful concepts for thinking about the sustainability of urban systems: throughput and carrying capacity. Throughput refers to the total energy and material metabolism of the city, i.e., how much in the way of clean water, fresh air, virgin materials, and energy a settlement uses in a given time period and how much it creates in terms of useable products and waste. Carrying capacity refers to the ability of ecosystems to provide resources for the city's metabolism and to absorb its metabolic waste. Carrying capacity can be analyzed in local terms (e.g., the ability of local water bodies to absorb sewage waste from a town) or global terms (e.g., the ability of the oceans or distant rainforests to absorb CO<sub>2</sub> from a city's transportation system).

Throughput is a feature of the city structure and function whereas carrying capacity is a feature of ecosystem structure and function. Together, these concepts help clarify the interaction of human settlements and nature. The goal of sustainable city design is to minimize throughput so as to avoid overwhelming the carrying capacity of local, regional and global ecosystems and to help restore those ecosystems wherever possible. Throughput can be minimized by increasing the

cycling of resources within the city system and by designing cities so that their growth and functioning requires the least possible amount of resources. Carrying capacity can be optimized by shaping urban growth so that it restores (rather than destroys) natural ecosystems wherever possible.

Although cities are very complex, there are a few basic aspects about the way cities are structured that largely determine their throughput and the stress they will place on local and global carrying capacity, i.e., how sustainable they are. "Urban form" refers to the basic spatial structure of the city. This includes the shape that the settlement takes on the regional landscape, whether it is dense or spread out, and whether it is a more or less homogenous urban fabric or whether there are nodes of concentrated development. The other basic aspect of the city that determines its sustainability is its transportation system. A transportation system can be built to privilege car use by emphasizing high-capacity roads, expressways, generous provision for car parking, and so on. Alternatively, a transportation system can be built that favours other forms of transportation, such as an efficient and reliable transit system, bike lanes, pedestrian-friendly crossings, and so on.

Urban form and transportation systems are mutually reinforcing. A sprawled urban form has various land use functions (residential, recreational, shopping, employment) spread out over a considerable distance, and almost requires that people use cars to get around. Communities like this have to have lots of roads, bridges, expressways, and parking provisions. Paying for the automobile infrastructure sucks up a large portion of the public money available for investment in the transportation system, precluding investment in an efficient and reliable transit system. Devoting so much space to the car spreads the city out even further and makes any transit system even less efficient. The lack of a good transit system reinforces declining transit use and encourages people to rely on cars to get around. It's a vicious circle.

When we think of creating sustainable cities, we have to think in the very long term. The existing urban form and associated transportation system of any given city or town is an expression of the planning and development choices that were made incrementally over many generations of settlement in that region. We cannot tear down cities and reshape them overnight. Reshaping settlements in Ontario along more sustainable lines will require a consensus on what is wrong with existing settlements and a clear vision of where we want to go in the future. The main engine of change in moving towards sustainable communities is development. Whereas the words "development" or "growth" have negative environmental connotations, we have to face the fact that only through development can Ontario's communities be transformed from unsustainable entities to more sustainable systems. The challenge is to shape development over the long-term so that we gradually improve the relationship between *Homo Urbanis* and nature. This is sustainable urban development.

## **URBAN FORM AND TRANSPORTATION PATTERNS IN ONTARIO**

The shape of Ontario's settlements differs radically depending on the location in the province and the settlement size and history. In northern Ontario, settlements are often based on single industries and grow rapidly during expansion of that industry and then decline just as quickly as

the economic activity that inspired the town fades. Rural areas in southern Ontario have small towns that are relatively compact and whose population is relatively stable. In contrast, rural areas in the hinterlands of large cities are in a constant state of flux and change as the city's growth threatens to overwhelm them. This growth takes place largely through the extension of suburban areas, a development pattern unique to North American cities. Because of the ubiquity and serious environmental impacts of suburban development, this type of development serves as a focus for this paper. However, other settlement patterns will be considered throughout the chapter as appropriate.

Suburban landscapes are immediately recognizable: they are low-density (with a high proportion of detached houses, with multiple garages on large lots), segregated in their land uses (i.e., space for living, working, playing, shopping are isolated into different parts of the suburb), and dependent on motorized vehicles (i.e., suburbs are not built for bicyclists or pedestrians). Although some progressive developers are now trying to break out of this mold, almost every suburb created in Ontario since WWII fits this description.

The growth of the suburbs reflects two post-WWII tendencies: firstly, a greater proportion of people is living in urban regions, and secondly, these regions are becoming progressively less concentrated on the urban centre. In other words, cities and towns are growing at the expense of rural areas, but our settlements are becoming progressively less urban as densities fall and cities lose their shape in formless sprawl.

Sprawling, low-density suburban development makes the provision of public transit and the use of non-motorized forms of transportation very difficult. The density of most new suburban developments is about 10-15 residential units per hectare, significantly below the 37 units per hectare that are required in order to make provision of a frequent transit service feasible.<sup>1</sup> The separation of land uses ensures that distances are maximized and makes walking or biking to their destination less attractive to many people.

Not surprisingly, post-war suburban development has been reflected in changes in transportation patterns in Canadian cities and towns. Per capita car ownership has risen dramatically since WWII and transit use has declined in tandem. As cities have spread out, trips have become more frequent and longer, resulting in greater distances traveled per year.

The low-density suburb and the automobile are mutually dependent and reinforcing technologies; they make a formidable combination in terms of personal convenience, and help create the impression that we are progressing as a society and realizing the North American dream. However, when we look at this nexus from a larger ecological point of view, we see serious problems that may not be immediately apparent to the individuals pursuing the dream.

## **IMPACTS OF SPRAWL**

Conventional development patterns have serious ecological implications:

**Energy consumption and greenhouse gas production:** Each resident of a typical Canadian city produces an average of about 20 tons of carbon dioxide per year compared to more compact cities like Amsterdam, where citizens produce only 10 tons of CO<sub>2</sub> per year each.<sup>2</sup> The transportation sector is the largest contributor to greenhouse gases in Canada, in particular carbon dioxide and nitrous oxide. Currently, burning fossil fuels in cars, trucks, trains, and airplanes generates 30 percent of all greenhouse gases produced by human activity in the country. Canada is second in the world only to the US in its per capita consumption of fossil fuels for transportation purposes. An international study of major cities showed that gasoline consumption is inversely related to urban density, i.e., the highest density cities such as Hong Kong had the lowest per capita consumption of gasoline while low density cities in the US had the highest gasoline consumption rates.<sup>3</sup> If present trends continue, emissions are expected to increase as a result of the increase in the number of vehicles on the road, the trend towards heavier personal vehicles such as vans and sport utilities, and the increasing distances traveled in sprawling communities.

**Land consumption:** Some 60 percent of Canada's housing stock is made up of single-family detached dwelling units. These dwellings require much more land to accommodate a given population. For example, at an average of 45 persons per net hectare, single-family detached homes normally house some 58 percent less people per net hectare than rowhouses (at an average of 108 persons per net hectare); approximately 71 percent fewer people than walk-up apartments (at an average of 156 persons per net hectare); and anywhere from 76 percent to 97 percent less people per net hectare than high density, multi-family housing. Residential land uses consume over 50 percent of the total area of typical Canadian cities. Along with the miles of roads necessitated by these development patterns and the auto-oriented shopping malls they tend to encourage, our living arrangements easily account for over 70 percent of land use shares in Canadian cities.<sup>4</sup>

**Destruction of farmland and the farm economy:** Because Canadian cities were often originally located so as to exploit an agricultural hinterland, urban sprawl tends to consume high quality agricultural land. In the 20 years of urban growth from 1966 to 1986, large Canadian cities spread chiefly onto agricultural land: of the 301,440 hectares of rural land urbanized, 58 percent was of high agricultural capability.<sup>5</sup> The situation is actually worse than these numbers imply; the spread of the city casts a shadow across rural areas that is much larger than its actual consumption of farmland. The urban shadow effect undermines the agricultural economy either by demoralizing farmers who believe they will be eventually swallowed up, or by raising land prices so that farming is no longer viable. It is estimated that for every hectare the city actually grows, it undermines the farm economy on a further three hectares of land.

**Groundwater pollution:** The deconcentration of urban populations has given rise to an extensive urban-rural fringe based on septic systems. In Ontario alone, there are now close to one million septic systems installed, many of them in poor condition. Health officials estimate that 30 percent of septics in Ontario are failing, contaminating drinking water and exposing the public to health hazards.<sup>6</sup>

**Stormwater runoff:** Urbanized areas are generally covered by hard surfaces that inhibit the percolation of rainwater into the soil. Instead runoff is directed into the storm sewer system and usually discharged untreated into the receiving body of water. Such water is a major source of toxic metals, chlorinated organic compounds, chemical pesticides and fertilizers, and other serious pollutants.<sup>7</sup> The more car-dependent and spread out the settlement, the greater will be the hard surface coverage and the more serious the runoff problems.

**Habitat destruction:** Expansion of the urban area destroys ecosystems – such as wetlands, natural meadows, and wooded areas – on the spreading edge of the city. The typical form of development removes all natural vegetation, levels the site, and then landscapes it with a few, often exotic species of plants. The patches of natural areas that are left over from development are often too small to support the diversity of animal and plant species that once inhabited the district.<sup>8</sup> Because vegetation plays a role in removing air pollutants, the destruction of natural heritage as the city grows also undermines the carrying capacity of the region.

**Waste production:** About 20 percent of the waste going to landfills in Canada is generated by construction activity. New construction on the urban fringe is a major contributor to this flow. Once occupied, detached housing tends to produce more waste per capita than higher-density alternatives.<sup>9</sup>

**Aggregate mining:** Aggregate resources, such as non-renewable sand, gravel and crushed stone (bedrock that is blasted loose at quarries), are used to construct the buildings and infrastructure in human settlements. Approximately 325 tonnes of aggregates are required for the foundation, concrete and mortar in an average new suburban house; about 10,000 tonnes for each kilometre of two-lane highway, and about 31,500 tonnes for a kilometre of four-lane throughway.<sup>10</sup> Because of the cost of transporting them, aggregate resources are heavily exploited where they are found within a cost-efficient transportation range of major construction markets. Over three-quarters of southern Ontario's demand for aggregates is met from just two sources: the Niagara Escarpment, which runs more than 725 kilometres from Niagara to the Bruce Peninsula, and the Oak Ridges Moraine, just north of Toronto. Aggregate extraction involves the use of heavy equipment for mining the material in open-pits and transporting the product to market. The resulting noise, dust and heavy traffic has serious impacts on human residents and other species around the pits. While some rehabilitation initiatives have successfully returned aggregate production sites to productive agricultural land, many others have witnessed little, if any rehabilitation. Long-term negative impacts include:<sup>11</sup>

- the loss of flora and fauna,
- disturbance to the water table affecting both water quality and quantity,
- the disruption of the water-cycle through increased evaporation due to the creation of surface ponds,
- the loss of provincially significant local wetlands,
- loss of high-grade agricultural land, and

- damage to cold-water fisheries.

**Air Pollution:** Automobiles and other motorized vehicles are a primary source of air pollutants in Canadian cities and towns. The extra car use associated with sprawl results in higher emissions of carbon monoxide, particulates, and smog precursors. A recent study by the federal Health Department found that breathing the heavily polluted air in Canadian cities is deadly. Mortality climbs measurably when smog is at its worst. For instance, in London the death rate surges by 10.6 percent on bad smog days and by 10.3 percent in Hamilton.<sup>12</sup> The Ontario government estimates that air pollution is responsible for 1,800 premature deaths in the province each year<sup>13</sup>

In addition to ecological problems, auto-dependent suburban sprawl has serious economic and social disadvantages:

**Reduced economic efficiency:** Recent research has shown that cities with high rates of auto-dependency and dispersed land use patterns tend to be poorer than those with compact, transit-oriented urban forms. This is because after a certain point the diseconomies associated with car use and low density suburban sprawl drain cities of wealth compared to cities with more balanced transport systems and less dispersed urban land use.<sup>14</sup> The socially homogenous developments typical of Ontario's suburbs are also expensive to build. Because new suburbs are targeted toward specific homogenous groups, they are built with infrastructure appropriate for that group (e.g., public schools for families in starter homes). As the population enters the next stage of its life cycle, services initially provided become redundant, and new services, consistent with the life cycle, have to be provided. More socially diverse communities would have a balanced set of facilities that would not have to be replaced over the short term.<sup>15</sup> Finally, suburban sprawl can lead to the economic and social decline of central cities. Suburban development draws employment and population away from the older parts of the city, sometimes triggering a downward spiral of falling property values, declining services, rising property taxes and further middle-class flight to the suburbs.

**Changing social realities:** The suburbs have failed to respond to changes in the social structure of urban society. Suburban development patterns, having been based on the concept of the nuclear family with a male breadwinner and a female home worker, no longer reflect social realities. With the mass recruitment of women to the paid workforce, the isolation and car-dependence of suburban houses appears less appropriate to many women and their families. Other key demographic changes are the gradual aging of population in many communities and the increasing numbers of empty nesters. Falling average household sizes reflect the increasing number of single-parent and single-person households. These demographic changes point towards a shift in housing demand away from larger, single-family detached houses towards a wider range of housing choices, including smaller- and medium-sized new houses and units that can be provided through infill and conversion of existing stock.<sup>16</sup>

## THE CAUSES OF UNSUSTAINABLE SETTLEMENTS

It is important that we understand the causes and costs of sprawl before we propose what to do about it. The causes of sprawl are very complicated, but a few key factors can be mentioned here:

**Ineffective Municipal Planning:** Developers purchase land beyond the urban envelope at low prices. As the settlement grows, the value of the land rises and the owner approaches the local council about rezoning the land from agricultural to urban uses. A decision to rezone the land dramatically increases the land's value and represents a windfall profit for the owners. The development community has a lot of political power at the local level and can often convince local politicians to override good planning principles in their decisions about whether or not to rezone land. Municipalities are also tempted to give in to developers because of the prospect of increased revenues from residential and commercial property taxes and, in the case of industrial and commercial development, the lure of new investment and jobs in the municipality. Thus, some municipalities make hundreds of amendments to their official plans in order to extend the urban envelope to allow development on rural land. The result of these incremental decisions is unplanned growth of the urban area and less incentive to accommodate population growth through infill and redevelopment within the existing urban envelope. Many municipalities also reserve large tracts of land for industrial and commercial uses that may never be used, pushing residential development even further out onto rural land.

**Public Resistance to High Density Living:** High-density living is often associated with crowding, social malaise, congestion and pollution. Few existing residents of urban areas want to see their neighbourhoods intensified through infill development on vacant lands, or to see the redevelopment of low-density areas into high-rise apartment buildings. Neighbourhood groups form a potent force opposing many intensification proposals, either in already built-up areas or in new subdivisions adjacent to low-density neighbourhoods on the urban fringe. Such opposition creates political and financial uncertainty for developers, many of whom are dissuaded from seeing their intensification proposals through.<sup>17</sup>

**Lack of Regional Coordination:** Urban regions that are made up of a number of individual municipalities need to be managed by a regional body with land use planning, infrastructure planning, and revenue raising powers. In urban areas without such a body, municipalities cannot raise money and make the decisions to invest in regional infrastructure (such as mass transit or a major sewage system) necessary to properly manage growth. Without a regional coordinating body, municipalities may compete against each other to attract development, resulting in more sprawl. Acting alone, municipalities may also try to avoid accepting their fair share of higher-density, low-cost housing, resulting in the geographic polarization of the regional population along income lines, with some municipalities specializing in socially exclusive neighbourhoods while others are forced to accommodate low-income residents with greater need for expensive social services.

**Infrastructure Financing Policies:** The growth of a city or town requires large scale investments in urban infrastructure, including roads, bridges, transit facilities, water and sewage treatment, schools, hospitals, fire and police stations, recreational facilities, and so on. These investments are paid for, in part, by municipal governments who raise money according to the

rules set down by provincial legislation. Unfortunately, these rules usually don't take into account the impact they will have on patterns of land use and development in the city. In fact, these mechanisms often militate against more efficient land use patterns. For instance, property taxes on apartment buildings are sometimes three or four times the rate of taxes on low-density detached houses. Development charges, which are collected from developers to pay for the infrastructure required to support new growth, are often based on a flat-rate approach. This approach ignores the fact that some developments are more efficient in terms of land use and infrastructure requirements than others. Thus, a housing project on a vacant parking lot in the downtown area will pay the same development charge per new resident as a large-lot detached house at the urban fringe, despite the obvious difference in new infrastructure requirements. This means that suburban growth, with its heavy demands on urban infrastructure, is subsidized by growth in the already urbanized area.

**Car Subsidies:** Economic factors, such as the low price paid for gasoline in Canada and the many hidden subsidies for cars, also promote auto-dependency. For instance, road building and maintenance costs are paid through taxes, free parking facilities are provided by employers, and environmental damages caused by cars are silently imposed on future generations. Under these conditions, it is not surprising that transit has trouble competing for users. A study done for the city of Pasadena in the US found that a gas tax increase of 21 cents per gallon would be needed to cover auto-related policing, emergency health, fire and other municipal auto-related costs.<sup>18</sup> Estimates of the costs due to "externalities" caused by cars such as air pollution, water pollution, noise, accidents and congestion in the US vary from \$378 billion to \$935 billion (US) per year, the equivalent of \$2.86 to \$7.08 (US) per gallon of gasoline consumed.<sup>19</sup> In Canada, a 1995 study carried out for the Climate Change Collaborative estimated the hidden costs of public transit at less than one cent per passenger-kilometre, compared with two cents per passenger-kilometre for the urban automobile. For automobiles, this works out to \$500 per vehicle per year. The hidden cost of the urban automobile increased to almost eleven cents per passenger-kilometre when a broader set of automobile effects was considered, including congestion, parking and land costs.<sup>20</sup>

**Lack of Integration Between Land Use and Transportation Planning:** In this chapter we have pointed out the importance of the link between land use and transportation systems. Unfortunately, many land use decisions are made without properly considering the implications for transportation issues and vice versa. For instance, the provincial government may plan a new highway (such as the 407 going through the Greater Toronto Area) without considering the impact it will have on residential and business location decisions. Or municipalities may plan a new low-density subdivision without thinking about how residents can gain convenient access to transit services.

**Inefficient Development and Building Standards:** Development standards refer to the rules developed by the province and municipalities to ensure quality development and avoid future problems. They relate to issues like the setbacks of buildings from the roadway, separation of different land uses, and the width of sidewalks and roads. Likewise, building standards refer to issues like the minimum width of stairwells and hallways. To a large degree, the current



standards guiding development in Ontario have their origin in the values and imperatives of the 1950's to 1970's, a time of rapid public expenditure, relatively low costs and less environmental awareness. Not surprisingly then, current development and building standards are very generous with their use of space. Each public agency has set its standards in isolation and the overall result has been a highly land-consumptive development pattern that no single agency would have wanted or required. Now that urban sprawl has become a public issue, we are rethinking the spatial aspect of these standards and alternative standards are being proposed.

**Fragmented Approach to Land Use Decisions:** Land use decisions are often made on an isolated basis without reference to the larger ecological context. Aggregate extraction in urban areas is a good example. While an individual mine site rarely poses a serious ecological threat, several operations within an area can have significant cumulative environmental impacts. However, the current regulatory regime examines aggregate extraction in a piecemeal manner. North Dumfries, for instance, is faced with 16 existing and proposed pits operating within a 3.5 kilometre radius, all of which were assessed on an individual basis as required by the *Aggregate Resources Act*. But sand and gravel deposits that make up the aggregate sources are also instrumental in forming the aquifers for groundwater storage and recharge. As a result, large-scale mining of these groundwater storage reserves affects both water storage and flow regimes. Thus, individual assessments of specific problems are inadequate for developing and understanding cumulative environmental impacts on groundwater regimes. Unfortunately, even where plans are based on cumulative impact assessment, they are not always fully implemented.

## CURRENT POLICY TRENDS

Despite the fact that increasingly spread-out, segregated, and auto-dependent Canadian settlements have serious environmental, social, and economic problems, the situation is not as grave as in the US. The central areas of Canadian cities are economically healthier, more vibrant and safer than their US counterparts. Suburban areas in Canadian cities and towns are on average about twice as dense as their US counterparts, automobile ownership and per capita car usage and gasoline consumption are lower, and transit use is substantially higher. There is much less in the way of leapfrog development around Canadian cities and towns; our urban areas tend to grow in a relatively contiguous fashion.<sup>21</sup>

These differences can be at least partially explained by the fact that Canada has a stronger tradition of assertive land use planning, better regional coordination to control sprawl, and a greater willingness to make the large investments in social and physical infrastructure that are required to make central cities work. In Ontario, Conservative, Liberal and NDP governments at the provincial level have taken steps over the last 30 years to try to direct strong urban growth pressures. They created regional governments, strengthened land use planning and environmental protection policies, invested in public transit and built social housing in central cities and suburbs to accommodate the housing needs of a diverse population.

Until recently, these trends were being strengthened, as governments became increasingly aware of the costs associated with unsustainable urban development. As part of this trend, the NDP

government that held office in Ontario between 1990 and 1995 established the Commission on Planning and Development Reform (or the Sewell Commission, after its chair John Sewell) to review the planning process and recommend legislative and policy changes. The main goals of the Commission were to streamline the planning process and increase its public openness, redefine provincial and municipal responsibilities, and incorporate environmental issues into land-use planning.

After an exhaustive consultation process involving environmental groups, municipalities, developers and other stakeholders, the Commission released its final report in 1993 and its recommendations were substantially incorporated into legislative and policy changes that came into effect in March 1995.<sup>22</sup> As part of the reform package, a comprehensive set of policy statements was elaborated that required municipalities to adopt planning policies to control sprawl, prevent development on environmentally significant lands (including wetlands, recharge areas, woodlots), discourage rural severances and preserve agricultural land (especially specialty croplands), increase residential densities, and encourage affordable housing production. The affordable housing goals built upon earlier legislation introduced by the NDP requiring that municipalities across the province allow basement apartments in all detached and semi-attached dwellings and townhouses.

The comprehensive set of policy statements was backed up by very detailed implementation guidelines, which were developed through consultation with stakeholder groups. These guidelines provided municipalities with further information on the meaning of the policy statements, and suggested a variety of means to fulfill them. This included detailed suggestions on how to design cities and neighbourhoods in order to encourage transit and non-motorized transportation choices. Although these guidelines were not mandatory for municipal planning, they certainly signaled the direction the province was moving in and could be used by progressive councillors and planners to argue for planning policies that would move the municipality away from car-dependency.

The policy changes were accompanied by legislative changes (Bill 163) that had two main goals: to reduce the province's power to intervene in municipal development decisions (i.e., its approval authority), but to give more legal weight to the province's strengthened policy statements (i.e., its policy authority). The first goal was achieved by delegating provincial approval power over official plans, plans of subdivision, condominium plans, and severances to municipal authorities and by removing the province's option of declaring an issue of provincial interest before the Ontario Municipal Board (OMB), the tribunal that decides on planning conflicts in the province. This meant that the province could no longer intervene at the last minute to overturn OMB decisions as it had in the past, a practice that enraged municipalities.

The second goal was achieved by requiring that municipal official plans and other planning decisions were to "be consistent with" policy statements under the revised *Planning Act*, replacing the earlier "have regard to." "Be consistent with" was thought to provide less leeway to municipalities in interpreting provincial policy objectives. Essentially this meant that provincial policies would carry more weight at the municipal level and with tribunals such as the

OMB. Also important was the provision that the province would stipulate mandatory contents of upper- and lower-tier official plans through regulations. Such contents were likely to include population and housing projections, infrastructure planning, and density provisions.

These changes to the planning system in Ontario would have done much to reign in municipal expansion tendencies and to encourage transit-supportive, compact development patterns. Unfortunately, the Progressive Conservative government, elected in June 1995, repealed most of the changes to the planning system wrought by the NDP in order to achieve its goals of streamlining the planning process and removing regulatory obstacles to economic development. In fact, Bill 20, which became law in July 1996, removed more provincial powers than the NDP had added. Changes included the:

- removal of the content requirements for official plans;
- repeal of the “as-of-right” apartments in houses legislation, restoring municipal discretion over the right of home owners to establish basement apartments;
- repeal of the “be consistent with” enabling clause for policy statements and return to the “have regard to” clause;
- reduction in the prescriptiveness and detail of the comprehensive policy statements; and
- provision that only the Minister of Municipal Affairs and Housing (the two ministries were combined) could appeal municipal planning decisions to the OMB, removing the right of appeal from ministries such as Transportation, Natural Resources, Environment and Agriculture, Food, and Rural Affairs.

The new policy statement was less than half the length of the comprehensive set adopted by the NDP. The new housing policies did not require that municipalities provide opportunities for affordable housing or intensification through their planning decisions. Requirements that new development be compact in form and that urban expansion occur as logical extensions of the existing urban fabric were also dropped. Provisions to support transit were considerably weakened in the new policy statements.

Environmental policies underwent significant changes. The new policy statement maintains the restrictions on residential development in prime agricultural areas, but other policy changes will probably weaken farmland protection. Restrictions on development were maintained in significant wetlands and endangered and threatened species habitat, but reduced for some other natural features. These changes include a reduction in the geographical area where the greatest restrictions apply, removal of outright restriction on development that will negatively affect groundwater recharge areas, head-waters and aquifers that have been identified as sensitive areas, and removal of the requirement that the proponent conduct an environmental impact study in areas adjacent to protected natural heritage features and areas. In addition, regulatory control over important environmental issues such as septic systems in rural areas was transferred to municipalities.

The changes strengthened the movement towards devolving planning approval powers to the municipalities that had been initiated by the NDP. The NDP reforms were to ensure that these

increased municipal approval powers would be responsibly exercised by placing them in a stronger provincial policy framework with greater legal weight at the local level. In contrast, the PC changes weaken the policy framework and the legal weight of provincial policies at the local level. Essentially, this means that municipalities have been handed more autonomy over development decisions and the role of provincial agencies with a mandate to protect the environment has been drastically reduced.

Recent changes also give more responsibility to private firms to regulate their own activities and reduce opportunities for public involvement. For instance, amendments to the *Aggregate Resources Act* abolished the Ministry of Natural Resource's duty to regularly inspect new pits and quarries. Instead, aggregate producers themselves file annual reports on their operations. This approach relies on the dubious assumption that pit and quarry owners will fully reveal the environmental shortfalls of their operations. It also removes the public's right to a hearing before the Ontario Municipal Board. Instead the ministry will have the sole power to ask for a hearing and to mediate conflicts between local residents and gravel pit operators.<sup>23</sup>

While municipal officials and developers appear to appreciate the greater independence from provincial oversight that these changes offer, many observers are concerned that they do not have the institutional capacity to deal effectively with their increased planning responsibilities. The result will undoubtedly be a more chaotic planning and development process, greater sprawl, and less protection for the environment.

These changes to the planning system have been complemented by important changes to the governance of urban areas in Ontario. Most important are municipal amalgamation and downloading of financial responsibilities to municipalities. While amalgamation does not have direct impacts on the environment, it is being accompanied by across-the-board cuts to municipal budgets. Municipal officials desperate to find opportunities for budget cuts may focus on cutting environmental programmes as these often fall outside core departmental responsibilities and rarely have strong institutional sponsors. Recent talk of reducing or eliminating blue box programmes in some municipalities reflects this reality.

The downloading of financial responsibilities to municipalities is having a more direct effect on the sustainability of Ontario cities and towns. The province has withdrawn funding for municipal sewer and water services and for road construction and maintenance. By themselves these changes might have helped to reign in development pressures on the urban fringe, but they have been combined with other changes that may well tip the balance towards more sprawl, including:

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- the elimination of provincial subsidies for municipal public transit systems. From now on, transit systems in Ontario will be among the only ones on the continent to be supported only by fare boxes and municipal taxes. Many public transit systems across the province are already reducing services and some are considering folding altogether.
- the end of social housing programmes. Provincial (and federal) investment in social housing was generally directed to building higher-density housing in areas well served by transit. This

helped intensify and diversify existing urban areas and provided added ridership to urban transit systems. The elimination of new funding for social housing will mean greater pressure for lower-income families to locate on lower-priced land far from employment opportunities and urban services, i.e., more sprawl.

- changes to the *Development Charges Act*. The new Act reduces the contributions expected from developers to pay for the infrastructure that goes into new suburban subdivisions. From now on, municipalities cannot charge developers for new waste management facilities, acquisition of land for parks, additions to the city hall necessitated by suburban growth, or other facilities to be set out in provincial regulations. Furthermore, municipalities will be forced to cover some of the cost of the facilities that they are allowed to charge for. All told, the new Act will mean that subsidies to suburban development will increase as the developers pay less of the cost associated with suburban growth. The result, again, may be more sprawl.

## VISIONS OF SUSTAINABLE SETTLEMENTS

The sprawled city has produced a counter-revolution in thinking about desirable urban forms. Over the last several years, many planning, policy and advocacy documents have proclaimed an emerging consensus that cities must pursue new patterns of development that will result in a more compact urban form. The vision of a more compact urban form is composed of two interlinked aspects: a densely settled mixed-use urban form, and a sustainable transportation system. Lang and Armour provide a typical vision of a more compact urban form:<sup>25</sup>

The settlement is compact. Little urban sprawl, strip development or underutilized land exist, the result of infilling and development controls. Nor does the settlement spread into its hinterland's agricultural areas and forests, which are seen as valuable energy resources.

Places of work, residence, shopping and recreation are well related to each other and to the transportation system, and people choose to take advantage of them rather than making long automobile trips. Population densities in most parts of the community are sufficiently high to make transit feasible; it is also convenient, efficient and heavily used. Clustered along transit corridors and in the settlement's several centres are complexes that mix a wide range of activities for mutual advantage.

A variety of progressive transportation organizations in Canada have proposed visions for a transportation system based on alternatives to the automobile.<sup>26</sup> Perhaps the most evocative vision is provided by Vanderwagen's image of suburban areas around Toronto in the year 2030.<sup>27</sup>

That afternoon, we return to Union Station and board a commuter train for a tour of the older suburbs and, beyond them, the late-twentieth-century "edge-cities"... Our first stop is the suburb of Manorville. The commuter-rail station where we get off is part of a transit hub that functions as Manorville's new "town centre". The

former commuter parking lot has been redeveloped with offices, stores, apartments, and a theatre grouped around a public square.

From here we can connect with a Light Rail Transit (LRT) line and the local bus network... These quiet, sleek, three-car trains travel on their own right-of-way in the middle of the arterial roads or, sometimes, on off-street rail corridors. The LRT route has evolved, through redevelopment, into the principal spine or "main street" of the community. Trains run two minutes apart during rush hour and five minutes apart at all other times.

On the local streets serving the original low-density residential neighbourhoods, office parks, and industrial zones, bus service is less frequent – 10 minutes apart during rush hour and 20 minutes at other times. These "feeder" routes lead to the town centre and/or main street, or connect with other feeder routes by means of "timed transfers". These low-frequency routes operate according to "clock-face" schedules, whereby the bus arrives at a given stop at the same intervals on the clock each hour (1:00, 1:20, 1:40) making it easy for riders to remember the schedule. Along these routes, every bus stop has a shelter, where a route map, schedule and phone number are posted.

The town centre station is very accessible to pedestrians and bicycles and provides an indoor bike parking area complete with a repair shop. For those who wish to take their bicycles with them, the trains and buses are equipped with bus racks. There are bike lanes on all the major roads and a network of off-street bike paths – which are also used for hiking, roller skating, and cross-country skiing in winter. All the streets are pleasant for walking, with good sidewalks and frequent protected crossing areas. Obstacles to pedestrian access have been systematically removed over the years. The winding internal patterns of the suburban subdivisions have been modified to provide more direct access to main roads, so that transit routes and corner stores are a five-minute walk from almost every home.

A more compact settlement with a sustainable transportation system has a number of environmental, social and economic advantages over current urban forms. Besides obviating many of the problems discussed in the last section of this chapter, more densely settled cities allow for the installation of environmentally-friendly infrastructure.<sup>28</sup> For instance, higher density residential development can make blue box systems more affordable to operate. Higher density settlements can also take advantage of the potential for cogeneration and district heating. Both are highly efficient in the delivery of space heating to households, a use that accounts for 67 percent of all residential energy consumption. Minimum housing densities of about 44 units per hectare must be achieved before cogeneration and district heating can be a viable alternative, considerable above much of Canada's single-family housing at 10-15 units per hectare.<sup>29</sup>

Higher density cities are also cheaper to build. A recent Canadian study explored differences in public and private costs for two types of developments: a conventional suburban design and a more compact “neo-traditional” design.<sup>30</sup> The authors concluded that the total life-cycle cost (over a 75-year period) of the infrastructure in the alternative plan was approximately \$11,000 per unit, or 8.8 percent less than in the conventional plan. The authors attributed the lower costs of the alternative plan to the increase in residential density and to the increase in land-use mix.

Other studies have found that in high density areas, energy consumption from auto transport, space heating and cooling requirements are more than 40 percent lower than in low density residential developments. Water consumption is reduced by approximately 35 percent in high density communities.<sup>31</sup> A 1985 study in Sault Ste. Marie found that semi-detached and townhouse units consume an average of 66,400 MJ/unit annually, and that apartments consume 33,200 MJ/unit annually. These figures were 20percent and 60 percent less respectively than detached units, which consumed 83,000 MJ/unit annually.<sup>32</sup>

More compact and diverse communities also respond better to changing social and economic conditions. In most communities, home ownership in the form of a detached house on a 15 m lot is out of reach for a significant proportion of the population. Accordingly, costs have come under close scrutiny. A study done in 1990 for the Ministry of Housing found that potential savings in servicing costs from using more space conservative development standards would be in the range of \$4,000 to \$6,000 (1990 dollars) per unit. When land costs were included, potential savings of \$9,000 to \$9,500 per unit were estimated.

## RECOMMENDATIONS

The recommendations outlined below are addressed to provincial and municipal governments and draw on

### **Regional Growth Management, Greater Vancouver Regional District, B.C.**

The Greater Vancouver Regional District (GVRD) is a regional government comprised of 20 municipalities in the lower mainland of B.C. Because it encompasses over 90 percent of the population within the functional region (i.e., within commuting distance of downtown Vancouver), it is in a good position to exercise control over regional growth patterns and to control sprawl. The Livable Region Strategy calls for more compact urban development by directing a larger share of residential growth into the region’s central area and older suburbs, with slower growth in newer communities up the Fraser Valley. Community growth will be balanced between residential and employment uses in order to reduce commuting distances in the region. The plan also strengthens the region’s commitment to protect the Green Zone where ecologically, agriculturally and recreationally significant lands are located. The plan is linked to Transport 2021, the regional transportation plan that is attempting to tip the balance in favour of transit and non-motorized forms of transportation and away from car travel. When developed in 1994, the strategic plan had voluntary status only. However, BC’s new *Growth Strategies Act* amends the *Municipal Act* to provide legislative authority for regional growth management strategies. The Act requires that municipalities prepare a regional context statement showing how the official community plan is or will be made consistent with the regional plan. The legislation outlines a variety of dispute resolution mechanisms and casts the province as a facilitator in a system of dispute arbitration.

three of their key functions: regulatory powers, revenue raising and spending powers, and facilitating behaviour change of individuals and firms. Recommendations are divided into two main categories: those that contribute to sustainable land use patterns and those that encourage sustainable transportation systems.

## **Land Use**

The goals of sustainable land use planning are to achieve a better mix of land uses, at higher overall densities and to concentrate development in centres and sub-centres that can serve as transit nodes and make optimum use of urban infrastructure. Urban design should focus on creating more pedestrian- and bike-friendly and transit-supportive urban environments.

As the environmental, health, economic and social consequences of urban sprawl and car-dependency are increasingly manifested in Ontario, the provincial government will have to reassess its strategic decision to remove itself from local planning matters. We recommend that the province reassert itself as a guardian of sustainable urban development in Ontario. This will undoubtedly entail a shift back to stronger provincial planning policies, more monitoring and enforcement of municipal planning decisions, and greater controls over private developers.

## **Improve Regional Growth Management**

Regional growth management refers to the strategic decisions to coordinate growth, infrastructure development and housing production and employment generation within an urban region so as to reduce the environmental, social and economic costs of rapid change. One of the key prerequisites of regional growth management is the existence of a regional governing institution with powers to make the necessary strategic decisions. Ontario has taken hesitant steps towards regional government since the early 1970s. In some urban regions, upper-tier municipalities were created in order to pool taxes and make investment and planning decisions to stimulate and direct growth. In the meantime, however, urban growth has spilled out beyond the limits of some of these inter-municipal bodies and they need to be expanded in order to maintain their relevance. Some regional councils are weakened by the fact that they are made up of representatives from lower-tier municipalities that do not have a regional perspective. These regional municipalities should be converted to directly elected regional councils. The Greater Toronto Area presents a special case in that the upper-tier bodies set up by the province never encompassed the whole urban region. Regional planning in the GTA has thus fallen to the relatively powerless Office of the Greater Toronto Area, a provincial agency that serves as an intermediary between provincial ministries and municipal leaders in the GTA. Presently, the province is creating a Greater Toronto Regional Services Board with very limited powers. This body's mandate should be enhanced to include some authority over municipal landuse decisions and a major role in the planning and financing of regional infrastructure projects.



### **Enhance Public Involvement in Growth Management Decisions**

Increasing public awareness of issues related to urban growth and its environmental, social and economic consequences is essential to building strong support for growth management policies. Mechanisms should be found for providing citizens with realistic alternatives with respect to growth management options. Residents sometimes desire incompatible development objectives: for example they may not want to see expansion of the settlement onto rural lands but may also reject intensification of existing areas. Experience in other jurisdictions suggests that when planners present citizens with a choice between intensification and realistic alternatives, resistance to intensification softens; for example, when confronted with the choices between more residential growth in their neighbourhood and increasing traffic congestion from commuters beyond the neighbourhood, citizens choose the former.<sup>33</sup> Tying it to improvements in neighbourhood quality can also minimize public resistance to intensification. For example, funding for neighbourhood amenities such as parks, daycares and libraries in neighbourhoods could be linked to an acceptance of increased densities. Such linkages are being considered in the Vancouver region and should be considered in Ontario's urban areas. Formal processes of public involvement in urban design issues can also increase support for sustainable urban development. In order to increase citizen involvement in planning decisions, the province should provide intervenor funding to non-profit groups to undertake research and retain expert advice in their appearances before decision-making tribunals such as the OMB and the Environmental Assessment Board.

### **Co-Design, South-East False Creek, Vancouver, B.C.**

Co-Design is a process of public participation, whereby people are asked to visualize a preferred way of living. Their thoughts and imagings are then recorded graphically in a series of pictures, and these provide a design framework for the architect/planner. This type of visioning engages the community through a constructive process of public participation. Recently, Co-Design was involved in promoting a unique public dialogue around the controversial land-use conflict in Vancouver's South-East False Creek. The purpose was to encourage citizens' in the area to imagine how they wanted to see their community evolve. At the same time, project designers sought to challenge some of the assumptions made by professionals in the housing industry about the type of community people of the future want to live in. Through a process of intensive brainstorming, participants articulated the images in an hour-by-hour sequence of activities over two imaginary days (one special day and one ordinary one) in the life of their ideal imagined community. Facilitators fielded ideas and images and encouraged participants to describe the scene in a series of key words and to rate it for important features. During the process, the facilitators sketched the ideas into images. Almost all of them imagined themselves living in a community characterized by the dense development that is the basis of sustainability. The participants were also drawn to other images associated with urban sustainability, i.e., walking, cycling, and public transit.<sup>1</sup>

### **Adopt Permanent Urban Boundaries**

The Comprehensive Policy Statement under Section 3 of the *Planning Act* should be amended to require that every municipality in growing regions of the province adopt an urban containment boundary. Such a boundary can help control sprawl by setting a permanent (or long-term) limit on the spread of the urban envelope. The boundary would signify the point past which the municipality will not provide urban services such as sewer and water facilities. The amount of rural land available for development within the boundary should be calculated on the expectation that municipalities will achieve target residential densities for new developments within the boundary. Changes to the boundary should only be allowed after the municipality has met stringent conditions, such as holding a referendum, adopting a growth management plan, and adopted policies to encourage intensification of the existing envelope.

Such urban growth boundaries have worked well under certain circumstances when adopted in other jurisdictions, such as in the USA. For instance, Portland, Oregon has used an urban growth boundary to build a more compact, transit-friendly city. However, boundaries do not themselves solve the problem of sprawl. As experience in other jurisdictions has shown, such as Sarasota County in Florida, unless boundaries are supported by other planning decisions that favour higher density development within the boundary, it's just a matter of time before pressures to expand the boundary become irresistible. Boundaries can also attract a lot of political opposition if they are seen as inhibiting the economic development of the city (by reducing the amount of land available for industrial or commercial development) or as an impetus to the rising cost of housing (by limiting the supply of new housing). Thus, it is important that urban growth boundaries be accompanied by supportive policies to mitigate side-effects and by extensive public education campaigns to explain the goals and benefits of the boundary.

### **Urban Containment Boundary, Portland, Oregon**

Portland, Oregon has received international attention for its Urban Growth Boundary (UGB) instituted in 1974 in response to state legislation (*Oregon State Growth Management Act*), and expanded only very slightly since then. The boundary sets a geographical limit outside of which urban services (water and sewer) are not provided and almost no development is permitted. The UGB is thought to be at least partly responsible for the high quality of urban life in the Portland metro area, which incorporates the City of Portland and 23 suburban and rural municipalities. Essentially, the UGB acts to reflect growth energies from the periphery back into the city and increases awareness of land as a scarce resource that must be used wisely. The result is a higher density, more diverse urban environment with a lively downtown and a successful mass transit system. After adopting the UGB, average lot sizes in the Portland metro area decreased from 12,800 square feet in 1978 to about 7,400 currently, and are expected to decrease further to 5,600 square feet under the 2040 plan, which will permit a moderate extension over the UGB to accommodate growth over the next few decades. More than 50 percent of new residential construction is now multifamily and new development tends to be concentrated in higher-density, mixed-use town centers that lend themselves to mass transit. The UGB has not been without its critics, however. Most importantly, developers claim that by restricting the supply of urban land, housing prices are higher than they would otherwise be, penalizing young families who are just entering the housing market as buyers or renters. Although the evidence to support this claim is ambiguous (housing prices have risen in urban regions with no UGB), local governments have taken steps to try to increase the supply of affordable housing.<sup>1</sup>

## Implement Alternative Development Standards

Ontario has already created a comprehensive set of alternative development standards, which addresses one of the causes of sprawl, i.e., the tendency of public agencies to require planning, building and development standards that are excessive in their use of space. The publication *Making Choices* addressed this issue by proposing new standards such as reduction in set-backs for houses, separation distances between different uses, utility separation distances, roadway widths, and turning radii at intersections. The problem with the province's more space-efficient alternative standards is that they are purely voluntary and have been adopted by only a handful of developers within the province. Many suburban municipal officials are uncomfortable using these standards because they create a more urban than suburban feel to neighbourhoods and because they believe that alternative standards mean lower standards, which will cause more problems in the long run. The province should encourage the use of alternative development standards by undertaking research into their economic and environmental benefits and by incorporating the research results into a comprehensive public education campaign aimed at developers, municipal officials, existing residents and those looking to buy or rent homes.

### Champion Mixed-Use Development

Traditional zoning by-laws control development by prescribing the type of land use that can occur on any parcel of land. This tends to create isolated enclaves of residential, shopping,

### Alternative Development Standards, Montgomery Village, Ontario

Montgomery Village is a recent development in the town of Orangeville, approximately 70 kilometres from Toronto. The developer is creating 550 housing units on a 100 hectare site that will accommodate 1800 people. The development has been hailed because it is one of the first "wired" communities in Canada: the developer spent more than \$1 million on a communications infrastructure that loops all the houses together by coaxial cable in a computerized local area network. This infrastructure makes it easy for Montgomery Villagers to work at home, save commuting costs and live a more sustainable lifestyle.<sup>1</sup> It is also one of the first examples in Canada of a community scale development that incorporates Alternative Development Standards including:

- grid block pattern with reduced right-of-way widths (e.g., 16 m rights-of-way for local streets; 20 m rights-of-way for collector roads);
- all houses have garages located at the rear of the habitations serviced by public rear lanes;
- stormwater is collected through the use of drainage channels or swales and directed to temporary ponding areas for storage and purification;
- stormwater management functions were integrated into the parks, greenways and school sites;
- the development incorporated narrower lot frontages (e.g., 6 metres for townhouses and 9 metres for single-detached units);
- development densities are comparable to those found in traditional urban neighbourhoods and historic parts of small towns;
- the density of the development is transit-supportive and supports more affordable housing;
- there are reduced front-yard building setbacks to 3 metres;
- on-street parking and reduced/shared parking standards; and
- flexible zoning allows for accessory apartment units or self-contained garden flats.<sup>1</sup>

recreational, employment and other uses, a practice that encourages the use of cars in getting from one activity to another. Mixed-use development, i.e., residential areas incorporating a range of services and employment opportunities would reduce the need for car travel, and would make urban areas more vibrant and attractive as places to live. The province could encourage mixed-use development by incorporating this goal in its “Comprehensive Policy Statement”, and by providing research and technical support for experimenting with alternative approaches to zoning. One such approach is called performance based zoning. This approach de-emphasizes the control over development based on land use functions and shifts the emphasis to the requirement that development, whatever the land use type, meet stringent environmental criteria. For example, instead of prohibiting industrial uses in a residential zone, performance based zoning might set limits on noise creation and truck traffic. Any industry that can meet these objectives could establish itself peacefully in a residential neighbourhood. At present, this approach is being experimented with in certain locations within Toronto and in other municipalities in Canada and internationally.<sup>34</sup> Implementation of such an approach to zoning at the local level would have to be carefully monitored by provincial authorities to ensure that municipalities are enforcing the environmental criteria and that the burden for ensuring compatible development is not falling unduly on local residents.

#### **Promote Intensification and Transit-Supportive Land Use**

Ontario has already developed a detailed set of recommendations to encourage municipalities to adopt planning and urban design policies to encourage a transit- and pedestrian-supportive urban form.<sup>35</sup> Planning policies include reducing parking requirements for residential and employment uses, allowing a wider range of housing types in low density zones, designating more medium and higher density residential areas, allowing mixed-use development, and directing new residential and employment growth into the downtown and regional sub-centres that are linked by high-quality transit services. Urban design policies include a grid street pattern (instead of the curved and dead-end streets that make suburban areas difficult to service with buses), a maximum

#### **Municipal Development Plan, Halifax, Nova Scotia**

Over the last 25 years, Halifax has experienced a significant population decrease, while the suburban and rural areas outside the city have grown rapidly. These trends have shifted the tax base away from Halifax, produced a less efficient use of existing infrastructure, and entailed longer commutes and traffic congestion as increasing numbers of suburbanites commute to jobs in downtown Halifax. Intensification of the central area can help balance residential and employment locations, encourage walking and transit use, and reduce commuting and greenhouse gas emissions. With its new Development Plan, the City of Halifax aimed to attract new residents to the central city as a way of optimizing the use of existing infrastructure and stabilizing population levels. The Plan contains a general policy to encourage residential development on the Peninsula through infill, redevelopment of industrial land and rehabilitation. There are also several detailed area plans that promote intensification elsewhere in the city. While most zoning designations permit single to multi-family conversions, one designation encourages additions to the rear of existing buildings to permit up to 14 dwelling units. Other designations encourage mixed use projects permitting high density residential development with minor commercial uses. As a result of the plan, a number of industrial areas have been redeveloped and some schools that are no longer needed have been converted to residential use. Infill projects in the intensification zones have proceeded.

distance of 400 metres from any house or workplace to the nearest transit stop, and sidewalks along transit routes. Unfortunately, these policies were never made mandatory in Ontario and were never linked to provincial subsidies for transit. Now that the province has downloaded the responsibility for funding transit, it has less leverage to influence municipal decision-making on this matter. If, however, the province does re-establish funding for transit in Ontario's municipalities, this funding should be linked to the adoption of transit-supportive land use policies in municipal official plans. In the absence of, or in addition to, financial incentives, the province should strengthen the Housing section in the Provincial Policy Statement under Section 3 of the *Planning Act*. For example, the section could include performance measures, such as the requirement that municipalities approve new developments only if they will not lead to an increase in car traffic along key arterial streets. Such measures would provide more direction and accountability in municipal planning.

Finally, the province should adopt measures that will increase the supply of affordable housing while achieving land use objectives. Towards this end, the government should re-establish funding for new social housing initiatives and establish explicit criteria that favour higher density projects in already urbanized areas with good transit access. The decision to repeal the legislation allowing basement apartments should also be reversed.

**Adopt Ecosystem Planning Principles**  
The ecosystem approach to planning contrasts with conventional planning in that it is based on ecosystem units (rather than municipalities), targets ecosystem stability and restoration as its main goal (rather than economic growth), and involves a high degree of public involvement in preparing the plan (rather than perfunctory public meetings). Since the ecosystem approach examines cumulative environmental impacts, it can result in economic savings by avoiding the need for costly and difficult remedial actions.

#### **The Ecosystem Approach, The Oak Ridges Moraine, Ontario**

The Oak Ridges Moraine, spanning approximately 200 kilometres from the Niagara Escarpment to the Trent River, is a ridge formed by receding glaciers during the last Ice Age. Its porous layers of sand, silt and gravel provide deep aquifers, sources of groundwater that feed springs and cold-water streams for rivers in the Greater Toronto Area (GTA). The large forested areas of the moraine also act as green lungs by capturing particulates and other air pollutants emitted in the GTA. However, one of its greatest advantages may be its undoing: its accessibility. Much of the moraine is within an hour's drive of densely populated portions of the GTA. This situation has created unrelenting competition between three potential uses for the moraine: urbanization, aggregate production and conservation. In 1991, in recognition of the importance of the moraine, the Ontario government established the Interim Planning Guidelines for the section of the Moraine lying within the GTA. It also appointed a multi-stakeholder Technical Working Committee to "develop a long-term strategy for the protection and management of the ecological integrity of the Oak Ridges Moraine." In April 1994, the Technical Working Committee circulated a draft for public discussion entitled *The Oak Ridges Moraine Strategy for the GTA*. The suggested strategy would eliminate the short-sighted piecemeal planning decisions that were gradually destroying the moraine. Having received the committee's final report, however, the provincial government has taken no specific action on it.

In 1993, the Ontario Ministries of Environment and Energy and Natural Resources unveiled ecosystem planning based on watersheds. The province's Conservation Authorities were seen as the natural units for implementing such an approach because their jurisdiction is based on watersheds and, therefore, cuts across municipalities. Unfortunately, this initiative has not progressed substantially since that time, at least partly due to the fact that funding for Conservation Authorities in the province has been drastically cut. We recommend that the province restore funding for Conservation Authorities and give them an explicit mandate to lead ecosystem planning exercises throughout southern Ontario. In northern Ontario, ecosystem-based planning should be carried out through joint municipal action and supported by MNR.<sup>36</sup>

Ontario also has considerable experience in ecosystem planning based on terrestrial landform (rather than watershed) units. The oldest of these is the Niagara Escarpment Commission, a provincial agency with a mandate to protect the unique ecological features of the escarpment, oversee development in the municipalities that overlap the escarpment, and monitor ecosystem changes throughout the escarpment. Even though the commission is considered a model of ecosystem planning around the world, the present provincial government seems to be intent on undermining the commission's effectiveness; its budget has been reduced by 40 percent, reporting responsibility has been moved from the Ministry of the Environment (with a protection mandate) to the Ministry of Natural Resources (with a resource exploitation mandate), and the government is considering downloading authority for development approval to local municipalities. We recommend that these changes be reversed and that the downloading plans be abandoned. Another, more recent example of terrestrial ecosystem planning is provided by the provincially-led planning process on the Oak Ridges Moraine, straddling the northern edge of Toronto. We recommend that this ecosystem plan, which has not been implemented by the present government, be immediately brought into effect.

#### **Agricultural Land Protection, Quebec**

The plain around Montreal, especially to the south, is the most important agricultural area in Quebec. By the 1970s, however, serious problems had arisen in the farm economy of the region: farmers were avoiding long-term investments, much land was being taken out of production or converted to urban use, and production was only a fraction of its potential. As the primary culprit, studies pointed to the leapfrog, low-density residential development in the suburban regions of Montreal, and the speculative activities of developers.<sup>1</sup> In response, the province passed *The Protection of Agricultural Land Act* in 1978 in order to ensure a permanent, strong agricultural base in Quebec. The Act established an agricultural zone where it would be prohibited to subdivide or use a lot for non-agricultural purposes without authorization from the Commission for the Protection of Agricultural Land. The commission receives about 4,000 requests per year. About 80 percent of the requests come from private developers, and 80 percent of those are refused. Thus, the Act has reduced development pressures by dampening land speculation.<sup>1</sup>

#### **Create an Ecological/Agricultural Land Reserve**

Rural areas in Ontario are not seen as permanent landscapes. Rather, they are seen as blank slates waiting for development. Urban containment boundaries will help preserve rural areas from

urban expansion, but valued rural areas need to be positively designated as permanent landscape features in their own right. Several Canadian provinces have agricultural land reserves that serve to protect the rural character of land outside rapidly growing urban areas and help to deflect growth pressures away from agricultural land into existing settlements, a dynamic that not only preserves rural areas but helps intensify urban areas. Ontario should consider the creation of an agricultural/ecological land reserve system that would serve this purpose.

### **Retrofit Existing Suburban Developments**

With half of the population living in automobile-dependent neighborhoods, we can hardly afford to write-off the suburbs as an environmental lost cause.

One of the biggest challenges in realizing more sustainable cities and towns will be the gradual

transformation of existing low-density suburbs into more sustainable urban forms. Transforming the suburban arterial into a higher-density, mixed-use Mainstreet is one way of gradually retrofitting suburban communities. Such a transformation would provide a better sense of community by offering places for social interaction; it would improve safety by increasing the casual surveillance of people on foot by apartment dwellers and in slow-moving vehicles, and it would reduce the need for cars by bringing a healthy work and home environment to the same community. Mainstreets can be encouraged through a number of government actions: public education campaigns that dispel fears about higher density, more urban environments in suburban contexts and that promote the positive aspects of more compact and varied urban forms, government-sponsored demonstration projects, and changes to municipal official plans that permit higher-density mixed use development on arterials designated for mainstreeting.<sup>37</sup>

#### **Suburban Retrofit, Etobicoke, Ontario**

The Metropolitan Toronto planning department was one of the originators of the Mainstreet concept for suburban retrofitting. The idea is to invigorate suburban mainstreets, which are often pocked by parking lots, strip malls, and vacant areas, by adding residential and other uses to create a continuous, higher-density streetscape. In the former municipality of Etobicoke (now incorporated into the new City of Toronto), an eight block section of Lakeshore Boulevard has been the subject of intense study and new development activity. The project will provide for a better living environment, a more attractive environment for pedestrians and bicyclists, and enhanced retail activity. A supportive local population has been intimately involved in the planning and design of the area and in identifying the type of economic development that will best meet community needs.

### **Ensure Aggregate Extraction is Sustainable**

The province needs to tip the scale in favour of communities that host aggregate extraction operations by:

- ensuring that the cumulative effect of aggregate production operations are addressed during the planning stages, and where plans have been developed using cumulative impact assessment, ensuring their implementation;
- requiring that comprehensive monitoring and contingency plans must be submitted and regularly reviewed by the MNR (in contrast to the current sporadic auditing system);

- assigning an independent aggregate commissioner to ensure that the Ministry of Natural Resources is following through with the review of yearly compliance reports and that the enforcement of provincial standards for the *Aggregate Resources Act* are carried out;
- re-instating all of the MNR's funding so that it may operate with sufficient resources to ensure that the aggregate industry remains accountable to the communities of Ontario;
- giving additional legislative teeth to the Natural Heritage and Water Quantity and Quality sections of the Provincial Policy Statement (under Section 3 of the *Planning Act*) so that communities and their ecosystems are not compromised by the Aggregate Resources section;
- creating stakeholder processes to give communities more control over environmental equity issues such as the sunsetting and rehabilitation of aggregate extraction operations;
- investigating new technologies that can optimize the recycling of asphalt and ways of road-building that use less aggregate, thereby reducing the demands on this natural resource;
- reinstating the Niagara Escarpment Commission's funding and creating a new process for choosing commissioners that involves the communities;
- leading a co-operative effort to have the Geological Survey of Canada conduct extensive mapping of the deep, unknown water channels of the Oak Ridges Moraine and assign the Greater Toronto Services Board to steward this natural resource and develop a long-term strategy to protect it; and
- legislating that the gravel extraction licensees must post a liability bond to ensure that they remain accountable to the community during the extraction and rehabilitation processes.

### **Move to Unit Value or Land Value Taxation**

The current system of property taxation in Ontario taxes real estate according to its market value. This represents a combination of the land value and the value of the buildings on the land. Some urban economists believe that this approach to property taxation is contributing to urban sprawl. They argue that by taxing buildings we are discouraging property owners from improving their lands and increasing densities. We are also undertaxing vacant lands within the urban envelope that should be developed, effectively encouraging the land owners to maintain the land in an idle state. Market value taxation also penalizes people who live in city centres where land values are high and may encourage people to settle in outlying regions where taxes are low. Thus, taken together, market value taxation may be encouraging sprawl in a number of subtle ways.

Alternatives to market value taxation include unit value taxation and land value taxation. Unit value taxation assesses property based on physical characteristics such as the size of the lot. The larger the lot, the higher the property tax paid. Advocates of this approach claim that it is fairer than market value taxation because larger lots use more municipal services, e.g., more snow removal and road maintenance in front of their house, longer pipes in the ground to get past the house, and further distances for police and fire trucks to drive. Unit value taxation would discourage oversized lots typically found in suburban locations and reward residents housed on small lots in the inner city. Thus, this approach could help stem sprawl.



A land value tax would tax only the land component of real estate within urban areas. By increasing property taxes on land, we would encourage owners of vacant lots to develop them in order to generate the revenue they need to pay the taxes. The greatest incentive for development would be where land values are highest, such as near major transit facilities. The result would be to encourage higher density development throughout the urban region, and in particular in areas that are better serviced by municipal infrastructure. Outside the urban growth boundary, property would be taxed at a lower rate in order to avoid increasing development pressures on and penalizing owners of rural land.<sup>38</sup>

### **Adopt a Marginal Cost Approach to Development Charges**

Municipalities in Ontario pay for the infrastructure to support growth through development charges. These charges can be very large: in Richmond Hill for instance, a developer can pay over \$20,000 in levies per housing unit. Thus, the method by which these charges are calculated can have significant impact on the location and density decisions of developers. These charges need to be redesigned in order to support land use planning goals. Most importantly, the province should encourage municipalities to adopt a marginal cost approach to development charges that would reduce charges on development projects that are higher density, mixed use, near major infrastructure facilities such as transit facilities or water treatment plants, or that fill in or intensify the existing urban fabric.<sup>39</sup>

### **Transportation Systems**

A sustainable urban transportation system aims to improve the balance of transportation modes available to urban dwellers, reduce the demand for and new spending on transportation services, and to create a more efficient, less congested transportation system. The best way to achieve these ends is to increase the proportion of trips undertaken by walking, biking and public transit and to decrease the proportion of trips made and average distances traveled in single occupant automobiles. Promoting more compact, mixed use communities will go a long way to achieving these ends, but other measures that target the way our urban transportation systems are planned, funded and managed are also needed.

The province has a strategic role to play in moving from a car-based to a sustainable transportation system. At the most general level, we recommend that the provincial government reassess its spending and policy priorities in order to shift funding and policy attention away from expanding the role of the private automobile and towards supporting public transit and non-motorized forms of transport. This shift in emphasis needs to be realized in terms of increased funding for transit infrastructure, increased subsidies for transit operations, reduced spending on expansions to the highway system, better coordination between provincial investments in the transportation system and strategic land use goals, and more powers for municipalities to regulate and tax the private automobile. At the municipal level, much can be done to encourage transit and non-motorized transportation through urban design, traffic regulation, improved transit systems, and by regulating private sector employers.

### **Undertake Comprehensive Transportation Planning**

Building a sustainable transportation system entails overcoming three forms of fragmentation in transportation planning. First, there is little connection among modes of transportation in Ontario's municipalities. For instance, bicyclists may not be provided with secure places to leave their bikes when they want to get on buses or switch to walking, bikes are sometimes not permitted on buses, and buses don't necessarily connect with trains or airports. This reinforces automobile dependency by reducing the convenience of alternative options. Thus, municipalities should improve intermodal integration, including park-and-ride, bike-and-ride, and transfer facilities with intercity bus, rail and air travel. Secondly, in urban regions that cover several municipalities, transportation planning is not only fragmented across modes of transportation, but across municipalities: several independent transit systems may be servicing the same urban region without integrating fares or schedules. Municipalities in the same urban commutershed need to ensure intermunicipal fare and service integration, especially in large urban areas, and eliminate barriers to cross-boundary transit services. Thirdly, there is often little coordination between provincial decisions on investing in transportation infrastructure and the strategic land use goals at the municipal level. In the future, the provincial government should carry out impact assessments on the land use patterns that are likely to result from major transportation investment decisions and should ensure that these impacts are compatible with municipal land use plans.

### **Reduce Need for New Road Capacity**

We recommend that transportation planning agencies in Ontario, at both the provincial and municipal levels, shift their planning philosophies from supply management to demand management. Supply management is characterized by the assumption that demand for car-based infrastructure such as roads, bridges, tunnels, and parking lots will increase and that the role of a transportation department is to expand facilities in order to meet this demand. Demand

### **Comprehensive Transportation Planning, Ottawa-Carleton, Ontario**

The Regional Municipality of Ottawa-Carleton has adopted a new Transportation Master Plan based on the principles of sustainable transportation. The Plan is designed to increase the quality and use of environmentally-friendly travel options – walking, cycling and public transit – while decreasing dependence on the private automobile. Specific objectives have been set for each mode, e.g., transit to increase from 15.2 percent of peak hour trips to at least 20 percent by the year 2021. The plan attempts to shift modal shares away from the private automobile by reducing peak hour demand for automobile travel, eliminating or shortening trips, and encouraging walking, cycling and transit use. Trip reduction will be achieved through transit-friendly site design, removing barriers to home employment, reducing subsidized parking, and by providing employers information on launching trip reduction programmes for their employees. Walking will be encouraged by providing sidewalks on all roads in the urban area and by adopting pedestrian-friendly design practices. Cycling will be promoted principally by implementing an extensive network of cycling facilities on regional roads. Transit will be encouraged through improvements to the region's transit facilities and services.

management shifts the emphasis from meeting demand to managing it in order to minimize the need for new investment in car-based infrastructure. Techniques of demand management that could be adopted by municipalities in Ontario include:

- instituting high occupancy vehicle lanes and transit-only lanes;
- restricting car access to certain areas of the municipality, e.g., downtown shopping areas;
- reducing speed limits on city streets; and
- implementing traffic-calming measures (such as speed bumps and one-way mazes) on residential side-streets.

### **Improve the Attractiveness of Non-Motorized Transportation**

Municipalities should make their road system and public areas more attractive to pedestrians and bicyclists. Measures could include:

- creating bicycle lanes on municipally controlled streets;
- improve the walking environment, e.g., by installing pedestrian crosswalks, pedestrian-initiated signal changes at major intersections, requiring shop keepers to install awnings on commercial streets, limiting the height of buildings to prevent wind tunnels and shading, adding trees, flowering plants, shrubs, etc.;
- installing bike racks on sidewalks and outside destinations such as shopping and entertainment areas; and
- prohibiting the construction of new strip malls.

### **Eliminate Automobile Subsidies**

Many people choose to use their cars instead of public transit because subsidies to car use make it relatively cheap to use a car once the initial investment in purchasing the car is made. The province can help level the

#### **Pedestrianization, Perugia, Italy**

The growth of car traffic in Perugia, Italy was causing serious air pollution, with the associated health problems and threats to the city's built heritage. The city's transportation plan introduced measures to promote walking, including the development of a pedestrian network, which was built with municipal funds. The network was developed by establishing a pedestrian zone in the historic centre, establishing controlled traffic zones, and creating mechanized pedestrian ways, including escalators, elevators and pedestrian walks of special design. There has been a high degree of acceptance, as seen by the demand for extensions to the system. Motorists can leave their cars in parking lots on the periphery of the central area and enter the pedestrian network.

#### **Gas Tax, Greater Vancouver Regional District, B.C.**

According to provincial legislation, municipalities in British Columbia can ask the provincial cabinet to impose a special tax on gasoline. In the GVRD, the province has collected a gas tax since 1980 (currently 4 cents per litre of gasoline or diesel). The revenues raised by the tax are used for transit investments in the GVRD. The gas tax currently raises about \$80 million a year, which represents about 23 percent of the total transit budget in the GVRD (not counting expenditures on debt servicing). The money has been spent exclusively in the GVRD on both capital projects such as the Sky Train and on operating expenses. Responsibility for transit planning in the GVRD is now being devolved from the province to a new locally-controlled Greater Vancouver Transportation Authority (GVTA). The responsibility for collecting and spending the revenues from the tax on gasoline (which will be increased to 8 cents per litre in 1999) will move to the GVTA. The new authority will also be permitted to impose a yearly vehicle tax, which may vary according to engine size, emission levels or car mileage.

playing field by changing legislation governing the insurance industry to encourage distance-based premiums and by charging distance-related tolls on provincial highways.<sup>40</sup> Provincial car registration fees should also be based on vehicle use rather than the current flat rate structure. Changes to the *Municipal Act* should be made permitting municipalities to raise revenues from different funding sources such as increased car registration fees, gas taxes, toll road charges, parking taxes for commercial and industrial property owners, and the reallocation of road-building funds. Revenues from adopting these measures can then be used to subsidize new transit investments and operations. Municipalities can help by requiring employers to eliminate free parking or cash out free parking by offering an equivalent value in the form of transit tickets, and by reducing rates in municipally-operated parking lots for multi-passenger vehicles.

### **Increase Transit Subsidies**

Until subsidies that support automobile use are completely removed, we will need to continue funding for improved public transit in Ontario if it is to compete with the car in terms of cost and convenience to the user. Therefore, it is essential that the province restore funding for municipal transit operations and for GO Transit. However, it is important that transit subsidies be structured so as to target specific markets in order to maximize the positive impact on ridership. Transit agencies should be required to submit proposals on how they would use new money to attract new riders. European experience with environmental tickets suggests that very low-priced passes for frequent users such

as students and the elderly can increase ridership up to 30 percent.<sup>41</sup> Ontario should also consider supporting a fare free zone in central business districts as a way of enticing urban drivers to use transit.

#### **Road Pricing, Edinburgh, Scotland**

The City of Edinburgh plans to introduce Britain's first road-pricing scheme. If the plans go ahead, motorists will pay \$4 at a tollbooth (or have the charge applied via a roadside microwave scanner) as they enter the city. Alternatively, motorists may leave their cars in a secure car park and continue their journey into the city by cheap, high speed trains and buses. In the five years leading up to the scheme's launch, the City will borrow from the private sector to improve public transport and re-open an abandoned railway line, financing the loan from future toll incomes. Edinburgh is also planning to build 121 car-free homes with no roads, no parking spaces and no garages. The homes will be located on a redeveloped railway yard, which is 2.5 km from the city centre. A municipally-run car club, to which residents must belong, will maintain a fleet of cars on site for residents to use.<sup>1</sup>

### **Make Public Transit More Attractive to Users**

Transit systems need greater subsidies from the provincial government, but local transit operators can also contribute to improved convenience and lower transit costs. Possible measures include:

- improving transit shelters to protect users from the elements;
- charging transit users according to distance traveled;
- convincing sponsors of major events to include a transit ticket in the price of admission;
- using smaller buses, vans, or taxis in lower-density suburban locations;
- instituting reserved lanes and priority signalization for transit vehicles;
- encouraging public transit providers to improve storage areas for bulky items that are transported by passengers, i.e., large shopping items, bicycles etc.; and

- reforming the tax system so as to make employer-provided transit passes a non-taxable benefit to employees and a deductible expense for employers.

### **Promote Trip Reduction**

Municipalities should use their legislative powers to require major employers to act in ways to reduce car use. Trip reduction bylaws are designed to reduce single-occupant vehicle trips taken by employees of larger firms. The bylaw usually requires that such firms designate a transportation coordinator and submit a trip reduction strategy to the municipality. To have the intended effect, these bylaws require that the municipality establish a monitoring and enforcement system, such as fines for recalcitrant firms and individuals. The provincial and municipal governments in Ontario can also lead the way for other sectors by adopting strategies that reduce the need for commuting, especially single-occupant commuting, among their own work-forces. Such strategies could include:

- promoting proximity commuting by offering employees the opportunity to work in offices or other locations closer to their homes;
- encouraging telecommuting by allowing some employees to work part-time from home using phone, fax, and e-mail links to the office and clients;
- facilitating teleconferencing by encouraging employees to conference with each other and municipal clients over the phone or by using computer-aided videoconferencing technology; and
- encouraging car pooling by setting up information boards, and providing employees with incentives such as reduced parking fees, and preferred parking spots.

#### **Telecommuting, San Diego, California**

The City of San Diego now has a permanent telecommuting program, with 35 employees participating, and 500 telecommuters expected within five years. This represents over 5 percent of city staff, excluding police officers. City departments reimburse employees for phone calls, required software and modems. Only about one-tenth of a full-time administrative position is needed to maintain and expand the program. After start-up costs, the program broke even within three years, and direct benefits outweighed costs five to one. Direct benefits included increased employee effectiveness, decreased sick leave, decreased turnover, reduced parking requirements, and office space savings. Commuting costs and time were also reduced. The average commute of only 550 km/year (about 11 km per week) results in a savings of over \$350/year in vehicle operating costs and often reduces employees' need for a second vehicle. Vehicle emissions for telecommuters were reduced by 63 to 73 percent on telecommuting days.

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**A SUSTAINABLE FOOD & AGRICULTURE AGENDA  
FOR ONTARIO**

By Rod MacRae & Vijay Cuddeford

Prepared for

The Environmental Agenda for Ontario Project

March 1999



## SUMMARY

### **Current Status**

Three main concerns drive interest in a more environmentally and economically sustainable food and agriculture system: that our present agricultural, processing and distribution practices are having a negative impact on environmental quality, and on resource availability and use; that these practices are contributing to a deterioration in human health; and that the economic situation for farmers and rural communities continues to decline, making it more difficult for them to practice environmental stewardship.

The negative environmental impacts of current food system practices include soil degradation, water depletion and contamination, inefficient energy use, loss of plant and animal genetic diversity, negative impacts on non-target organisms, and destruction of non-agricultural habitat. Certain products and practices are implicated in human health problems, including animal antibiotic use leading to antibiotic resistance, growth hormones for livestock, nitrates in groundwater, pesticide exposure in occupational settings, pesticide residues in foods, many food additives, and certain food processing techniques.

### **Causes of Problems**

Economic power is increasingly concentrated in the hands of fewer and fewer economic players. Canada has the most oligopolistic economy in the Western World. Such economic power is antithetical to environmental stewardship on the part of both farmers and agribusiness. In addition, it is linked with reduced farm payments, higher farm input costs, and higher retail prices for consumers. As a result, many farmers are caught in a cost/price squeeze, and the numbers of farms and farm operators declines. In this economic climate, it is difficult to invest in the environment. Given their oligopolistic position, most agribusiness firms have little competitive motivation to be environmental stewards or to provide environmental products to the market place. The problem is compounded by the absence of readily accessible information for consumers about the environmental qualities of the products available.

In general, the provincial government's actions in the agriculture and food sector are accelerating the pace of environmental degradation and financial instability for farmers. Their agenda is characterized by cuts, deregulation, privatization, pro-development initiatives, supports to export at the expense of the local food economy, support for traditional models of competitiveness, biotechnology promotion rather than sustainable agriculture, limiting of public input, and helping to make conventional agriculture more efficient. Very little of this is supportive of an environmental agenda in the food and agriculture system.

### **Agenda for Change**

Sustainable agriculture is perceived in many circles to provide solutions to most of the problems described above. Sustainable production systems substantially reduce erosion and surface and

groundwater contamination, principally due to the use of sophisticated crop rotations and organic matter management techniques. The use of toxic materials in production is very low in comparison to conventional systems, so the environmental and health problems associated with their use do not occur. Depending on the region and production system, energy use in sustainable systems can be reduced by up to 60%, primarily due to reduced use of agrochemicals. Diversified crop production systems, windbreaks, and the more diversified landscape associated with sustainable agriculture systems often contribute to improved and varied wildlife habitat.

Sustainable agriculture is economically viable, and can help farmers deal with many of the economic pressures they are currently facing. There is a growing market for the products of sustainable agriculture. For example, it is estimated that organic foods presently account for about 1% of the Canadian food market, and that this share is growing by 15% per year.

### **Key Recommendations**

The recommendations in this report provide directions to provincial staff on what activities should be considered priorities. Some allow the province to provide guidance to the private sector. Others are designed to shift subsidies from less sustainable activities to more sustainable ones. Here are some key recommendations that we urge the provincial government to adopt:

#### *Immediately:*

- Re-define Bill 146, to focus on the local/environmental/economic "reasonableness" and necessity of farming practices, rather than "normalcy". Re-focus the bill on preservation of agricultural land, not preservation of agricultural practices. Balance the rights of farmers to conduct environmentally sound farming with the rights of municipalities to regulate agricultural activity.

#### *Longer term:*

- Develop subsidy, credit, extension and marketing programs to support the transition to sustainable practices (particularly organic farming) as is practiced now in most European nations.
- Set up a policy framework for combinations of the following measures to protect agricultural land: land trusts, conservation easements or agreements, transfer of development credits or cross-compliance in program criteria. The Green Door Alliance's recommendations for land use and preservation of the federal and provincial lands to the northeast of Toronto provide a model for flexible implementation of a variety of measures. When considering agricultural land for preservation, specialty cropland should have the highest priority for preservation, followed by Class I to Class IV, in descending order.
- We also recommend that environmental groups facilitate the development of eco-entrepreneurial projects with the private sector, as well as brokering projects between institutions and progressive farmers to strengthen local food systems.

Authors:

Rod MacRae is the coordinator of the Toronto Food Policy Council and a consultant on sustainable food and agriculture policy. Vijay Cuddeford also consults to the environmental and international NGO community on sustainable agriculture, with extensive knowledge of the negative environmental impacts of pesticides on the environment.

Acknowledgements:

The authors wish to thank the following people who provided very helpful comments on earlier drafts of this paper: John Bacher (Preservation of Agricultural Lands Society), Helen Forsey, Bob Fugere, Bob Gibson, Ziggy Kleinau (Citizens for Renewable Energy), Silvia Langer (Greenest City Program), Richard Lloyd (National Farmers Union), Mark Muller (Institute for Agriculture & Trade Policy), Janine Ralph, Katrina Simmons, Elizabeth Wharton (Pesticide Action Group), Mark Winfield (Canadian Institute for Environmental Law and Policy).





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## A GREEN FOOD & AGRICULTURE AGENDA FOR ONTARIO

### ENVIRONMENTAL PROBLEMS AND THEIR EFFECTS

Three main concerns drive interest in a more environmentally and economically sustainable food and agriculture system: that our present agricultural, processing and distribution practices are having a negative impact on environmental quality, and on resource availability and use; that these practices are contributing to a deterioration in human health; and that the economic situation for farmers and rural communities continues to decline, making it more difficult for them to practice environmental stewardship.

The negative environmental impacts of current food system practices include soil degradation, water depletion and contamination, inefficient energy use, negative impacts on non-target organisms, loss of plant and animal genetic diversity, and destruction of non-agricultural habitat. Certain products and practices are implicated in human health problems, including animal antibiotic use leading to antibiotic resistance, growth hormones for livestock, nitrates in groundwater, pesticide exposure in an occupational setting, pesticide residues in foods, many food additives, and certain food processing techniques, such as removal of fibre from grains, addition of salt, refined sugar, and boiling in fat, oil or water. Although considerable scientific controversy remains, there is some evidence to suggest that conventional soil management practices are contributing to declining nutritional value in foods.<sup>1</sup>

Financial health is critical to environmental improvements in the food system. When farmers are under severe financial pressures, as many currently are, it is very difficult to effect environmental improvement.

The economic environment of Ontario's food and agriculture sector is presently unfavourable for environmental stewardship. Approximately 30% of Ontario farmers rely on off-farm income to survive financially. While the capital value of farms has not changed from 1991 to 1996, total outstanding farm indebtedness has risen by 8.5%. Between 1992 and 1996, farm cash receipts rose by 8.3%, but farmers' total net income fell by 41.6%, largely as a result of a 12.5% increase in farm operating costs after rebates.<sup>2</sup> Between 1992 and 1996, total fertilizer costs rose by 23%, pesticides by 20%, and commercial feed costs by 32.5%. Total gross farm receipts measured in 1995 constant dollars actually decreased by 39% between 1981 and 1996. Only 70 % of farm acreage is owned by farmers; in some important agricultural areas, including Niagara Region (64%), Brant County (64%), York Region (44.5%) and Essex County (56%), the figures are even lower.<sup>3</sup> Tenancy often increases financial insecurity and reduces farmers' ability to be good stewards.

The total Ontario rural population fell by 2% between 1991 and 1996; total farm rural population is estimated to have fallen by 2.2%<sup>4</sup>. The total rural population fell by 6% in Niagara, 8% in Ottawa-Carleton, 20 % in York Region, and 23% in Peel and Durham regions<sup>5</sup>. Such declines

are often associated with loss of rural economic vitality and are a further indicator of financial difficulties for farmers.

Economic power is increasingly concentrated in the hands of fewer and fewer economic players. Canada has the most oligopolistic economy in the Western World. Corporate concentration exists in most sectors of the Canadian food and agriculture system, especially in fruit and vegetable canning, frozen fruit and vegetable processing, confectionery, soft drinks, biscuits, and distilleries and breweries.<sup>6</sup>

Many aspects of corporate concentration are inconsistent with environmental improvement. For example, corporate concentration has been linked with reduced farm payments, higher farm input costs, and higher retail prices for consumers. As a result, many farmers are caught in a cost/price squeeze, and the numbers of farms and farm operators declines.<sup>7</sup> Consumers are paying more, but this extra money has not been passed on to farmers. In fact, the percentage of the consumer dollar going to farmers has been declining for many years, and is now only 30 percent on average.

A related problem is the reduction in diversity associated with the elimination of farms, concentration of farm units, and the decline in the numbers of agriculture-related businesses operating in different regions of the country. According to Statistics Canada, while 91% of Ontario farms were family or individually owned in 1976, the number dropped to 57% by 1996.<sup>8</sup> The number of farms in Ontario decreased by 2.2% from 1991 to 1996, while total farm acreage increased 2.8%. Average farm size increased by 4.9%, with larger numbers of small farms, fewer medium-sized farms, and many more large farms.<sup>9</sup> Statistics Canada reports that there were 50,000 dairy farms in Ontario in 1951, but only 8,320 in 1996. The average number of pigs on a pig farm climbed from 103 in 1976, to 310 in 1991, to 418 in 1996.<sup>10</sup> These figures indicate a significant amount of farm consolidation, meaning that economic pressures are forcing many farms out of business, or into purchase by their neighbours.

The loss or consolidation of farms has had a negative impact on rural population, business and social activity, although some communities have managed to adjust to changes in the agricultural sector and have retained their vibrancy.

Government policy has in recent years consistently favoured the largest players in agriculture. In farming, this is evident in government support for intensive livestock operations. Huron County has seen an influx of large-scale, intensive hog operations; the evidence of environmental and health problems resulting from such operations continues to mount (see below). In the Processing, Distribution, and Retail (PDR) sector, government favouritism is evident in the continuing supports through grants and other government support mechanisms for the largest players in these sectors (see discussion under biotechnology).

With regard to reductions in the number of businesses, there are only half as many establishments in the food and beverage-manufacturing sector as there were 30 years ago. Much of the concentration in the food sector has come about as a result of the cascading and progressive takeover or elimination of smaller, local, regional and national firms by multinationals. These large firms are able to maintain their dominance, and hence limit diversity, by creating an environment unsuitable for new entrants. Employment in the food system has been reduced as a result of oligopolistic activity.

In this economic climate, it becomes more difficult for environmental stewardship to be practiced, and the resulting environmental impacts are severe. More specifically, the food and agricultural system in Ontario faces the following significant problems:

### **Loss of agricultural land**

To put our discussion of the loss of agricultural land in context, it should be understood that although only 11% of land in Ontario is prime agricultural land (Class I to IV soils), 50% of Canada's Class I soils are in Ontario<sup>11</sup>. The importance to farmers of preserving prime agricultural land is emphasized by the following statistic: given the same agricultural inputs, Class I land will produce 100 bushels of corn, while Class IV land will produce 49 bushels<sup>12</sup>. Simply stated, we must preserve prime farmland, because farmers cannot cover their costs when producing on poor land.

Foodland preservation also helps consumers, by reducing Ontario's dependence on imported farm produce. The securing of the farm resource base enhances the potential for greater agricultural self-sufficiency, an important element of an economic development strategy based on the principles of sustainable development.<sup>13</sup>

The position of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) is that, since the Foodland Guidelines were put in place in the late 1970s, Ontario has limited its agricultural land losses to about 2% of agricultural land per year. However, if not for the actions of several municipalities who have designed official plans with real concern for protecting agricultural land, this loss could have been much worse.<sup>14</sup> As it is, a 2% loss per annum adds up to a 33% loss over 20 years. Most official plans still do not conform to the 1977 Foodland Guidelines; no official plan has been adopted in Peel or York. Comparing provinces across Canada, Ontario has consistently converted the highest amount of prime agricultural land by area and by percentage of all converted land to non-agricultural uses. While 70% of all agricultural land converted to non-agricultural uses in the 1970s in Ontario was Class 1, 2, and 3 land, this figure had risen to 85% by the mid-90s, in spite of the Foodland Guidelines.<sup>15</sup> A perhaps typical Southern Ontario example is the city of Brampton. In 1987, the city of Brampton included 23,513 acres of agricultural land (virtually all of it Class I, II or III). The official plan calls for preservation of only 5,835 acres of that land until the year 2021. This represents an average conversion rate of 520 acres of prime agricultural land per year to non-agricultural uses.<sup>16</sup>

### **Unnecessary Application of Pesticides**

According to the May 1998 inventory of the Canadian Pest Management Regulatory Agency (PMRA), there are 7,516 registered pesticide products in Canada. As examples of excessive product differentiation in the market, there are more than 200 products registered for control of flea beetles, more than 150 for control of the Colorado potato beetle, and more than 100 for tarnished plant bug.<sup>17</sup> Pesticide costs to Ontario farmers rose by 20% in absolute terms from 1992 to 1996, and pesticide costs as a percentage of total farm expenditures rose 10% in the same period.<sup>18</sup> Total pesticide expenditures have risen 115% from 1981 to 1996, according to Statistics Canada.<sup>19</sup> Pesticide product differentiation has not served to reduce pesticide costs or improve effectiveness, given that for many of these products pest resistance is on the rise. In some cases, having a range of products available has delayed development of pest resistance, but rotating pesticides is a limited and inevitably ineffective strategy for dealing with this problem.

The magnitude of pesticide use in Ontario is enormous. In 1993, Ontario farmers applied 6,246,442 kg of pesticide active ingredient.<sup>20</sup> This figure does not include the so-called inert ingredients in pesticides, which, in some cases, make up the bulk of the weight of the pesticides, and cannot be assumed to be toxicologically insignificant. According to Statistics Canada, there were 67,520 farms in Ontario in 1995. Of these farms, 49.4% used herbicides, 16.9% used insecticides, and 9.5% used fungicides. Total acreage treated with herbicides in Ontario was 4,929,995 acres or 35.5% of all farm acreage; with insecticides, 918,791 acres or 6.6%; and with fungicides, 451,899 acres or 3.3%.<sup>21</sup>

Evidence links exposure to common pesticides with a great variety of human health disorders. Illnesses or conditions include: brain cancer, neuroblastoma, neurological disorders, immune system dysfunction, asthma, allergies, infertility, miscarriage, and reproductive disorders including hormone disruption, breast, ovarian and testicular cancers, and lowered sperm counts. Protracted impairment of neurophysiological and psychological functions has been documented. Studies have found that persons who die of cancer have statistically higher levels of chlorinated pesticides in their blood. Home use of chemicals has been linked to brain cancer, neuroblastoma and leukemia. There is a wealth of evidence suggesting that pesticide exposure causes infertility problems in men and women. One study found that men experiencing infertility problems were 10 times more likely than a control group without fertility problems to be employed in agricultural or other pesticide-related jobs. Exposure to the extremely commonly-used pesticide Chlorpyrifos (Dursban) was found to cause increases in auto-immune antibodies. Auto-antibodies are renegade immune system components that mistakenly attack the person's own body. A study of exposure to the now largely banned chemical Chlordane documented "protracted impairment of neurophysiological and psychological functions", and victims of organophosphate poisoning showed significant deficits in neurophysiological functioning.<sup>22,23</sup> Other documented risks from pesticide exposure include a four-fold increased risk of early-onset Parkinson's disease, decreased physical stamina, short-term memory impairment, a doubling of stillbirths due to congenital abnormalities, and a host of birth defects, especially limb-reduction.<sup>24,25</sup> This brief summary represents a tiny sampling of the voluminous literature on the topic.

### **Decimation of Natural Enemies, Pollinators and Other Non-target Organisms**

A majority of agricultural pesticides registered in Canada and used in Ontario are toxic to bees and other pollinators, agriculturally beneficial predatory and parasitic organisms, fish and aquatic organisms. Many are also toxic to birds.

Agricultural pesticides can have devastating impacts on natural pest control. Biological control experts estimate that 99% of pest populations worldwide are stabilized by the actions of natural enemies, i.e., predatory and parasitic insects and other invertebrates.<sup>26</sup> Pesticide use often destroys this ecological balance, decimating beneficial populations, and allowing previously innocuous creatures to reach pest status. Biological control experts suggest that the majority of the pests worldwide, on whom billions of dollars and millions of research-hours are spent, are the result of this kind of chemically-induced disruption. Pesticides often devastate vital pollinator species: it has been calculated that, in the US, economic losses due to reduced pollination and loss of honey from pesticide damages total about \$135 million per year.<sup>27</sup>

Despite knowledge of the disruptive effects of pesticide use, the practice of pest management, and the vast majority of the research effort, continues to focus on more efficient chemical control. And despite the proclamations of government bodies that they are officially embracing the philosophy of integrated pest management, economic pressures exerted by agrochemical / pharmaceutical multinationals routinely override environmental considerations in the pest management regulatory system. Thus, provincially-promoted IPM programs are largely focused on pest management and risk reduction through more efficient chemical use.

### **Spray Drift**

Drifting persists despite efforts to control it, and may in fact be a more serious problem than earlier because of the highly active nature of some new low dose products. For example, in the spring of 1998, Cargill sprayed a cornfield adjacent to a small business called "Uncommon Ground Perennial Gardens," which produces greenhouse-grown flowers and herbs near Wardsville in the Chatham area. Spray drift drove two pesticides into the greenhouse, and the farmers are now unable to sell their products.

### **Land and Water Contamination from Biosolids, Manures, Pesticides, Fertilizers, Application of Sewage Wastes, and Aquaculture Operations**

#### **Drinking Water**

A 1992 Ontario Farm Groundwater Quality Survey found that 37% of the farm wells tested were contaminated; 13% had too much nitrate and 31% exceeded coliform counts, suggesting possible contamination with animal manure. The study also found that one-third of the farm wells tested had detectable levels of pesticides. These contaminants are likely to have had negative human and animal health effects.<sup>28</sup>

#### **Industrial waste**

There is a big push in Ontario to apply treated urban sewage and industrial waste to agricultural land as fertilizer. This is already having horrendous effects. Paul Hernder of Hernder Estate Winery in St. Catharines is taking Noranda to court for destroying forty-three acres of his vineyards. The grapevines were devastated when Noranda paper mill sludge, which was to have

been applied to a field beside the vineland, was left sitting in storage on the farm site for several months. Nitrogen had been mixed in with the sludge, and the mixture released a toxic mist that killed all the leaves on the grapevines. The vines themselves died soon after. Herder also applied sludge on vinelands directly. The grape vines in these fields, planted about 6 years ago, are dying slowly.<sup>29</sup> Paper mill waste is also implicated in increased soil compaction from spreading operations, reduced soil tilth due to incomplete breakdown, poorer drainage, waterway contamination and exposure of cattle to toxic substances. The Ministry of the Environment has received over 1200 pages of complaints about the paper mill landspreading program in York, Durham and Victoria counties.<sup>30</sup> Because the primary purpose of sewage treatment is to extract treated water, toxic chemicals tend to concentrate in treated waste. Ninety percent of dioxins in influent end up in sewage sludge, while parasite eggs settle and are concentrated in sludge. Several characteristics of agriculture in some Ontario regions can exacerbate problems related to the agricultural application of sewage sludge. Low pH soils increase metal availability, shallow soils increase the possibility of groundwater contamination, and application of sewage sludge to lands where dairy is a major agricultural use can, with the addition of manure, lead to excessive nitrogen and phosphorus.<sup>31</sup> Inadequately fenced lands receiving sludge have resulted in livestock directly consuming paper sludge, which is implicated in animal deaths.<sup>32</sup>

### **Sewage Sludge**

The MOE's 1988 Model Sewer Use by-law contains almost no controls over the discharge of toxic organic chemicals to the sanitary sewer. As a result, persistent, bioaccumulative toxic organic chemicals are discharged into Ontario sewer systems, most of which end up in sewage sludge. These include such materials as dichlorobenzene (urinal deodorizer), benzo[a]pyrene (present in crude oil, also a by-product of the burning of organic material), hexachlorobenzene (pesticide for fungi), pentachlorophenol (wood preservative), nonyl phenols (implicated in hormone disruption) and PCBs<sup>33</sup>.

Although data is deficient because the provincial government does not require monitoring, this situation very likely renders most municipal sewage sludge unsuitable for spreading on agriculture land. Provincial rules, however, contain no such restrictions. In fact, the evidence continues to mount that, given the absence of provincial controls, municipalities and companies are using sludge increasingly on agricultural land as a waste disposal strategy. The only guidance is contained in the 1996 Provincial document entitled "Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land." These Guidelines show no limitations on the amount of toxic organic compounds allowed in sludge. Paradoxically, the document acknowledges, "There are significant gaps in knowledge with respect to the fate of organic contaminants in biosolids applied to land...As experience is gained and relevant research results reviewed standards will be established" (page 8).

### **Intensive Livestock Operations**

Intensive livestock farming has come to Ontario, particularly in the swine industry. Huron County has become a centre for intensive hog operations and the battlelines are being drawn with municipalities, environmentalists and health professionals on one side, and conventional agriculture and OMAFRA on the other. A March 1998 report on water quality in the County suggests that animal operations are contributing significantly to reductions in rural water quality.



Particularly disturbing is the presence of antibiotic resistant bacteria in streams and on beaches. Much of this resistance, given the nature of bacteria and the patterns of resistance, likely is coming from animal operations.<sup>34</sup> Antibiotic-resistant bacteria are a concern because they are more difficult to treat when humans are infected.<sup>35</sup>

OMAFRA is attempting to muzzle the damaging implications of the water quality report. Although septic systems are contributing to the problem, the Ministry is having the report rewritten to claim that most of the problem is associated with faulty septic systems. A local Huron County environmental group launched a lawsuit against the Ontario pork industry, OMAFRA and the MOE, claiming these bodies have failed to act to protect the public's health.

Collingwood, Sault Ste Marie and Thunder Bay have experienced boiled water alerts due to the bacterium cryptosporidium. Although some believe this problem to be associated as well with animal agriculture, it is not entirely clear the extent to which it has been a factor in these cases. Problems with intensive livestock farming are better known south of the border. In 1993, 400,000 people were sickened and 100 people died in the state of Wisconsin from an intestinal virus linked to cryptosporidium, which had contaminated Milwaukee's drinking water supply. This parasite lives in the intestinal tracts of humans, cattle and other animals. It is thought that cryptosporidium entered the water supply through runoff from livestock operations. "While this disease is usually self-limiting in immunocompetent calves and humans, it can be prolonged and life-threatening among immunocompromised people such as AIDS patients since an effective treatment for eliminating this parasite from the gastrointestinal track still does not exist."<sup>36</sup>

In North Carolina and the Chesapeake Bay area, runoff from livestock operations is a prime suspect in the huge fish kills in both areas. In 1995, up to 10 million fish were killed in North Carolina, while in 1991 up to 1 billion fish were killed. As well as fish kills, there were injuries to fishermen and water skiers in Chesapeake Bay.<sup>37</sup> The cause of fish death is presumed to be an outbreak of *Pfisteria*, a predatory microbe linked to the spreading of chicken manure on farm fields. This manure is created in huge quantities by large poultry operations in the vicinity of both regions. A number of states in the US are bringing forward legislation and policy to restrict the expansion of large livestock operations.<sup>38</sup>

Farmers live and work on 90% of the lands that serve as groundwater recharge areas. Agriculture is a major water user. Conflicts are also emerging between farmers and municipalities over water use, particularly livestock and irrigation operations. Other problems associated with intensive livestock operations include objectionable odours and declining land values.

### **Aquaculture**

In 1996, the Ontario aquaculture industry produced approximately 4,240 tonnes (9.35 million pounds) of rainbow trout from over 200 licensed facilities. By the year 2000, industry hopes to increase this output by 65%. Most fish farms are located in southern and central Ontario, but there has been recent expansion into northern Ontario, particularly in the North Channel area of Georgian Bay near Manitoulin Island. Since the mid 1970's, the industry has steadily moved towards highly intensive production systems, high fish stocking densities and maximal water

usage. Regulation of Ontario aquaculture is managed by a maze of different provincial and federal bodies, including the provincial ministries of Environment, Natural Resources, Municipal Affairs and Housing, Food, Agriculture and Rural Affairs, the federal departments of Health and Fisheries, plus municipal and conservation authorities. Environmental problems with fish farming on the Atlantic and Pacific coasts are well-documented,<sup>39</sup> and it is likely that the same issues will need to be carefully monitored in Ontario. These problems include shoreline degradation, destruction of habitat for other species, and water contamination from feces, pesticides and antibiotics.

### **Soil Erosion and Nutrient Loss**

As of 1991, it is estimated that Ontario was losing 26.38 million tonnes of soil due to erosion every year, at a cost of approximately \$500 million in farm and off-farm costs.<sup>40</sup> While a certain amount of soil erosion is arguably unavoidable, it could be minimized by less intensive and/or more appropriate cropping practices.<sup>41</sup>

### **Energy Inefficiency**

The food system in North America is highly energy inefficient.<sup>42</sup>

- In 1945 one calorie of energy input into corn production yielded 4 calories of energy output. This return diminished to 2.4 calories output for every 1 calorie input by 1979. Energy use is higher for fruits and vegetables and highest for animal products. Fruits and vegetables require 2 calories input to yield 1 calorie of output while animal proteins require 20 to 80 calories of energy input for 1 calorie of energy output.
- The food system consumes somewhere between 12 and 20% of all energy consumed.
- Up to 13% of food system energy consumption is for transportation of foods. The average food molecule in North America likely travels about 2000 km.

It is also, consequently, a major contributor to greenhouse gas accumulation.<sup>43</sup>

- Globally agriculture alone (not the entire food system) is thought to contribute 21 to 25%, 57% and 65 to 80% of total human-related emissions of CO<sub>2</sub>, methane and nitrous oxide. These gases account for 50 to 60%, 15% and 15% respectively of the total global warming potential. Emissions are primarily a product of soil management practices - excess breakdown of soil organic matter, improperly managed manure, and volatilization of synthetic nitrogen fertilizers.
- Agriculture accounts for about 6.5% of Canada's greenhouse gas emissions or about 40 million tonnes carbon dioxide equivalent. About 80% of CO<sub>2</sub> emissions in agriculture come from the combustion of gasoline and diesel oils used in agricultural machinery.
- Although cattle in Canada account for only about 11% of farm animals, they contribute 95% of the methane emissions. Methane released during storage of animal wastes accounts for 30 to 40% of emissions from animals, with liquid/slurry storage making the greatest contribution.
- Emissions from the use of fertilizers increased about 18 per cent over the period 1990 to 1995.

Agriculture will also be very directly affected by global warming. Current evidence suggests that the Earth's climate is warming; widely accepted estimates predict that the average global temperature will increase by about 0.3 degrees Celsius per decade during the next 100 years. A warming of this magnitude could significantly alter patterns of rainfall and regional drought; weather variability may also become more extreme.

Export agriculture is a major contributor to this problem of energy inefficiency. In 1997, Ontario's food imports were almost \$3 billion more than its exports, according to Statistics Canada. Between February 1997 and February 1998, exports rose 4.1%, while imports grew at a rate of 14.3%.<sup>44</sup>

### **Biotechnology**

Biotechnology has been publicly presented by agribusiness, biotechnology firms, and some policy makers as a way to create a more sustainable agriculture. They claim biotechnology developments provide a way to reduce pesticide use, increase agricultural productivity, and reduce agricultural pollution.

Pesticide reduction receives the most attention. Most of the current products on the market or in development are for herbicide-resistant and BT-crops.

Unfortunately, "biotechnology is being shaped within the same social context and value system that led to chemical dependence."<sup>45</sup> It is deeply integrated into the same industrial agricultural economy that has created many current environmental, social and economic problems.<sup>46</sup> Biotechnology seeks solutions to agricultural problems in products sold in the marketplace, rather than in management solutions that decrease farmers' reliance on external inputs or agribusiness.<sup>47</sup> Herbicide-resistance is receiving the most commercial attention "not because it is good or biologically sound, but because it is easy and profitable, involving the transformation or insertion of only one gene."<sup>48</sup>

Many current biotechnology applications will likely increase pesticide use. Some may lead to short-term reductions, but, because they reinforce the existing design of agricultural systems, will make the transition to truly sustainable strategies more difficult. For example, the recently registered BT-potato,<sup>49</sup> designed to reduce Colorado Potato Beetle damage, will likely contribute to already existing BT resistance,<sup>50</sup> and discourage farmers, at least in the short-term, from practising crop rotation. There is evidence that potatoes can only be grown on the same land once every two to four years, if pest pressures are to be minimized.<sup>51</sup> Consequently, although Colorado Potato Beetle damage may be reduced in the short-term, resistance will likely rise, as will the incidence of other pest problems that will require pesticides for control. Once resistance occurs, the variety will lose its value, and the expensive infrastructure required to create it will be wasted, imposing an opportunity cost for less expensive management strategies.

Some analysts believe that there is a significant risk of increased weediness and gene transfers to pests from transgenic plants, thus creating new pest problems that may thwart ecological

solutions and require even greater use of pesticides to solve.<sup>52</sup> Rissler and Mellon<sup>53</sup> have reviewed the literature surrounding these risks and have drawn the following conclusions:

- o That transgenic plants could acquire invasive traits that would increase their capacity to be weeds.
- o That some crops will transfer genes to wild relatives through transgenic pollen. This risk does not exist with ecologically debilitated crops such as corn, but rather those with weed characteristics and bearing close resemblance to wild relatives (alfalfa, barley, lettuce, oats, sorghum, wheat, and brassica family vegetables), and others that are already considered weeds in some circumstances (rye grass, strawberries, bermuda grass and sunflowers).<sup>54</sup>
- o That transgenic virus-resistant crops may lead to new strains of viruses, resulting in new kinds of viral infections of plants. This might occur through the transfer of genetic material from the inserted virus gene to a related virus. After the exchange, the affected virus would have a new genetic makeup.

Instead of increasing genetic diversity as many claim, biotechnology is actually reducing it, because farmers are aggressively recruited to convert to this new technology. Other varieties are being dumped in favour of genetically engineered ones. This is a continuation of a long-standing trend in agriculture of narrowing the gene base by focusing on those varieties that are heavily promoted by the seed and chemical industry.

## **THE ENVIRONMENTAL MOVEMENT'S LONG TERM VISION**

Food, air and water are the three biological requirements for life. Air and water are still treated, though not always well, as common property. Food is not. We need a sustainable food and agriculture system that has nourishment of the population and sustainability of the resource base as its fundamental objectives.

Sustainable agriculture is both a philosophy and a system of farming. It has its roots in a set of values that reflect awareness of both ecological and social realities. It involves design and management procedures that work with natural processes to conserve all resources and minimize waste and environmental damage, while maintaining or improving farm profitability. Working with natural soil processes is of particular importance. Sustainable agriculture systems are designed to take maximum advantage of existing soil nutrient and water cycles, energy flows, beneficial soil organisms, and natural pest controls. By capitalizing on existing cycles and flows, environmental damage can be avoided or minimized. Such systems also aim to produce food that is nutritious, and uncontaminated with products that might harm human health.

In practice such systems have tended to reduce or avoid the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. These substances are usually rejected on the basis of their dependence on non-renewable resources, potential for environmental disruption, and possible adverse impacts on soil organisms, wildlife, livestock and human health. Instead, sustainable agriculture systems rely on crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, and appropriate mechanical

cultivation or minimal tillage to optimize soil biological and natural pest control activity, and thereby maintain soil fertility and crop productivity. In addition, resistant varieties, and biological, biorational, and cultural controls are used to manage pests, weeds and diseases. Preventive health care strategies, such as dietary changes, increased exercise, and housing changes are employed to maintain animal health.

This description of sustainable farming encompasses a wide range of farming systems including those referred to as low-input sustainable agriculture (LISA), organic, biological, ecological, agroecological, biodynamic, regenerative, alternative, natural and permanent (permaculture). Although these systems are sustainable to differing degrees, all fall within the boundaries of the description above.

Agroecological theory also concerns itself with socio-cultural issues. Human relations and their connection with their environment are as essential to the sustainability of agroecosystems as are the other biotic and abiotic factors that constitute a farm. A central purpose of sustainable systems is to support self-reliance and viability in rural communities.<sup>55</sup> Consequently, socio-economic and political systems (or social choice mechanisms) that complement agroecological principles are sought.<sup>56</sup>

The potential of this approach, however, goes far beyond its present expression, which has largely been limited to the substitution of environmentally benign products and practices. More significant advances can be expected as a result of developments in the science and art of agroecosystem design and management

Sustainable food systems are designed to nourish the population in ways that ensure:<sup>57</sup>

- The availability of a variety of foods at a reasonable cost.
- Ready access to quality grocery stores, food service operations, or alternate food sources.
- Sufficient personal income to purchase adequate foods for each household member each day.
- Legitimate confidence in the quality of the foods available.
- Easy access to understandable accurate information about food and nutrition.

The ultimate long-term goals of a sustainable food and agriculture system are:<sup>58</sup>

- Everyone has enough food (quality and quantity) to be healthy.
- Food production, processing and consumption are suited to the environmental, economic, technological and cultural needs, potentials and limits of the distinct regions of Canada.
- The food system is seen as providing an essential service. Food supply and quality are dependable. They are not threatened by social, political, economic and environmental changes.
- Food is safe for people who produce it, work with it, eat it, and for the environment.
- Resources (energy, water, soil, genetic resources, forests, fish, wildlife) are used efficiently (in an ecological sense), and there is no waste.
- The resources of the food system are distributed in a way that ensures that those who provide the most essential tasks are provided a decent income. In particular, people in rural

communities have enough work and income to maintain or improve their life, and to care for the rural environment.

- Flexibility exists to allow for improvements and adaptation to changing conditions.
- Everyone who wants to be involved in determining how the food system works has a chance to participate.
- Opportunities are available for creative and fulfilling work and social interaction.
- The food system functions in a way that allows other countries to develop food systems with similar values.

## **SOLUTIONS TO THE PROBLEMS**

### **Sustainable Agriculture**

Sustainable agriculture is perceived in many circles as providing solutions to most of the problems described above. Sustainable production systems substantially reduce erosion and surface and groundwater contamination, principally due to the use of sophisticated crop rotations and organic matter management techniques. The use of toxic materials in production is very low in comparison to conventional systems, so the environmental and health problems associated with their use do not occur. Depending on the region and production system, energy use in sustainable systems may be reduced by up to 60%, primarily due to reductions in agrochemical use. Greenhouse gas emissions are much lower because soil becomes a more significant carbon sink, manure is better managed, and less synthetic nitrogen volatilizes into the atmosphere. Many producers use older, sometimes rare, crop cultivars and animal breeds because they find them more appropriate in their production systems. Diversified crop production systems, windbreaks, and the more diversified landscape associated with sustainable agriculture systems often contribute to improved and varied wildlife habitat.

Sustainable agriculture is economically viable and can help farmers deal with many of the economic pressures they are currently facing. Studies consistently show that farmers do at least as well financially, if not better, following the transition to sustainable agriculture.<sup>59</sup> This is primarily due to reduced input costs, and sometimes to premium prices for their products. There is a growing market for the products of sustainable agriculture. For example, it is estimated that organic foods currently account for about 1% of the Canadian food market, and that this share is growing at 15% per year. Foods produced with integrated pest management (IPM) principles are also now appearing on store shelves. The international market for organic foods is expanding at even more rapid rates. The US organic market has achieved greater than 20% annual increases seven years in a row.

### **Building Financial Health for a Diverse Group of Farmers**

In addition to direct environmental programming, it is important that programs be in place to support the financial health of most farmers. Orderly marketing, price stabilization and insurance programs, and access to credit are all arrangements that have an effect on the environment. Orderly marketing combined with supply management has worked well in several commodities and has created the most stability for farmers. It also represents the only systematic

approach to demand-supply coordination practiced in Canada, a critical long-term strategy to achieve environmental sustainability.

Such programs and orderly marketing strategies have been under siege as a result of federal government efforts to meet the demands of North American Free Trade Agreement and the World Trade Organization. Environmental and farm organizations have documented extensively how free trade contributes to environmental degradation, financial inequity, and food insecurity.<sup>60</sup>

### **Building Local Food Systems**

Partly in response to international trade arrangements, farmers, consumers and their organizations are increasingly supporting the development of local food systems. Their efforts focus on creating direct producer-consumer linkages (e.g., community supported agriculture projects [see description in section on eco-entrepreneurial activities below], cooperatives, farmers' markets, u-pick operations); supporting on-farm and microprocessing; building urban agriculture, particularly community and allotment gardens; encouraging institutional purchase of local products; and devising local labeling schemes to help consumers identify the products of local farmers (e.g., Windsor's Bounty of the County, the Renfrew Valley scheme, and Kawartha's Own, Kawartha Grown).

Combining the transition to sustainable practices with building local economic activity appears to bring additional economic and environmental benefits to communities. A North Dakota study concluded that some economic sectors would be enhanced (transportation, utilities, business services, and non-metal mining), but others would decline (construction, professional services, finance, retail trade, agricultural processing). Overall, the rural economy would suffer unless a better infrastructure for new marketing, processing and storage needs were put in place.<sup>61</sup> In particular, the absence in many communities of products and services required by sustainable farmers would mean that significant local economic opportunities would be lost in the short term unless proper attention is paid to facilitating the transition to local sustainable food systems.<sup>62</sup>

A Nebraska study of an agriculture-dependent community compared two scenarios: one where farms followed sustainable practices, and one where farms followed conventional practices. The study found that total family income more than doubled and that the property tax base was larger with adoption of sustainable practices. Less would be spent on agrochemicals, fuel, hired labour, livestock purchased for resale, seed, taxes and interest, while more would be spent on supplies, utilities, feed, veterinary expenses, charity, food and personal care products.<sup>63</sup>

Interestingly, there are also reports of improved community vitality associated with more widespread adoption of sustainable agriculture. A study of four communities in the Midwest USA found that communities with more sustainable agriculture practitioners had a greater capacity to mobilize community resources for local development. This resulted in more active participation in local government, along with the creation of new community economic development structures and new businesses. This result was attributed, in part, to the problem

solving and self-reliance skills of sustainable agriculture practitioners.<sup>64</sup> Similar economic development improvements have been attributed to areas with viable farmers' markets.<sup>65</sup>

## **ASSESSING THE ADEQUACY OF PROVINCIAL GOVERNMENT ACTIONS**

In general, the provincial government's actions in the agriculture and food sector can be summarized by the following words and phrases: cuts, deregulation, privatization, pro-development initiatives, supports to export, support for traditional models of competitiveness, biotechnology promotion, limiting of public input, and making conventional agriculture more efficient. Very little of this is supportive of an environmental agenda in the food and agriculture system. Some examples of how this agenda compromises the environment are provided below.

### **Cuts:**

- OMAFRA funding was cut by 43% from 1991/92 to 1997/98.<sup>66</sup>
- Similar cuts to Ministry of the Environment (MoE) funding seriously compromise the Ministry's ability to protect against agricultural practices that are environmentally harmful.
- Agricultural land preservation programs have been cut.
- The Land Stewardship Program has been cut.
- Inspection of fruits and vegetables for pesticide residues has been eliminated by OMAFRA and greatly reduced by MoE. This is in spite of the fact that producers want a strong inspection program because it increases public confidence in their produce.<sup>67</sup> This diminished monitoring capacity is of particular concern in view of the push to increase applications of treated sewage sludge to agricultural land, and the proposed waving of case-by-case testing and approval for such applications.

### **Deregulation and privatization:**

- OMAFRA's mandate is clear from its business plan: "The ministry's efforts to provide the agri-food industry with more direct involvement in the delivery of some government services and programs will continue."
- A number of commodity quality inspection programs have been cut, and grants have been given for producer groups to establish industry self-regulation. Grow Ontario funding has been provided to an Ontario meat and poultry industry group to "position the industry to take over many of the government's traditional inspection functions."<sup>68</sup>
- Introduction of Bill 146, the "right to farm" legislation, serves to broadly immunize farmers from "nuisance" lawsuits. The Bill would complicate, and increase the costs of, the public's ability to bring legal action against such enterprises as intensive hog operations.<sup>69</sup> Bill 146 also provides a mechanism through which the Normal Farm Practices Board can overturn municipal by-laws that attempt to control the establishment or impacts of "normal" farm operations on appeal by farmers.<sup>70</sup>

### **Initiatives favouring development over agricultural land preservation:**



- Grow Ontario provided funding for a study “to develop and document the process of acquiring crown land for direct economic activity.”<sup>71</sup>
- Changes to the *Planning Act* give municipal councils more freedom to develop agricultural land. Amalgamation, downloading and other demands are pressuring councils to increase their tax base, which is leading to the granting of more severances. In addition, over the last year, the Minister of Municipal Affairs has overridden local planning decisions on a number of occasions in favour of particular economic interests.<sup>72</sup>
- Legislative and policy changes make it much easier for municipalities to amend official plans.
- Changes to the property tax rebate system for farmers encourage municipalities to raise the tax rate on agricultural land, making farming more expensive and encouraging sale of land to developers.

#### Focus on export:

- Strong focus in Grow Ontario funded research on export crops.<sup>73</sup>
- The 1996 to 1997 Agricultural Research Institute of Ontario report states that, thanks to multilateral and regional trade agreements, there are opportunities for Canadian food firms to expand sales beyond Canada. They advise that “niche strategies focusing on value may best be pursued through strategic alliances or joint ventures between Canadian firms and multinational organizations.”<sup>74</sup>
- OMAFRA’s 1997 to 1998 Business Plan aims to increase Ontario’s food and agricultural exports to \$10 billion by the year 2001 (from \$5.3 billion in 1996). A key performance measure for Ontario is to outproduce main competitors in North America (e.g., increase Ontario's soybean output relative to Ohio and Michigan).<sup>75</sup>

#### Supporting traditional models of competitiveness:<sup>76</sup>

- OMAFRA’s vision statement is: “To foster competitive, economically diverse and prosperous agriculture and food sectors and promote the economic development of rural communities.” There is no mention of integrating economic development issues with the environment.
- Funding under the new Rural Jobs Strategy (\$26 over 3 years, terminating March 31, 2000) is designed to stimulate competitiveness, economic growth and job creation in rural Ontario. According to Manager Brian Cardy, there are no environmental criteria for approved projects.<sup>77</sup>

#### Promoting Biotechnology:

- OMAFRA’s 1997-98 Business Plan expresses the following commitment: “Ministry participation in a consortium of universities, commodity organizations and agri-businesses will promote the use of biotechnology and improve competitiveness throughout the agri-food sector.”
- A host of University of Guelph and Grow Ontario funds are earmarked for biotechnology-related research.<sup>78</sup>

- In January 1997, Ontario Agri-Food Technologies (OAFI) was incorporated as a private, not-for-profit consortium of Ontario grower associations, industry, universities and government. The Agricultural Research Institute of Ontario (ARIO) financially supported the group to assist it in its mandate: the commercialization of technologies that will generate new wealth for Ontario, with a heavy focus on biotechnology. Dr. Murray McLaughlin, formerly Chair of Ag-West Biotech, and Deputy Minister of Agriculture, Saskatoon has led OAFI since July 1997.<sup>79</sup>

#### Limiting Public Input:

- The Environmental Commissioner of Ontario (ECO), Eva Ligeti, charged that many legislative changes, including those related to the agriculture and food sector, “have been regularly made with little or no comment in the Environmental Registry, and little or no other public consultation.”<sup>80</sup>
- There is a provincial proposal to remove EBR registry public notice requirements for approval of pesticides with new active ingredients on the basis of a yet-to-be-established national system.
- The new *Planning Act*, Bill 20, introduces many restrictions on public involvement in land planning conflicts.
- Bill 146 allows individual farmers to challenge municipal or zoning bylaws on an ad hoc basis, undermining the public process that created such bylaws and represents the interests of a community as a whole. Bill 146 also grants the Minister of Agriculture, Food and Rural Affairs the power to issue statements on subjects that are not before the Normal Farm Practices Protection Board. The fear is that the minister could be pressured to use these powers to wedge investor-driven mega-farms into the countryside.<sup>81</sup> In addition, part (h) of the definition of “agricultural operation” should be removed to ensure that chemical spraying will not enter the protected categories of odour, noise or dust. Farmers should not be compensated if they are not allowed to use a normal farming practice.<sup>82</sup>

A few initiatives have been undertaken, with some features that appear positive, but they are being implemented in a way that compromises the fundamental transition to environmentally sound agriculture:

- The Environmental Farm Plan, Nutrient Management Plan, and Best Management Practices publications: These projects may well reduce pesticide and other potentially harmful inputs, and ameliorate environmental impact, but are only first steps in a transition to a sustainable agriculture system. For example, the Best Management Practices booklet on Integrated Pest Management, while including information on such non-chemical means as trap cropping, crop rotation, biological control and sanitation measures, presents IPM largely as an intelligent way of predicting and responding to insect and disease infestation, rather than a preventive systems approach.<sup>83</sup>
- OMAFRA has been involved for a number of years in the development of national standards for organic agriculture. It appears that this process is in its final stages, and that standards will be announced soon. OMAFRA anticipates complying with implementation requirements.<sup>84</sup>

- OMAFRA sits on the board of the federally-funded National Soil and Water Conservation programme.
- OMAFRA's pesticide container recycling program resulted in 512,000 pesticide containers being collected in 1997.<sup>85</sup>
- OMAFRA's pesticide applicator education and safety program has certified 34,000 growers.<sup>86</sup>
- OMAFRA's research activities include: the biological control of pest and disease problems of various crops, comparisons of conventional and organic production systems, and the use of cover crops.<sup>87</sup>
- No-till systems have been promoted for a number of years to reduce erosion, but this is only partially positive because most no-till systems require higher levels of pesticide use.
- Significant reductions in phosphorus loadings of waterways has been achieved.
- Some OMAFRA staff have been supporting efforts to restrict livestock access to wetlands and watercourses to improve water quality and protect habitat; however, OMAFRA also cut the Clean Up Rural Beaches (CURB) program, which funded farmers to do exactly that.
- OMAFRA staff promote Community Supported Agriculture projects on a small scale.
- It appears that the provincial lands designated as the Duffin-Rouge agricultural preserve will not be lost, but will be privately sold in consolidated farm lots with agricultural easements attached to the deeds. The provincial government has indicated that it is in agreement with the official plan of both the region and Pickering town council, and wants this land preserved in posterity for agricultural use.<sup>88</sup>

Unfortunately, these efforts are woefully inadequate, given the environmental problems of Ontario agriculture. In fact, the vast majority of initiatives related to environmental problems are actually making the situation worse.

More specific examples of anti-environmental initiatives are provided below.

### **Loss of Protection for Agricultural Land**

#### **Loss of Conservation Easements**

On July 13, 1995, the Conservative government cut \$15 million in funding for the purchase of conservation easements designed to protect the Niagara Fruit Belt from urban development. As the trend is to remove land used for nutritious fruit growing to serve as the basis for luxury wine consumption, the demise of the Tender Fruit Lands Program has encouraged Niagara to become a grape monoculture. Also, this former fruit land tends to suffer from poor air circulation, being closer to Lake Ontario, and so will be more difficult to cultivate using organic methods. Another result of the loss of conservation easements is that the provisions for specialty crop land protection have been weakened in the new agricultural policy statement under Bill 20. This has already resulted in one urban expansion in the town of Lincoln, and possibly another in Pelham, perhaps to be resolved by an expensive OMB hearing. This is the sort of thing that clear policies of prohibition in Bill 163 were designed to discourage.<sup>89</sup>

#### **Loss of Planning Tools to prevent urban sprawl**

Changes to the *Planning Act* and related policy statements have the effect of encouraging urban sprawl. Requirements that stipulated the provision of adequate infrastructure prior to the approval of new developments (the “prematurity” test) have been weakened. A key change is that the requirement that planning decisions “be consistent with” provincial planning policy has been replaced with a requirement that they “have regard to” provincial policy statements. The Act allows municipalities to prohibit two-unit housing developments in favour of single-family homes. It also allows municipalities to exempt prime agricultural land from protection if they can demonstrate a non-agricultural need for the land within a 20 year time-frame, and a lack of alternative non-agricultural land. Extraction of minerals and petroleum resources on prime agricultural land is also allowed, provided that the site is rehabilitated.

### **On-going Promotion of Pesticides**

Although pesticide approvals and regulations are primarily a federal responsibility, the provincial government is doing what it can within its jurisdiction to make it easier to bring pesticides to market, and thereby reducing the scope of environmental product review. They have also reduced supports to programs promoting Integrated Pest Management (IPM).

### **Regulatory Easing of Requirements for Permits**

Proposed amendments to the provincial *Pesticides Act* would remove permit requirements for applications that “pose little environmental risk” and replace them with audited regulations. While it may be a positive step to de-regulate use of some of the lower-risk pesticides on the proposed list, a number of higher-risk chemicals are included as well. A change from requiring permits to audited regulations could allow unrestricted use of aquatic herbicides in cottage locations.<sup>90</sup> And, with the cuts in MoE staff, it is hard to imagine that audited regulations would ensure public and environmental safety.

Another proposed amendment would simplify or eliminate requirements for public notice (i.e., signs) where IPM practices are in place. This amendment is being advocated by some golf courses, who complain that the present posting requirements deprive them of the use of a green for a full day.<sup>91</sup> While MoE is still looking at a number of options in this regard, it is important to remember that the term IPM embraces a wide variety of scenarios, running the gamut from environmentally benign to much more risky. Losing or simplifying the requirements for public notice would deprive golfers and surrounding communities, including sensitive sub-populations such as pregnant or nursing mothers and immuno-compromised individuals, of information that could be crucial in making health decisions.

### **Streamlining of the Process of Getting Pesticides to the Market**

Proposed amendments to the *Pesticide Act* will allow the Minister of and the Environment to delegate the co-ordinator of the Pesticide Advisory Committee, whose members are appointed by the Ministry, to classify a pesticide, eliminating one step and much time from the process of bringing pesticides to market.

### **Food Systems 2002**

Food Systems 2002 has the goal of reducing pesticide use by 50% by the year 2002, based on 1983 pesticide usage figures. Pesticide usage in 1993 was 28% lower than in 1983. However, roughly 85 to 90% of this reduction is due to three factors: the use of new herbicide products that are effective at the gram per hectare rather than kilogram per hectare level, reduced application rates of old herbicides on field corn, and a reduction in nematocide use in tobacco. While pesticide use in field crops decreased by 33%, usage on fruits and vegetables rose by 10% and 12% respectively.<sup>92</sup> Ontario's approach is consistent with many other governments, categorized by some reductions in use, but no decrease in pesticide reliance because the strategies fail to address how the design of agricultural systems must be changed in order to reduce use, risk and reliance all at the same time.

Projects funded by the program vary widely in their potential impact. On the positive side, some research is ongoing for biological control of pest and disease problems of various crops, comparisons of conventional and organic production systems, and the use of cover crops. Food Systems 2002 is also funding mandatory certification programs for users of agricultural pesticides, and a pesticide container recycling program. Another current programme involves research into more effective use of conventional pesticides, for example with better spray technology or reduced rates. Although this may seem to be somewhat helpful, it continues to perpetuate ongoing pesticides use rather than eliminating pesticides or encouraging the use of alternatives. On the negative side, Food Systems 2002 funds are being used to support efficacy testing of new chemicals toward national registration.

Ontario has Integrated Pest Management (IPM) programmes for a variety of crops, including apples, potatoes, and crucifers (cabbage, cauliflower, broccoli, etc.). OMAFRA produces IPM publications, extension workers deliver IPM programs, and scouts monitor pest populations. However, IPM programs in Ontario are characterized by a primary reliance on efficient chemical control of pests and diseases. While such methods as crop cultural rotations, pest control by natural enemies, and the use of resistance varieties are mentioned, central focus is given to pest and disease monitoring and scouting, followed by efficient chemical cures. There is very little focus on pest and disease prevention. While such IPM programs probably do reduce overall use of pesticides, they do not reduce reliance on chemicals. In addition, the number of IPM specialists has been reduced, as has staff support to pesticide residue monitoring.

### **Research**

Other than the Food Systems 2002 mentioned above, OMAFRA funds other research, most notably at the University of Guelph, through the Grow Ontario program. While some research is environmentally positive, much of it is focused on biotechnological solutions, funded by transnational agrochemical corporations, and characterized by a focus on increasing exports and market competitiveness. With the possible exception of research funded through Food Systems 2002, issues of sustainability and of mitigation, lessening or remediation of the negative environmental impact of conventional agricultural practices are largely missing from OMAFRA's research portfolio.

### **Land and Water Contamination from Biosolids, Pesticides, Fertilizers and Other Contaminants**

OMAFRA is promoting use of sewage sludge and other biosolids. The Ministry works closely with the Environmental Farm Coalition, a sub-committee of which is entitled the Biosolids Utilization Committee. This mainstream farming group is pushing for greater use of treated sewage waste (biosolids) on agricultural lands as a cheap supplier of fertilizer.

While it is the responsibility of the Ministry of the Environment to regulate such applications, it appears that MoE has put the economic considerations of disposing of sewage sludge and other waste ahead of sound environmental and agricultural principles that use the precautionary principle to guide policy. While MoE guidelines regulate the maximum content of a number of heavy metals for agricultural applications, there are no regulations for toxic organic chemicals, e.g., PCBs, chlorinated dioxins, furans, nonyl phenol, phthalates, or organic pesticides. These chemicals have a variety of toxic effects, including carcinogenicity and endocrine disruption. Some, for example the estrogenic chemical nonyl phenol, have been documented as occurring in significant concentrations in Ontario sewage sludge. While successive provincial governments made some attempts to regulate the use of such sludge, with the present government, this effort has collapsed. There are two other notable concerns. Current MoE guidelines allow mixing of highly-toxic wastes from industrial processes with relatively benign sludge, providing that the resulting mix meets the guidelines for heavy metals. And, at present, a person wanting to apply treated sewage sludge (renamed "biosolids" or "soil enrichment") to agricultural land is required to apply for a certificate of approval, with MoE having a number of monitoring steps in place to guard against negative environmental impact. However, the Conservative government is proposing to exempt agricultural biosolids applications from the requirement for a certificate of approval, weakening the Biosolids Guidelines by making applications subject only to a Standardized Approval Regulation (SAR). Anyone wishing to put sewage sludge onto agricultural land will no longer have to get a certificate of approval. Currently, to get a certificate of approval, an applicant has to analyze the sludge to determine its level of contaminant, and an agronomist comments on the potential impacts. In addition, the applicant may be required to provide field monitoring. The SAR would by-pass all of these safeguards. Operators will be expected to follow the procedures without any involvement from the MoE. Given the enormous cutbacks in the MoE since 1995, it is questionable whether there would be any significant auditing of sewage sludge applied to land.<sup>93</sup>

#### **Large-scale Operations Included as "normal farm practices":**

Bill 146, the *Farming and Food Production Protection Act*, was passed into law on May 13, 1998. It provides farmers with protection from so-called "nuisance" complaints from neighbours, related to odour, dust, noise, etc. There is concern that this Act may enshrine the polluting practices of large-scale livestock operations as "normal" farm operations, thereby insulating them from municipal control. It may also be used to rationalize large-scale agricultural applications of industrial and urban sewage sludge.

A definition of a "normal farm practice" already exists in section 15 of Ontario's *Environmental Protection Act*. Under this section, offsite pollution is not permitted except in cases of normal farming practice. Under Bill 146, prosecutors face the difficult task of proving that contamination has resulted from an abnormal farm practice. This bill also reduces the ability of

those suffering beside large animal confinement facilities to sue for an expanded list of nuisances.

OMAFRA has worked with the Environmental Farm Coalition to develop farmer-designed plans for manure management. While the planning framework is a rational one, and may help institute better management practices, OMAFRA/EFM communications on the subject admit that the program is “intended to strengthen society's acceptance level of large-scale livestock operations.”<sup>94</sup>

### **Soil Erosion and Nutrient Loss**

OMAFRA promotes no-till as a solution to soil erosion and nutrient loss problems. However, as mentioned above, while no-till certainly has positive effects in these areas, it also tends towards increased pesticide use. It should be noted that much of the no-till research is funded by agrochemical companies. Use of no-till also facilitates increased farm size. In the opinion of at least one soil scientist, “No-till/direct drilling is a planting technique that has been adopted by many farmers because it reduces the amount of labor, time, diesel fuel... invested in cropping a piece of land... No-till planting facilitates the current trend towards cash grain farmers renting more and more land that is farther and farther away from their home farms... No-till planting allows farmers to visit their fields once or twice to plant/spray and under ideal circumstances come back only once more to harvest... the cash grain farmers that I am working with? that farm thousands of acres could not possibly work so many acres without no-till planting...”<sup>95</sup>

### **Energy Inefficiency**

Given the inefficiencies of the system, governments should be promoting measures that reduce distance in the food system. Instead, the Ontario government has extensive export promotion initiatives underway:

#### **Export Promotion**

Grow Ontario, a one-year, \$10.5 million dollar project, funded a huge variety of programmes designed to help Ontario growers market their produce. A large percentage of the approved projects were designed to increase Ontario's agriculture and food exports. The 1997-8 official OMAFRA business plan also includes a strong focus on exports. OMAFRA's mission statement includes the following: “to promote value-added agriculture, increased exports and an improved agriculture and food trade balance.”

#### **Fuel Subsidies.**

The Ontario Ministry of Finance, Motor Fuels and Tobacco Tax Branch, offers a tax rebate on clear fuel used in “Power Take-Off” equipment, driven by the same engine that propels a licensed vehicle. Also, consumers who use unlicensed, diesel-powered equipment must fuel their equipment with coloured (dyed) fuel. No Ontario fuel tax is payable on coloured fuel. In 1996, fuel rebates were worth \$6.85 million to farmers.<sup>96</sup>

### **Greenhouse Gas Reductions**

Ontario does not appear to have a plan of action on climate change. Canada's National Action Plan on Climate Change includes measures currently being taken by agricultural producers that either reduce greenhouse gas emissions or increase carbon fixation in soils. These measures include use of conservation tillage practices, reductions in summerfallow, increased lands in forage production and higher crop yields. Current estimates suggest that the sector will be able to reduce Canada's greenhouse gas emissions by an estimated 14 million tonnes of carbon dioxide equivalent by the year 2000. Ontario's commitment to climate change, based on statements around the Kyoto Conference, is weak.

### **Promotion of Biotechnology**

Biotechnology is a major focus of OMAFRA-funded research, especially research conducted at the University of Guelph. Under the Grow Ontario program, OMAFRA gave \$80,000 to the Food and Consumer Products Manufacturers of Canada to: "initiate market research to determine the messages to communicate effectively with Canadian consumers about genetically engineered (novel) food products. The results can be used to overcome consumer resistance as has occurred in the USA and Europe."<sup>97</sup> Promotion of biotech is seen as a primary focus for the Agricultural Research Institute of Ontario, the body that oversees OMAFRA agricultural research, and whose members are appointed by OMAFRA.<sup>98</sup>

## **RECOMMENDATIONS FOR POLICIES AND ACTIONS**

We see three main areas for ENGO activity: proposing and lobbying for changes to provincial food and agricultural policy; participating in the development of new eco-entrepreneurial activities; and developing joint actions with public health agencies and advocates.

### **Proposing and Lobbying for Changes to Provincial Food and Agricultural Policy**

Our policy making apparatus is a product of long-standing beliefs and assumptions. Its structure has been assembled over many years, generally following a pattern of incremental additions, with the overall coherence of the structure rarely assessed.<sup>99</sup> Consequently, an evolutionary transition to a new policy system is an unfortunate reality. We employ a transition framework that has been used previously to map out desired changes in the food and agriculture system.<sup>100</sup> This framework serves as both a guide to action, and an indicator of progress. It is not used, however, to suggest the sequence by which advocates should work on policy change, but rather how these changes might fit into an overall plan of attack.

In this framework, Stage 1 strategies (to 2000) involve making minor changes to existing practices to help create an environment somewhat more conducive to the desired change. The changes would generally fit within current policy-making activities, and would be the fastest to implement. In these stages, policies and programmes previously in place might be reinstated. Second stage strategies (to 2005) focus on the replacement of one practice, characteristic or process by another, or the development of a parallel practice or process in opposition to one identified as inadequate. These take longer to implement and are likely to produce more institutional resistance. In this stage, new incentive structures and programmes for sustainability



are put in place, e.g., subsidies, credit, training, research, and extension. There are also penalties for unsustainable behaviour. Finally, third stage strategies are based fully on the principles and values outlined in section 2. They take longer to implement and demand fundamental changes in the use of human and physical resources. This final, or redesign stage (beyond 2005), is unlikely to be achieved until the first two stages have been attempted. Ideally, strategies should be selected from the first 2 stages for their ability to inform analysts about redesign (the most underdeveloped stage at this point) and to contribute toward a smooth evolution to the redesign stage. The redesign stage needs to be worked on from the beginning, but we should see our investments as long-term.

### **1. By the Year 2000 the Provincial Government should:**

#### *Pollution abatement:*

- A. End the spreading of paper mill industrial waste.
- B. Work proactively with municipalities and other ministries on guidelines for industrial composting, quality control and land application.
- C. Put an immediate moratorium on any further spreading of sewage sludge and other wastes on agricultural land, since current laws and by-laws are not comprehensive enough to sufficiently prevent and control source discharges so that a high quality sewage sludge is generated. The Ontario Government should develop a sewer-use regulation that controls and prevents source discharges of contaminants, including toxic organic ones. The Ontario Government should not apply the SAR to the application of sewage sludge to agricultural land. In addition, municipalities should only consider beneficial use of sewage sludge after strengthening by-laws with the addition of an effective pollution prevention programme and prohibitions and limitations on toxic organic chemical discharges to sanitary sewers.<sup>101</sup>
- D. Implement a comprehensive programme of restricting livestock access to waterways, including small grants to farmers to implement rotation grazing, alternate water sources, and fencing.
- E. Create and enforce an environmental code of practice for the aquaculture industry. For example, the Holmenkollen Guidelines for Sustainable Industrial Fish Farming place aquaculture within a larger framework of integrated coastal zone management and call for taking a precautionary approach. The guidelines also endorse reducing waste and pollution, shifting from the use of fish meal to other sources for feed, conserving genetic diversity, and increasing integrated polyculture, especially for the purposes of cleaning up organic pollution.
- F. Subject animal wastes to existing waste disposal legislation.
- G. Ensure that there is agricultural and environmental group membership on municipal planning committees.
- H. Increase MOE funding for inspection of Ontario produce for pesticide contamination
- I. Require that pesticides only be available by prescription.
- J. Work with municipalities to eliminate the use of lawn chemical pesticides and fertilizers by the year 2000, in conjunction with actions to restrict chemical use in urban areas (parks, rights-of-way, boulevards), and an educational campaign alerting the public to the dangers of pesticide exposure. Subsidize retraining programs for commercial applicators.
- K. Promote biogas generation as part of farm manure management practices.

L. Remove the exemption of waste agricultural pesticides from the definition of hazardous wastes.

M. Remove the provincial sales tax exemption for agricultural pesticides.

*Environmental product market development:*

N. Support implementation of the National Organic Standards currently being developed by the organic food industry and the Canadian General Standards Board.

O. Work with marketing boards to eliminate barriers to development of market channels for environmental products.

P. Adopt enabling legislation, such as that in B.C. and Quebec, related to food quality and local production and processing logos.

Q. Aggressively create new partnerships with farmers and processors to promote products of IPM systems.

*Research and training:*

R. Set up training programs for food processing industry plant operators and supervisors on environmental sustainability and plant management.

S. Establish farmer transition courses at all agricultural colleges. Include education about alternative markets such as community supported agriculture (CSAs) and farmers' markets.

T. Devote increasingly larger percentages of the OMAFRA research budget to research on the transition to sustainable practices.

*Agricultural land protection:*

U. Refinance the Conservation Easement Program in the Niagara Tender Fruit Lands.

V. Recreate agricultural preserve legislation.

W. Re-define Bill 146 to focus on local/environment/economic reasonableness and necessity of farming practices, rather than "normalcy". Re-focus the bill on preservation of agricultural land, not preservation of agricultural practices. Balance the rights of farmers to conduct environmentally sound farming with the rights of municipalities to regulate agricultural activity.

X. Reinstate the Farm Tax Rebate programme so that rebates come from the Province, ensuring that municipalities don't have a financial incentive to rezone agricultural land.

*Subsidy removal:*

Y. Terminate funding for food biotechnology promotion. Industry should pay the full costs.

Z. Gradually phase out fuel subsidies as supports for the transition to sustainable agriculture are put in place.

**2. By the Year 2005 the Provincial Government should:**

*To support the transition to sustainable agriculture*

A. Develop enabling legislation to provide financial assistance to fund environmental protection structures, equipment and practices.

B. Develop subsidy programmes to support the transition to sustainable practices, as practiced now in most European nations. Their implementation should coincide with the removal of subsidies that discourage environmental stewardship.

C. Set up a policy framework for combinations of the following measures to protect agricultural land: land trusts, conservation easements or agreements, transfer of development credits or cross-compliance in programme criteria. The Green Door Alliance's recommendations for land use and preservation of the federal and provincial lands to the northeast of Toronto provide a model for flexible implementation of a variety of measures. When considering agricultural land for preservation, specialty crop land should have the highest priority for preservation, followed by Class I to Class IV, in descending order.<sup>102</sup>

D. Enact restrictive zoning legislation requiring environmental Best Management Practices (BMP) in sensitive areas. An important aspect of restrictive zoning is having the land base to effectively use manure as a fertilizer.

E. Charge processors for groundwater use.

F. Work with the federal government to restrict imports of food that have residues of chemicals not licensed for use in Canada.

G. Charge manufacturers for any packaging that cannot be used or recycled.

*Research and training:*

H. Research the relationship between soil management and nutritional quality.

I. Implement an experiential learning model in one agricultural college that focuses on environmental responsibility (modeled on Hawkesbury College in Australia).

J. Transform marketing staff into brokers that bring together producers and consumers of local agricultural products.

*Create model farms:*

K. Support seed banks and genetic conservation farms to preserve domestic plant/animal genetic diversity.

L. Set up model sustainability demonstration farms around the province.

M. Establish model urban farms, demonstrating a full range of urban food production techniques; provide support to urban community gardening.

### **3. Beyond the Year 2005**

A. Create a comprehensive import substitution program to focus agricultural policy and programming around building regional self-reliance.

B. Where commodity prices are regulated, explore the incorporation of environmental costs into food prices to ensure the economic viability of environmentally sound agriculture.

C. Establish comprehensive food planning systems in which optimal nourishment requirements for the population are used to design the food supply system. This is increasingly done in the energy field and needs to be adapted to the food system.

D. Create a department of food and food security that incorporates functions now held in OMAFRA and the Ministry of Health.<sup>103</sup>

E. For foodland preservation, consider a policy of imposing proportional taxes on the transfer of land for certain uses. For example, if a developer wishes to purchase and develop agricultural land or wetlands, they would pay a proportional levy to compensate for society's losses. The levy would cover the increased energy inefficiency associated with loss of local food self-

reliance, the loss of carbon sinks, water purification, wildlife habitat, biological pest controls, and would also include the polluting and infrastructural externalities associated with development.<sup>104</sup>

F. Advocate for a development policy that stipulates that all approvals must be in place before work proceeds on sites. This should be enforced with stiff penalties if transgressed, e.g., require that developers rehabilitate site to its original condition before approvals are granted.<sup>105</sup>

### **Economic Implications**

Many of these recommendations provide directions to provincial staff on what activities should be considered priorities, and therefore do not have additional financial implications. Others provide guidance to the private sector, and if there are to be additional costs, those would likely be recouped in the market place. Some recommendations are designed to shift subsidies from less sustainable activities to more sustainable ones, and could be designed ultimately to be neutral in their impacts on the provincial budget. The most significant additional expenditures would be for enforcement staff.

### **Participating in the Development of New Eco-entrepreneurial Activities**

The environmental movement can play a role in brokering new kinds of projects with both positive economic and environmental implications. No one is performing this function currently, and with the state's withdrawal from traditional roles, this is a void that needs filling. We provide three examples of how this process can work.

#### **Community Supported Agriculture (CSAs)**

Many farmers and consumers are interested in a new approach to distribution that reduces distance in the food system - Community Supported Agriculture. In this model, consumers subscribe to a season of produce for a set fee. Farmers then know when they plant that their product will be sold. Consumers know more about the practices that produce their food and are assured of very fresh product. This approach has been expanding rapidly in Japan, Europe and the USA; there are now several dozen CSAs in Ontario.

Finding farmers who are interested in this approach, and then identifying groups of consumers to subscribe is a key function of expanding CSAs. OMAFRA has played something of a brokering role in this function through an extension agent in Peterborough, but much more needs to be done. New businesses are emerging such as Toronto Organics, which buys from Greater Toronto Area CSAs and delivers to participating consumers. They accept part of their payment in green dollars, and are, therefore, linked to the Toronto Local Exchange Trading System (LETS). This helps people of limited incomes participate. NGOs have also helped with this, including the Green Communities projects. There is a prime opportunity for the environmental community to play this kind of role.

#### **Localizing Agriculture**

Farmers in Huron County are working with hospital buyers in their county and in Toronto. A consortium of Toronto hospitals who wanted to buy more local products initiated the project. The economic development unit in Huron County expressed interest in directly linking the growers in their region with the hospitals. Initial discussions were facilitated by the Toronto Food Policy

Council, which had linkages in both communities. The Huron County economic development group developed a funding proposal to study the current food flows and feasibility of the project. Hospitals have been specifying their purchasing criteria and farmers are considering how these can be met.

What is again critical to this kind of project is an agency that brokers the arrangement. OMAFRA's Foodland Ontario programme has done this in a limited way. Although some Foodland Ontario staff have indicated an interest in playing a more active role, they appear to be constrained by resources and the current political environment, which encourages support for these kinds of activities through government grants rather than through direct service.

### **IPM Products**

After years of lobbying farmers and government to change the pesticide laws in this country, World Wildlife Fund (WWF)-Canada, has decided that the best way to get what they want is to put people together to make money by producing a lower-pesticide product that consumers will buy for its environmental and health benefits.

With eight apple growers the first year from Ontario's Beaver Valley near Collingwood, a local juice presser, and Sweetie, Canada's largest apple juice processor, WWF has assembled an unusual team that is united by the common desire to respond to consumers' concerns about pesticides.

The Beaver Valley is a beautiful part of the Niagara Escarpment, one of the World Biosphere Reserve sites. It's also a major apple growing region in Ontario, which, according to at least one local veterinarian who calls it Death Valley, explains the elevated rates of cancer among local orchardists.

Apples are one of the more difficult crops to grow without chemicals, mostly because farmers and scientists don't fully understand what makes apple trees healthy and resistant to pest attack. IPM is a transitional step towards more organic practices. The idea is to get as many growers as possible reducing pesticide use. As even organic farmers have admitted, there's a bigger bang for the buck having 50% of the growers making 50% reductions than having only 1% go completely organic. In reality, both can happen at the same time.

The basic approach undertaken by WWF is to develop with the orchardists an IPM guide. The growers follow the guide, keep good records, and WWF hires an independent inspector to verify that the growers have met the standard. The growing practices must be sufficiently rigorous to differentiate the IPM practices from the norm, yet not be so rigid as to remove a grower's management options.

To reduce their use of pesticides, growers have their fields monitored regularly for pests, attract beneficial insects, birds and bats to prey on pests, spray only those parts of the orchard that really require it, and select less environmentally harmful products.

Critical to the success of such initiatives are the food processors who, in our current food system, link most farmers and consumers. The processor does most of the work of getting the product into the mainstream retail outlets readily accessible to consumers. The processor also pays a 10% price premium to the growers, which helps compensate them for any additional costs associated with changing their growing practices during the first few years. WWF lends its name to the marketing effort to enhance the product's environmental credibility in the market place.

### **Developing Joint Actions with Public Health Agencies and Advocates**

Public health advocates and agencies are increasingly concerned about the organization of the food and agriculture system, believing that many major public health challenges are emerging from this sector. For example, a recent report by the Toronto Public Health Department recognized that poor nutrition, antibiotic-resistant bacteria, chemical contaminants, emerging food safety problems, and food biotechnology are all health problems related to the way we grow, process and distribute food.

The Ontario Public Health Association released a report in 1996 on a food and nutrition strategy for Ontario that in addition to addressing traditional public health domains like nutrition, also tackled hunger and the need for sustainable agriculture.

Public health authorities are also major potential allies for battling intensification in the animal agriculture sector. In Huron County the public health authority is involved in examining the health consequences of elevated fecal material in local waterways, and the increasing evidence of antibiotic-resistant bacteria.

Environmentalists must develop much stronger links with the public health infrastructure, which is much better resourced than most environmental groups; recognizes how the environment impacts on health and is looking for information and ideas on how to address these complex health challenges; and has great acceptance in the general public and is hard for the provincial government to attack.

Environmentalists should learn more about both their local health department and the municipal Board of Health that sets public health policy. Most boards provide opportunities for public input into decision-making. In many municipalities, environmentalists have used these boards to further other environmental agendas. But now, with new information available on the linkages between food, environment and health, there are fresh opportunities to use the boards for furthering change in the food system.

### **CONCLUSIONS**

The Ontario food and agriculture system is a major contributor to environmental degradation, with the Ontario Ministry of Agriculture, Food and Rural Affairs actively contributing to the problem. Since taking office, most of the initiatives of the present government have increased environmental problems, and what few positive steps have been taken will not have significant positive impacts.

Solutions exist to most of these problems, many revolving around the adoption of sustainable and more local food and agricultural systems. Other jurisdictions have done very positive things to bring about this transition. The environmental community will have to do substantial advocacy work to have a green agriculture and food agenda adopted by the provincial government.

## ENDNOTES

- <sup>1</sup>. For a summary of the arguments on this theme, see D. Knorr and H. Vogtmann, "Quantity and quality determination of ecologically grown foods", In: D. Knorr (ed.), *Sustainable Food Systems* (Westport, CT: AVI Publishing, 1983), pp. 352-381.
- <sup>2</sup>. Changes in net income between 1996 and 1998 (forecast) are not included because of different methods of calculation.
- <sup>3</sup>. Statistics Canada, *1996 Census of Agriculture*, Publication No. 93-356, Statistics Canada, *Historical Overview of Canadian Agriculture*, Publication No. 93-358, Statistics Canada, *Agricultural Profile of Ontario*, Publication No. 95-177.
- <sup>4</sup>. Total rural farm population figures from the 1996 Census are not yet available, so this estimate multiplies the total number of farms in 1996 by the average farm family size in the 1991 Census.
- <sup>5</sup>. Statistics Canada, *Historical Overview of Canadian Agriculture*, Publication No. 93-358,
- <sup>6</sup>. T. Hazledine, "Market power or relative efficiency?: An examination of profitability performance in the Canadian food and beverage sector", *Agribusiness* 5, 1989, pp. 25-42.
- <sup>7</sup>. Some argue that global economic factors are the major contributors to low farm incomes and loss of farms, but the negative impacts of the global agricultural economy cannot be divorced from the rise of multinational firms and global corporate concentration (cf. R. Barnett and R. Müller, *Global reach* (New York: Simon and Schuster, 1974); R. Burbach and P. Flynn, *Agribusiness in the Americas* (New York: North American Congress on Latin America, 1980); F. Clairmonte and J. Cavanagh, *Merchants of drink: Transnational control of world beverages* (Penang, Malaysia: Third World Network, 1988).
- <sup>8</sup>. Statistics Canada, *Historical Overview of Canadian Agriculture*, Publication No. 93-358.
- <sup>9</sup>. Statistics Canada, *1996 Census of Agriculture*; Publication No. 93-356; Statistics Canada, *1991 Census of Agriculture*, Publication Nos. 93-350 & 93-351.
- <sup>10</sup>. Statistics Canada, *Historical Overview of Canadian Agriculture*, Publication No. 93-358.
- <sup>11</sup>. Ontario Ministry of Agriculture, Food and Rural Affairs, *An Agricultural Land Protection Program for Ontario*. Discussion paper, April 1992.
- <sup>12</sup>. Friends of Foodland, *Hunger in a Time of Abundance*. Draft paper, August 1986.
- <sup>13</sup>. Preservation of Agricultural Land Society (PALS), *Commentary on the Agricultural land Protection Program for Ontario*. A Discussion Paper



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<sup>14</sup>. John Bacher, Preservation of Agricultural Land Society. Communication to MacRae and Cuddeford; Environment Canada, *A State of the Environment Fact Sheet: Urbanization of Rural Land in Canada, 1981-86*, SOE Fact Sheet No. 89-1

<sup>15</sup>. B. Gilmour, Ted Huffman, Andy Terauds and Charles Jefferson, "Incentive Problems in Canada's Land markets: Emphasis on Ontario". *Journal of Agricultural and Environmental Ethics*, 9:1 (1996), p. 16-41.

<sup>16</sup>. Colin Chung, Planning Department, City of Brampton. Conversation with Vijay Cuddeford, May 28, 1998

<sup>17</sup>. Pest Management Regulatory System, *Regulatory Information on Pesticide Products (RIPP) database*. Chem Source CD, The Canadian Centre for Occupational Health and Safety (CCOHS), May 1998.

<sup>18</sup>. Statistics Canada, *Agricultural Profile of Ontario*, Publication No. 95-177.

<sup>19</sup>. Statistics Canada, *Historical Overview of Canadian Agriculture*, Publication No. 93-358.

<sup>20</sup>. Craig Hunter and Bill McGee, Ontario Ministry of Agriculture, Food and Rural Affairs, *Survey of Pesticide Use in Ontario, 1993*. Toronto: OMAFRA, 1994.

<sup>21</sup>. Statistics Canada, *1996 Census of Agriculture*, Publication No. 93-356.

<sup>22</sup>. Kaye H. Kilburn and John C. Thornton, "Protracted Neurotoxicity from Chlordane Sprayed to Kill Termites", *Environmental Health Perspectives*, 103:7-8 (1995), p. 690-694.

<sup>23</sup>. Linda Rosenstock, Matthew Keifer, William E. Daniell, Robert Mc Connell, Keith Claypoole, and the Pesticide Health Effects Study Group, "Chronic central nervous system effects of acute organophosphate pesticide intoxication", *Lancet* 338 (1991), p. 223-27.

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<sup>25</sup>. In addition to the references above, information on health impacts from pesticide exposure was taken from various other sources, including: <http://www.chem-tox.com/> (Researching Effects of Chemicals on Health); <http://www.chem-tox.com/infertility/default.htm> (Infertility: The Environmental and Chemical Causes); <http://www.trufax.org/menu/chem.html#bioactive> (The Chemical Manipulation of Human Consciousness); and

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<http://www.igc.apc.org/panna/children/bibliography.html> (Children and Pesticides: Selected References)

<sup>26</sup>. Various, including: Roy G. Van Driesche and Thomas S. Bellows, Jr, eds., *Biological Control*. (New York: Chapman and Hall, 1996); Paul Debach and David Rosen, *Biological Control by Natural Enemies*, Second Edition (Cambridge: Cambridge University Press, 1991).

<sup>27</sup>. D. Pimentel, "Agriculture and Economics", In: Marcos Kogan, (ed.), *Ecological Theory and Integrated Pest Management*. (New York: John Wiley and Sons, 1986), pp. 299-319.

<sup>28</sup>. The study was done for OMAFRA.

<sup>29</sup>. Maureen Reilly, E-mail to Vijay Cuddeford, 15/10/98.

<sup>30</sup>. Maureen Reilly, *ibid*.

<sup>31</sup>. Maureen Reilly, "Papermill Sludge on Farmland: Have We Assessed the Risk?", unpublished paper; Cornell Waste Management Committee, "A Case for Caution". URL: <http://www.cfe.cornell.edu/wmi/PDFS/LandApp.pdf>

<sup>32</sup>. Letter to Jim Wheeler, OMAFRA from Brock Land Stewardship, Sept. 23, 1998.

<sup>33</sup>. Jim Chisholm, "Precaution is Needed for Sewage Sludge Applications to Agricultural Land", Unpublished paper, CUPE Local 79.

<sup>34</sup>. The study was carried out by GAP EnviroMicrobial Services in 1998 and funded by a number of agencies concerned about problems in the Maitland Valley watershed and along Lake Huron.

<sup>35</sup>. For more on the health problems associated with antibiotic resistant bacteria, and agriculture's contribution to the problem, see Toronto Board of Health, "Is Food the Next Public Health Challenge?", Date 1997.

<sup>36</sup>. "Cryptosporidium parvum and Cattle: Implications for Public Health and Land Use Restrictions", *Medical Ecology & Environmental Animal Health*, June 1995.

<sup>37</sup>. Midwest Sustainable Farming Group, *Inside the Beltway*, October '97. URL: <http://sunsite.unc.edu/pub/academic/agriculture/farming-connection/farmpoli/msawg/wash9710.htm>

<sup>38</sup>. A Statement from the Board of Directors of the National Catholic Rural Life Conference December 18, 1997. *An Immediate Moratorium on Large-scale Livestock and Poultry Animal Confinement Facilities*. URL: <http://www.moenviron.org/cafo.htm>.

<sup>39</sup>. Sierra Legal Defense Fund, Greenpeace Canada, Friends Of Clayoquot Sound and The David Suzuki Foundation, *Containing Disaster: Global Lessons on Salmon Aquaculture*, June 1997; Conservation Council of New Brunswick, *Pesticides in Salmon Aquaculture in Southwest New Brunswick*, a Background Paper Prepared for World Wildlife Fund Canada, December 22, 1997.

<sup>40</sup>. Based on OMAFRA and Environment Canada figures.

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<sup>41</sup>. Soil loss calculations based on data in Irene Shelton and G.J. Wall, Eds., *Indicators of Risk of Soil Degradation: the Erosion Component; the Risk of Soil Erosion in Canada*, Report No. 25 of the Agro-Environmental Indicator Project, Agriculture and Agri-Food Canada.

<sup>42</sup>. John Hendrickson, "Energy Use in the U.S. Food System: a summary of existing research and analysis", Center for Integrated Agricultural Systems, University of Wisconsin - Madison, WI, 1997.

<sup>43</sup>. Data compiled for the Environment Bureau, Agriculture and Agrifood Canada; A detailed report on ARS global change research appears in the July 1997 issue of ARS' Agricultural Research magazine. The report can also be found on the World Wide Web at: <http://www.ars.usda.gov/is/pr/gcindex0797.htm>. Sources: US Agricultural Research Service.

<sup>44</sup>. OMAFRA International Trade Statistics website:  
<http://www.gov.on.ca/OMAFRA/english/stats/trade/index.html>

<sup>45</sup>. J. Rissler. "Biotechnology and pest control: quick fix vs. sustainable control", *Global Pesticide Campaigner* 1:2, (1991), p. 1, 6-8.

<sup>46</sup>. M. Crouch, "Biotechnology is not compatible with sustainable agriculture", *J. Agricultural and Environmental Ethics* 8, (1995), p. 98-111.

<sup>47</sup>. See R.J. MacRae. et al, "Agricultural science and sustainable agriculture: a review of the existing scientific barriers to sustainable food production and potential solutions", *Biological Agriculture and Horticulture* 6, (1989), p.173-219.

<sup>48</sup> Brewster Kneen

<sup>49</sup>. Other BT-crops approved or awaiting approval in the USA include BT-corn and BT-cotton.

<sup>50</sup>. BT-resistance has been reported in Australia, the Phillipines, Taiwan, Thailand, Japan and the USA. The resistance is associated with repeated applications to crops and incorporation into crops. See The Pesticide Trust, "Pesticide threat to *Bacillus thuringiensis*", *Pesticide News* 21 (Sept. 1993), p. 14. Although the FDA has responded to concerns about increased BT-resistance by requiring companies with newly approved products to have strategies for reducing BT-resistance, these requirements are widely thought to be ineffective (Union of Concerned Scientists, "Managing resistance to Bt", *The Gene Exchange* 6:2/3 (1995), p. 4-7.)

<sup>51</sup>. How frequently is determined by a host of ecological factors specific to each farm and region. See E. Coleman, *The New Organic Grower* (Chelsea, VT: Chelsea Press, 1989); M. Smith et al, *The Real Dirt: farmers tell about organic and low-input practices in the Northeast*. (Burlington, VT: Northeast Region Sustainable Agriculture Research and Education Program, 1994).

<sup>52</sup>. Unfortunately, there is a long history in agriculture of new introductions that were supposed to perform a beneficial function, becoming pests. See M. Williams, "Purposefully introduced plants that have become noxious or poisonous weeds", *Weed Science* 28, (1980), p. 300-305; C. Turner, "Ecology of invasions by weeds", In: M.A. Altieri and M. Liebman (eds.) *Weed*

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<sup>53</sup>. J. Rissler. and M. Mellon, *Perils Amidst the Promise: ecological risks of transgenic crops in a global market* (Washington, D.C.: Union Of Concerned Scientists, 1993).

<sup>54</sup>. In drawing this conclusion, the authors contest the view of biotechnologists that their transgenic plants do not involve sufficient gene transfers to affect the multi-gene traits of weediness.

<sup>55</sup>. G. Douglass, "The meanings of agricultural sustainability." In: G. Douglass (ed.). *Agricultural Sustainability in a Changing World* (Boulder, CO: Westview Press, 1984), pp. 3-30.

<sup>56</sup>. R.B. Norgaard, "Coevolutionary agricultural development", *Economic Development and Cultural Change* 32, 1984, pp. 525-546; J.S. Dryzek, *Rational Ecology: environment and political economy* (Oxford: Basil Blackwell, 1987).

<sup>57</sup>. C. Campbell et al., "The role of nutrition professionals in the hunger debate", *Journal of the Canadian Dietetic Association*, 49, pp. 230-235.

<sup>58</sup>. Adapted from the Toronto Food Policy Council, *Setting a New Direction: changing Canada's agricultural policy making process*, March 1995.

<sup>59</sup>. N. Lampkin and S. Padel (eds.), *The Economics of Organic Farming* (Oxon: CAB International, 1994).

<sup>60</sup>. See, for example, reports from the Institute for Agricultural and Trade Policy, [www.iatp.org](http://www.iatp.org), and Toronto Food Policy Council, *Health, Wealth and the Environment: the impacts of the CUSTA, GATT and NAFTA on Canadian food security*, August, 1994.

<sup>61</sup>. Northwest Area Foundation, *A Better Row to Hoe: the economic, environmental, and social impact of sustainable agriculture* (St. Paul, MN: Northwest Area Foundation, St. Paul, 1994).

<sup>62</sup>. G.A. Goreham et al, "Community trade patterns of conventional and sustainable farmers", in E. Bird et al. (eds.), *Planting the Future: developing an agriculture that sustains land and community* (Ames, IA: Iowa University Press, Ames, 1995), pp. 131-146.

<sup>63</sup>. L. Kleinschmidt et al, *Community impacts of sustainable agriculture in Northern Cedar County, Nebraska* (Walthill, Nebraska: Center for Rural Affairs, 1994).

<sup>64</sup>. C.B. Flora, "Social capital and sustainability: agriculture and communities in the Great Plains and Corn Belt", *Journal Paper #J-16309*, Iowa Agriculture and Home Economics Experiment Station, Ames Iowa.

<sup>65</sup>. T.A. Lyson et al, "Farmers' markets and the local community: building the formal and informal economy", *American J. Alternative Agriculture*, 10, 1995, pp. 108-113.

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- <sup>66</sup>. Ontario Federation of Agriculture Website: <http://www.farmshow.ca/ofa/bullsh1.htm>. An overlooked aspect of OMAFRA cuts is that they will seriously hurt extension work. As some extension work does promote sustainable practices, this loss may increase non-sustainable practices and negative environmental impact.
- <sup>67</sup>. Jamie Rylett, office of Pat Hoy, provincial Liberal ag-critic. Conversation with Vijay Cuddeford, April 1998. Ontario Federation of Labour favours OMAFRA food safety inspections - OFA website: <http://www.ofa.on.ca/1/>
- <sup>68</sup>. OMAFRA, Summary of Contracted Projects, Grow Ontario Investment Program, September 1996 through March 1997.
- <sup>69</sup>. Canadian Environmental Law Association, *Submissions by the Canadian Environmental Law Association to the Ministry of Agriculture, Food and Rural Affairs on the Draft Discussion Paper on the Farm Practices Protection Act*, prepared by Donna Bigelow, February 1997.
- <sup>70</sup>. Mark S. Winfield and Greg Jenish, *Ontario's Environment and the 'Common Sense Revolution': A Second Year Report*, (Toronto: Canadian Institute of Environmental Law and Policy, 1997).
- <sup>71</sup>. OMAFRA, op cit.
- <sup>72</sup>. Winfield and Jenish, op cit.
- <sup>73</sup>. Ontario Ministry of Agriculture, Food and Rural Affairs, op cit.
- <sup>74</sup>. OMAFRA website: <http://www.gov.on.ca/OMAFRA/english/research/ario/contents.html>
- <sup>75</sup>. Ontario Government Business Plans - 1998-99, <http://www.gov.on.ca/MBS/english/press/plans98/omafra.html>
- <sup>76</sup>. We are referring here to those aspects of competitiveness which impact negatively on sustainability, e.g., those that contribute to negative environmental impact, destruction of rural communities, energy inefficiency (especially a food system designed to maximize exports and imports), and the rush to embrace new technology without fully considering the long-term impacts. In short, this type of competitiveness focuses on short-term profits at the expense of other considerations.
- <sup>77</sup>. Brian Cardy, manager, Rural Jobs Strategy, OMAFRA. Conversation with Vijay Cuddeford, April 1998.
- <sup>78</sup>. List of OMAFRA-funded research projects, provided by Ken Boyd, research manager, OMAFRA at Guelph.
- <sup>79</sup>. Ontario Ministry of Agriculture, Food and Rural Affairs website: <http://www.gov.on.ca/OMAFRA/english/research/ario/contents.html>
- <sup>80</sup>. Eva Ligeti, *Keep the door to environmental protection open: a special report to the Legislative Assembly of Ontario* (Toronto: Environmental Commissioner of Ontario, October 10, 1996).
- <sup>81</sup>. Testimonies of Paul McCulloch, Canadian Environmental Law Association, Roger Anderson and Dan Vanlondersele, Association of Municipalities of Ontario, and Bob Bedgood, Elbert van

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Donkersgoed, and Jasper Vanderbas of the Christian Farmers Federation of Ontario before the Standing Committee on Natural Resources Reviewing Bill 146, the Farming and Food Production Protection Act, February 17-19, 1997.

<sup>82</sup>. Donna Bigelow, *Submissions by CELA to the Ministry of Agriculture, Food, and rural Affairs on the draft discussion paper on the Farm Practices Protection Act* (Toronto: Canadian Environmental Law Association, February 1997).

<sup>83</sup>. Environmental Farm Coalition/OMAFRA, "Best Management Practices: Integrated Pest management." 1992.

<sup>84</sup>. Hugh Martin, OMAFRA. Conversation with Vijay Cuddeford, May 1998.

<sup>85</sup>. Craig Hunter, OMAFRA. Conversation with Vijay Cuddeford, May 1998.

<sup>86</sup>. Craig Hunter, OMAFRA. Conversation with Vijay Cuddeford, May 1998.

<sup>87</sup>. List of OMAFRA-funded research projects, provided by Ken Boyd, research manager, OMAFRA at Guelph.

<sup>88</sup>. Lorne Allmack, Secretary, Green Door Alliance. Conversation with Vijay Cuddeford, May 1998.

<sup>89</sup>. John Bacher, Preservation of Agricultural Lands Society (PALS), communication to MacRae and Cuddeford, June 1998; Kathleen Cooper, *Submissions of the Canadian Environmental Law Association to the Standing Committee on Resources Development Reviewing Bill 20, the Land Use Planning and Protection Act* (Toronto: Canadian Environmental Law Association, February 1996); CELA Brief #277: "Another change in Bill 20 is the concentration of power in the Minister of Municipal Affairs and Housing to determine whether matters are referred to the OMB. Another possible scenario could be development approvals in specialty crop lands with the Ministry of Agriculture and Food ... unable to appeal the matter to the OMB. The Ministry of Municipal Affairs is being given, in effect, a veto power over whether matters are to go to the OMB. Such judgements will be made in areas where the Ministry of Municipal Affairs does not have the relevant experience."

<sup>90</sup>. Jeff Cutton, Ministry of Energy and the Environment. Conversation with Vijay Cuddeford, May, 1998.

<sup>91</sup>. Jeff Cutton, MoE. Conversation with Vijay Cuddeford, May 1998.

<sup>92</sup>. OMAFRA, *Economic Information: Survey of Pesticide Use in Ontario, 1993*. Report No. 94-01.

<sup>93</sup>. Chisholm, op cit.

<sup>94</sup>. OMAFRA website: <http://www.gov.on.ca/OMAFRA/english/environment/ofec/coalition.htm>.

<sup>95</sup>. Joel Gruver, soil quality researcher, University of Maryland. Post to Sanet mailing list, 8/18/98.

<sup>96</sup>. Ontario Ministry of Finance, Motor Fuels and Tobacco Tax Branch, Information Bulletin 3212 - *Revocation of Clear Fuel Tax Refunds*, June 1993. Ministry of Finance form letter RE: *Refund allowances on fuel used in "Power Take-Off" operations*. Undated.

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<sup>97</sup>. OMAFRA, Summary of Contracted Projects, Grow Ontario Investment Program, September 1996 through March 1997.

<sup>98</sup>. Norris W. Hoag, Director of Research, Agricultural Research Institute of Ontario (ARIO), *Director's Report*

URL:<http://www.gov.on.ca/OMAFRA/english/research/ario/repdirec3%264.html>

<sup>99</sup>. Cf. T.W. Plumptre, *Beyond the Bottom Line: management in government*. (Halifax: Institute for Research in Public Policy, 1988).

<sup>100</sup>. See R.J. MacRae et al., 1990. "Policies, programs and regulations to support the transition to sustainable agriculture in Canada", *American Journal of Alternative Agriculture*, 5(2), pp. 76-92.

<sup>101</sup>. Chisholm, op cit.

<sup>102</sup>. Green Door Alliance, *A Conceptual Plan for Land Use Designation and Management of the Federal and Provincial Public Lands in Pickering, Markham and Uxbridge*. Scarborough: Green Door Alliance Inc. Revised version November 1996.

<sup>103</sup>. See Toronto Food Policy Council, *Setting a New Direction: changing Canada's agricultural policy making process*, op.cit.

<sup>104</sup>. Brad Gilmour, Ted Huffman, Andy Terauds and Charles Jefferson, op. cit.

<sup>105</sup>. Brad Gilmour, Ted Huffman, Andy Terauds and Charles Jefferson, ibid.









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**THE QUALITY OF AIR  
... WHAT WE CAN DO**

By Anna Tilman

Prepared for  
The Environmental Agenda for Ontario Project

March 1999

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## SUMMARY

### **Current Status**

The downward spiral that epitomizes the current status of air pollution issues in Ontario is the consequence of government policies, or absence thereof. While imposing drastic funding cuts in environment, health and research activities, both provincial and federal governments are relying on voluntary measures to reduce pollution. Not only have such actions led to deterioration in essential monitoring and inspection programmes, they signal a lack of fortitude by governments to assume their role and responsibility to protect the environment for future generations.

Despite sizable reductions achieved in sulphur dioxide (SO<sub>2</sub>) emissions over the last twenty years, acid rain continues to be a major concern. The recently introduced Ontario Smog Plan falls far short of being effective. Amongst other weaknesses, it fails to address the excessive and damaging levels of ozone and particulate matter that many communities are experiencing today. Climate change and greenhouse gas emissions do not even register on the provincial agenda, even though Ontario is a major consuming province. Emissions trading is currently becoming the favoured pollution reduction strategy on a global, national and provincial scale. Nevertheless, a cautious approach is warranted in adopting an untested market-based approach to emissions reduction that could result in environmental hotspots.

Federal-provincial initiatives such as the Acidifying Emissions Task Group and Sulphur Levels in Gasoline are examples of recent studies that compare various reduction scenarios in conjunction with the impact on human health, predicted cost benefits, and implicated expenses. However, lack of cooperation at the provincial level as well as some of the industrial sector often hamper implementation of the more stringent options or recommendations. Thus, the move to federal-provincial harmonization of regulations may well spell disaster for those provinces that display reluctance to institute meaningful regulations. In this respect, it remains to be seen how and what air quality objectives will be incorporated into current discussions on Canada-Wide-Standards for Particulate Matter and Ozone.

### **Cause of Problem**

Lack of commitment, political will and funding is the root cause of inaction. The failure to use economic models that account for the true costs of environmental degradation is coupled with the failure to come to grips with the necessary changes or shifts in so many facets of our culture and lifestyles. Governments have not shown the leadership required to facilitate such changes nor have they addressed the challenge posed by the intrinsic relationship between jobs and the economy, and health and the environment. Existing taxation policies and subsidies are regressive, protecting the status quo. The deployment of green taxes and incentives for innovative techniques that address environmental issues is dismissed in a climate in which taxes of any sort are anathema to politicians. No public

education programme or active campaign is directed at reducing pollution. While media coverage of environmental issues has increased, it is at best sporadic and cannot be relied upon as the sole source of information. In Ontario, the educational sector is being pressured to deliver tangible employable skills, as determined by a market-driven consumer psychology. As a result, courses on environment are not expanding and are becoming optional. The level of public consultation and collaboration in assisting to formulate policy and regulations is token, if at all, in Ontario.

### **Agenda for Change**

Ontario must alter course and direct its efforts to implement measures that improve air quality now. The setting of mandatory air quality standards along with stringent targets and timelines sends a clear signal of commitment to cleaner air and, at the very least, sets the stage for pollution reduction. An aggressive communication programme is needed to heighten public awareness as well as an increased level of public participation and consultation in decision-making and policy-setting processes. At the same time, government funding in environment must be enhanced to realize improvement in and support for monitoring programs and research. Creative new funding programs such as a provincial "Clean Air Fund" and/or "Atmospheric Fund" are needed to support and stimulate initiatives leading to emissions reduction, alternative energy sources, conservation projects, transportation strategies, and...cleaner air.

### **Key Recommendations**

Major recommendations in this paper for government action include the following:

- \* The province should adopt the following air quality standards as mandatory objectives:
  - a) place a cap on SO<sub>2</sub> emissions to ensure a 75% reduction of 1995 levels by 2015;
  - b) set the air quality objective for ozone at 50 ppb (one-hr average) by year 2005;
  - c) establish targets to reduce NO<sub>x</sub> emissions by 75% of 1995 levels by 2010; and
  - d) set objective levels at 25 µg/m<sup>3</sup> for PM<sub>10</sub> and 15 µg/m<sup>3</sup> for PM<sub>2.5</sub> (24-hr average).
- \* The province should restore and enhance funding of monitoring and inspection programs and specifically promote the use of Personal Exposure Monitors for PM<sub>2.5</sub>.
- \* The province should increase public participation in consultation processes, develop a communication strategy to heighten public awareness on air pollution issues and develop the mechanism to provide easy access to vital environmental information.
- \* The province should enact legislation that would:
  - \* reduce sulphur levels in gasoline to 30 ppm (maximum annual average) by 2002 and require sulphur content of gas to be posted at all filling stations; and
  - \* implement a mandatory vehicle Inspection Maintenance Program using up-to-date

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technology immediately in major urban areas and province-wide by April 19





**Author:**

Anna Tilman is Professor in Electronics and Computer Engineering, Seneca College, Toronto and a Senior Fellow in the Faculty of Environmental Studies, York University, Toronto. She holds a B.Sc. in Mathematics and Physics and an M.A. in Medical Biophysics, both from the University of Toronto. An advocate in social and environmental movements, her activities include serving as co-chair of STORM (Save the Oak Ridges Moraine) Coalition, involvement with provincial and national air quality issues and with the Commission of Environmental Cooperation on Continental Pollutant Pathways, Pollutant Registries, and Public Consultations.

**Acknowledgements:**

The author would like to acknowledge the following people for their advice, comments and review: Debbe Crandall (STORM Coalition), Martha Richardson (physician, Oak Ridges), Martha Kostuch (chair, Atmosphere Caucus, Canadian Environment Network), David Bell (York University Centre for Applied Sustainability), Laurie Orrett, John Jackson, Mark Winfield (Canadian Institute for Environmental Law and Policy), Bob Gibson (University of Waterloo), Elizabeth Wharton (Pesticide Action Group), Margaret Casey, Burkhard Mausberg, Irene Koch (Nuclear Awareness Project), and Ron Nielson (Pollution Probe).



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# THE QUALITY OF AIR ... WHAT WE CAN DO

## INTRODUCTION

### General Comments

In the last few decades, there has been growing public awareness and concern with the increase in air pollution and its impact on human health and the environment. According to public opinion surveys, the environment is identified as the second most important risk factor to human health, just behind lifestyle.<sup>1</sup> However, the vast scale of problems associated with pollution is so overwhelming that people regard the future with apprehension and uncertainty, and feel powerless to change the course of events. Disasters such as the Plastimet fire in Hamilton in 1997 and the ice storms in Eastern Ontario and Quebec in 1998 serve as wake-up calls and galvanize the public and media to demand explanations, investigations and action. With time, these episodes fade from the spotlight leaving many issues unresolved.

Air quality advisories, UV indexes and smog alerts are now routinely issued along with weather reports. According to the level of the readings, such advisories warn of the need to remain indoors, protect against the sun's UV rays, avoid strenuous physical activity, minimize the use of motorized vehicles, and so on. These precautions are usually directed to vulnerable populations, that is children, allergy sufferers, people with respiratory problems and the elderly. There is no explanation as to what these readings signify or how accurately they represent air quality, nor is there any feedback whether these advisories are effective in altering people's habits. Often forgotten are those with increased risk of exposure due to their work environment or geographical location. Implied in these warnings is a tacit assumption that such advisories are to be expected as part of our modern-day lifestyle and that being indoors is somehow healthier. While these advisories serve to raise public awareness, it remains to be seen if they influence government action.

The current direction of federal and provincial governments has resulted in the weakening of regulations and enforcement, particularly in Ontario. Cuts in government funding in environment, health and research, downloading to municipalities, and the harmonization of environmental regulations are indicative of the low priority of Environment in the overall spectrum of governance. The deference of all issues to the need for economic recovery reveals a lack of political will to deal with the most problematic issues facing a society dependent on a healthy ecosystem.

Our society has become deeply polarized between the influential industrial sector and those concerned with social and environmental issues; the most vulnerable populations are marginalized in the process. Many industries question the cost-effectiveness of additional pollution control measures in light of the lack of conclusive evidence on the

benefits to health, and the possible impact on jobs and the economy. Techniques such as risk management analysis are advocated in some quarters as a means of determining acceptable levels of exposure, despite studies indicating that there is no acceptable level or threshold value that will protect all of the population all of the time.<sup>2</sup>

Such sentiments are barriers to appropriately addressing the effects of pollutants on human health and the environment. The real economy operates within the constraints of the environment. Cleaner air, water and land inevitably leads to reduced health care costs and greater enjoyment of natural amenities, innovation and job creation.<sup>3</sup>

Provincial and federal environment commissioners have publicly criticized their respective governments for imposing funding cuts that ultimately endanger public health and for lack of concrete action to enforce pollution laws.<sup>4</sup> The Ontario Medical Association (OMA) has come out publicly in support of stronger action to fight air pollution and has attacked the government for promoting voluntary programs over mandatory standards.<sup>5</sup> Further fanning the flames, in a recent report on pollutant inventories Ontario was ranked as the third largest source of releases and transfers of pollutants among provinces and states in North America.<sup>6</sup>

It is time that government heeded their critics and re-assess their priorities. The consequences of inaction are far-reaching and may be irreversible.

### **Dynamics of Air Pollution**

The very essence of pollutants is their non-static behaviour. Several pollutants released into the atmosphere cycle continuously among air, land and water. Once deposited on land or water, they bioaccumulate through food webs, reaching humans at highly concentrated and harmful levels. The cumulative impact of exposure to more than one medium is very likely to heighten the risk to human and ecological health. Furthermore, while small amounts of some pollutants may have low toxicity in themselves, their reactivity with other substances can lead to the formation of highly toxic pollutants.<sup>7</sup>

The designation of air pollution into air issues such as acid rain and smog reflects the manner in which this whole topic has evolved. These categories seem somewhat arbitrary in light of the complexity of this topic. At the same time, the various air issues are inherently linked in that they have common sources, emit common pollutants, have similar impacts on health and the environment, and require similar remedies.

This paper provides a synopsis of several key air issues, with emphasis on acid rain and smog. The sources, pollutants, and implications on human health and the environment are detailed. Government initiatives and programmes pertaining to these issues are reviewed and critiqued. Specific recommendations are made with respect to developing government policies and action that are directed toward an environmental agenda for Ontario. Strategies that could be implemented in the short term are explored. While the focus is on the provincial government, jurisdiction for many air issues resides at local,

national, and international levels and recommendations and action need to be addressed accordingly.

## **ACID RAIN**

Acid rain is caused by emissions of sulphur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>), mostly as a result of human activity. In the atmosphere, these pollutants are transformed into diluted acids and then fall to earth in the form of rain, snow, fog, and mist, as well as acidic dust and particles. In eastern North America, sulphur compounds account for approximately two-thirds of acid deposition while nitrogen compounds account for the remaining one-third. Emissions of these compounds can be transported long distances and adversely affect virtually anything that they contact, such as water, soil, plants and structural material.<sup>8</sup>

In the 1970's, acid rain became the environmental issue in Canada. In Ontario, losses of fish population along with other disturbing changes in lakes and forests signaled a problem; the source of the problem was found to be acid rain. The ominous prospect of dying lakes and forests struck at the very fabric of Canadian identity.

In response to mounting public pressure, the Eastern Canada Acid Rain Program was initiated in 1985 as a joint federal/provincial undertaking. The programme's objective was to reduce sulphur deposition to an amount that would protect moderately sensitive ecosystems. To achieve this objective, the plan committed Eastern Canada to cap SO<sub>2</sub> emissions at 2.3 million tonnes by 1994, a 40% reduction from 1980 emission levels. Other acid rain control programmes in Canada and the United States have since come into play, primarily focusing on SO<sub>2</sub>. By 1996, SO<sub>2</sub> emissions dropped by 54% to 1.7 million tonnes. Yet acid rain continues to be a major concern for a number of reasons:<sup>9</sup>

- Emissions of nitrogen oxides (NO<sub>x</sub>) are only holding the line; this may be undermining the benefits of reduction of SO<sub>2</sub>. In fact, nitrate deposition has increased in the area from Lake Ontario to Quebec City.
- The acidity of precipitation has not decreased despite decreases in sulphate concentration, possibly as a result of the decrease in calcium and magnesium in precipitation, compounds that neutralize acid.
- Many of Canada's lakes, watersheds, soils, and forests have a natural tendency to be highly acid-sensitive and are not adequately protected by reductions alone.
- Fogs at high elevations are much more acidic than rain or snow, and more damaging to spruce trees and birches in these areas.
- More than 50% of acid deposition in Canada comes from sources in the United States.
- Emissions now reach higher altitudes, remain longer in the air, are spread more widely and are deposited much further from their source.<sup>10</sup>
- Higher levels of emission are now occurring in summer when increased electric power generation combined with more intense sunlight substantially increase the production of acid aerosols.<sup>11</sup>

- Deregulation of the electric industry leading to increased reliance on low-priced coal-fired power plants will cause increases in SO<sub>2</sub> and NO<sub>x</sub> emissions.<sup>12</sup>

While per cent reductions in emissions are given as indicators in the progress made in emission reduction, they should not mask the impact or significance of the total amount of emissions. Simply stated, the environment and effects on health respond to total pollutant loading. For example, in Ontario emissions for SO<sub>2</sub> and NO<sub>x</sub> in 1995 were approximately 640 kilotonnes and 540 kilotonnes respectively (25% of the total emissions in Canada).<sup>13</sup> These amounts are highly significant in themselves.

#### Acid Rain Terminology

- *Cap is the maximum allowable level for emissions.*
- *Critical load measures the threshold above which pollutant load harms the environment. Different regions have different critical loads.*
- *Target load is the amount of pollution deemed acceptable, taking into account ethics, scientific uncertainties, social, economic and environmental factors, but not regional sensitivity. It is the driver used to reduce emissions.*
- *Exceedance describes the difference between acid deposition and critical load.*

A large area of Ontario receives depositions exceeding the critical load. Tens of thousands of lakes remain damaged by acid rain and acid rain remains a significant problem.<sup>14</sup>

#### Emission Sources (Canada)

- smelters, oil and gas processing of sulphur-rich ores;
- electric power plants: burning of sulphur containing coals, heavy oil;
- other industrial sources: pulp and paper, aluminum production, petroleum refining, iron and steel production, manufacturing of nitric acid or nitrated materials;
- transportation (fossil fuel consumption, sulphur-containing fuels); and
- volcanic eruptions (natural).

The following table gives the estimates of emissions for SO<sub>2</sub> and NO<sub>x</sub> by source sector for Canada and United States for the year 1995:

Table 1: Estimates for SO<sub>2</sub> and NO<sub>x</sub> emissions, 1995:<sup>15</sup>

Sector	Canada		United States	
	SO <sub>2</sub> - %	NO <sub>x</sub> - %	SO <sub>2</sub> - %	NO <sub>x</sub> - %
<b>Electric Utilities</b>	22	10	65	30
<b>Industrial</b>	69	25	28	17



<b>Mobile</b>	4	<b>60</b>	3	48
<b>Other</b>	5	5	4	5
<b>Total (million tonnes)</b>	2.65	2.0	16.5	21.6

Note: In Canada, the mobile sector is the primary source of NO<sub>x</sub> whereas the industrial sector is the major source of SO<sub>2</sub> emissions.

### **Human Health Effects** <sup>16</sup>

SO<sub>2</sub> reacts with other chemicals in the air forming toxic pollutants. NO<sub>x</sub> is a precursor for the formation of ground-level ozone, a major component in smog. Both SO<sub>2</sub> and NO<sub>x</sub> contribute to the formation of fine particles suspended in air, known as acid aerosols. Sulphate aerosols, less than 1 micron in diameter, constitute a major fraction of smaller particles in the air and are particularly harmful to health because they readily penetrate the lungs.

The effects of acid rain on health include:

- cardiorespiratory damage;
- increased sensitivity for individuals with bronchitis and asthma;
- chronic bronchitis; and
- increase in premature mortality from cardiopulmonary diseases.

### **Environmental Impacts** <sup>17</sup>

- acidification of lakes and soils;
- acceleration of metal corrosion;
- erosion of limestone, marble, and chalk building materials;
- decline in availability of nutrients in the soil;
- forest damage: leaf damage, reduction in tree vitality and regeneration (growth in hardwood forests reduced by 30%, coniferous forests by 10%);
- increased transparency to UV rays in lakes, harming fish species and aquatic life;
- mobilization of toxic heavy metals from soil and bedrock; and
- reduced visibility.

### **Acid Rain Control Programmes and Initiatives**

**"Towards a National Acid Rain Strategy", Acidifying Emissions Task Group (AETG), October, 1997** <sup>18</sup>

This multi-stakeholder task group, initiated by the National Air Issues Coordinating Committee (NAICC) in 1994, consisted of representatives from provincial and federal governments, industry, health and environmental groups across Canada. After nearly three years, the Task Group came to agreement on principles such as keeping clean areas clean, pollution prevention, and the need to develop a strategy to reduce nitrogen

deposition, but failed to reach consensus on recommendations for targets and schedules. Health and environment groups recommended emission reduction targets and schedules in stages that would result in a 75% reduction in SO<sub>2</sub> emissions below present caps by 2015. Ontario presented the greatest obstacle to proposed reduction scenarios and would not commit to keep their emissions from increasing. This was even more remarkable as emissions in Ontario are currently 25% below the cap. Representatives from industry were skeptical of the science and the validity of the cost benefits. They voiced concern about costs of implementation and losing the competitive edge, and questioned the merit of unilateral action by Canada.

The AETG report highlighted future potential cost benefits and human health effects associated with various SO<sub>2</sub> emission reduction scenarios, as shown in Table 2:

**Table 2: Cost Benefits and Human Health Effects Scenarios (2010- 2015)<sup>19</sup>**

<b>Adverse Health Effects (adapted from the Health Effects Pyramid)</b>	<b>Scenario 1 25% SO<sub>2</sub> reduction Canada &amp; US No. of cases</b>	<b>Scenario 2(b) 50% SO<sub>2</sub> reduction Canada only No. of cases</b>	<b>Scenario 3 75% SO<sub>2</sub> reduction Canada &amp; US No. of cases</b>
Mortality	200	200	830
Airway Obstructive Disease	710	730	2900
Hospital Admissions (respiratory & cardio)	230	240	950
Emergency Room Visits	560	580	2300
Asthma Symptom Days	77,300	79,300	316,900
Restricted Activity Days	110,270	113,500	451,800
Acute Respiratory Symptom Days	2,691,000	2,760,000	11,034,000
Child Bronchitis (cases)	9,600	9,800	39,400
<b>Total Benefits(\$M)<sup>1</sup></b>	<b>210-2000</b>	<b>220-2000</b>	<b>890-8000</b>

<sup>1</sup> Total Benefits in \$ Millions include an aggregate of environmental and social impacts, changes in well-being or damages and willingness to pay.

Scenario 3 was based on modeling predictions that indicated the need for 75% emission reductions of SO<sub>2</sub> in eastern Canada and the United States to fully protect the most sensitive areas and thereby achieve critical loads everywhere in eastern Canada.<sup>20</sup> The advantages of this Scenario over other options are evident.

The story on NO<sub>x</sub> emissions is not encouraging. While smog plans in Canada and the US predict that reductions in the order of 45% in NO<sub>x</sub> emissions would ameliorate acidification, the status of such plans is not clear. Furthermore, the benefits arising from

reduction in nitrate deposition can not be quantified, as critical loads have not yet been established. At present, only an interim arbitrary target load of 10 kg/ha/yr exists.<sup>21</sup>

To date, no government has acted on the report's findings or conclusions.

### Other Initiatives - Highlights

- a) **US Clean Air Act (CAA):** The CAA, implemented by the Environment Protection Agency (EPA), was amended in 1990 to cut SO<sub>2</sub> emissions by 40% from 1980 levels by the year 2010 and NO<sub>x</sub> emissions by 10% by 2000. The intention was to protect moderately sensitive ecosystems in the eastern United States. It introduced a SO<sub>2</sub> allowance trading system and called for regional control strategies, such as a NO<sub>x</sub> trading programme and low-emissions vehicle programme.<sup>22</sup>
- b) **Canada - US Air Quality Agreement, 1991:** This agreement was designed to control transboundary air pollution. The initial focus was on acid rain.<sup>23</sup>

**Table 3: Commitments under the Canada - United States Air Quality Agreement**

<b>Commitment</b>	<b>Compliance</b>
<b>Canada</b>	
Cap SO <sub>2</sub> emissions in 7 eastern provinces at 2.3 million tonnes by 1994 until 2000	24% under cap in 1996
Cap national SO <sub>2</sub> emissions at 3.4 million tonnes by 2000 onward	17% under cap in 1996
Reduce NO <sub>x</sub> emissions from stationary sources by 10% (from year 2000 forecast)	On schedule
<b>United States</b>	
Reduce SO <sub>2</sub> emissions from 1980 levels by 9 million tonnes by 2000	On schedule
Reduce NO <sub>x</sub> emissions from 1980 levels by 1.8 million tonnes by 2000	On schedule

- c) **UN Protocols:** Signed under the auspices of the United Nations Economic Commission for Europe (UN ECE), these protocols addressed emissions caps for SO<sub>2</sub> and NO<sub>x</sub>. The 1994 sulphur protocol set a cap on SO<sub>2</sub> emissions in sensitive regions of eastern Canada at 1.75 million tonnes by 2000. The NO<sub>x</sub> Protocol committed to stabilize NO<sub>x</sub> emissions.<sup>24</sup>

While these commitments represent an initial step in addressing air pollution issues and policies, they are relatively ineffective when one considers the severity of the problem, the level of commitment and the relative ease of achieving compliance.

## Recommendations:

- \* Ontario, through the Ministry of Environment, should review and re-assess critical loads and target loads to ensure that:
  - a) critical loads reflect the sensitivity of the watershed to the highest level of confidence and are routinely re-evaluated; and
  - b) target loads function as objectives and are set at or below critical loads.
- \* The province should enact measures that would:
  - a) limit SO<sub>2</sub> emissions from exceeding current levels (now 25% below cap);
  - b) establish stringent targets and schedules resulting in a 75% reduction in SO<sub>2</sub> emissions below current cap by 2015; and
  - c) ensure that:
    - 1) critical loads for nitrogen deposition are established; and
    - 2) a strategy is in place by 2000 to reduce nitrogen deposition to critical loads.

## SMOG

A term coined from smoke and fog, smog refers to the toxic soup we breathe, affecting our health and quality of life. Smog is the air issue with the greatest visibility and public awareness at this time. By addressing the sources and components of smog, significant improvements in air quality could be realized.

Smog is a complex combination of pollutants that is often found but not limited to large urban areas. The composition and concentration of smog vary with local conditions, sunlight, and other factors. These components can be transported downwind by air currents, affecting rural and other urban areas over distances that range from several hundred to a few thousand kilometres. While components of smog include ozone, particulate matter, gases such as sulphur oxides, nitrogen oxides, carbon monoxide and acid aerosols, the primary constituents are ground-level ozone and particulate matter.

## Ozone

**Ozone** (O<sub>3</sub>) is an odourless, tasteless, highly reactive and unstable form of oxygen. Ozone is formed by the reaction of nitrogen oxides (NO<sub>x</sub>) with volatile organic compounds (VOCs) in the presence of sunlight. Given certain conditions such as warm sunny days, traffic, industrial emissions, slow moving air masses, and lack of precipitation, the formation of ozone and smog is greatly enhanced. Volatile Organic Compounds (VOCs) refer to organic compounds (hydrocarbons) that are highly reactive in sunlight, and generally short-lived. VOCs include substances such as benzene, acetone, propane, chloroform, and toluene. VOCs may be absorbed in particles, transported to rural areas, and released with temperature rise during the day, further enhancing ozone formation.

Since ozone and its precursors (NO<sub>x</sub> and VOCs) can travel relatively long distances in the atmosphere, they can aggravate conditions in areas where local emissions may be only moderate. For example, some of the ozone created in the Ohio Valley by emissions of NO<sub>x</sub> and VOCs from the midwestern United States flows into Canada, raising ozone levels in Southern Ontario.<sup>25</sup>

### **Emission Sources**

**NO<sub>x</sub> emissions** are primarily associated with combustion of fossil fuels and industrial processes. Sources include the transportation sector (more than 60% of the emissions in Canada), electric power plants, and non-industrial fuel combustion. Natural sources are considered negligible.

**VOCs** are emitted primarily from natural sources (vegetation, forest fires, and animals). Anthropogenic sources are mainly from combustion, incineration, various industrial processes, evaporation of liquid fuels, paints and solvents, and organic chemicals. Transportation and industrial sources are the largest contributors. While biogenic emissions play an important role, anthropogenic VOCs emissions dominate during ozone episodes in the most populated smog-affected regions of Canada.<sup>26</sup>

### **Ambient Air Levels (ground-level ozone)<sup>27</sup>**

Ground-level ozone occurs naturally, ranging anywhere between 25-45 ppb.

Currently, Canada has set an ambient air quality objective for ground-level ozone of 82 ppb as the maximum daily average over a one-hour period. This objective does not represent a mandatory standard. The Ontario guideline, or criterion, is 80 ppb. (The difference in these values is due to unit conversion and rounding and is insignificant.) More than half of all Canadians experience exceedances well beyond this objective, particularly in the summer months. Lakeshore sites in southwestern Ontario (e.g., Long Point) record the highest number of ozone exceedances, routinely experiencing levels greater than 120 ppb. Air quality at levels greater than 80 ppb is generally described as "poor" and is clearly associated with adverse health effects and related symptoms. An ozone level of 50 ppb is considered to represent "fair" air quality.<sup>28</sup>

### **Human Health Effects**

Research in the US and Canada has repeatedly documented a strong correlation between high ozone levels and rates of hospitalization and worker absenteeism.<sup>29</sup> Ontario studies have shown that in the months May to August, approximately five per cent of daily respiratory hospital admissions are associated with ozone. Other findings have shown hospital admissions linked to ozone occurring at levels well below the current national air quality objective of 82 ppb, with the probability and severity of health effects increasing with increasing exposure.<sup>30</sup> Furthermore, it appears that there is no human health threshold for ozone, that is, there is no level that can be deemed safe.<sup>31</sup> Populations more

sensitive to ozone exposure include young children, the elderly, people with respiratory problems, and people active outdoors, particularly in the summer.

Impacts on human health related to high ozone levels are summarized below:

- respiratory system:
  - lung functioning (coughing, shortness of breath, pain on inspiration, throat irritation, wheezing, chest tightness);
  - chronic and acute bronchitis, asthma; and
  - pulmonary emphysema;
- possible interference with the immune system; and
- headaches, burning eyes, irritated sinuses.

### **Environmental Effects**<sup>32</sup>

- damage to lungs and respiration of animals;
- injury to foliage, reducing the yield in sensitive crops (observed at ozone levels of about 60 ppb);
- increased susceptibility to diseases and other stresses in plants and tree species; and
- increased mortality to individual trees and decline of species.

### **Particulate Matter (PM)**<sup>33</sup>

Particles are a key component in many atmospheric processes and directly related to a number of critical environmental issues including smog, acid deposition, decrease in visibility, hazardous air pollutants, and climate change. Particulate matter (PM) describes microscopic airborne liquid and solid particles that range from approximately 0.005  $\mu\text{m}$  to 100  $\mu\text{m}$  in diameter. (A human hair is typically 70  $\mu\text{m}$ .) These particles are classed as total suspended particulates (TSP), although PM is now the preferred term.

Size is the most important parameter in characterizing the behaviour of particulate matter. As more scientific information is obtained about PM, attention has focused on consecutively smaller particles. The tendency of these particles to remain in the air for days and even weeks and to penetrate into the lungs is indicative of the very significant impact of PM on health and ecosystems. Particles of greatest concern are those with a diameter less than 10  $\mu\text{m}$ , referred to as  $\text{PM}_{10}$ .

$\text{PM}_{10}$  is divided into two distinct modes or fractions of particles:

- Coarse mode includes particles with diameters between 2.5  $\mu\text{m}$  and 10  $\mu\text{m}$ . They include soil dust, inorganic and organic compounds and metals.
- Fine mode, or  $\text{PM}_{2.5}$  are particles with diameter 2.5  $\mu\text{m}$  or less. Components include sulphates, nitrates, ammonia, and VOCs, the most abundant being sulphates. Ultrafine particles (< 0.1  $\mu\text{m}$  in diameter) behave like gases, do not settle and remain in the

respiratory tract for lengthy periods.

**Sources of PM:** (illustrated in table below)

**Table 4: Sources of Particulate Matter** <sup>34</sup>

Particle size	Natural		Anthropogenic	
	Primary <sup>a</sup>	Secondary <sup>b</sup>	Primary	Secondary
<b>Fine PM</b>	Wildfires (high temp. sources)	itrates (natural NOx emissions, e.g., soil processes)  VOCs (biogenic)	Fossil Fuels: power plants, vehicles industrial/residential boilers, heaters	VOCs: vehicles industrial processes solvents Sulphates, Nitrates: power plants, vehicles
<b>Coarse PM</b>	Windblown dust Mineral Particles Sea Salt Spray Volcanic Dust Forest fire debris		Road and construction dust Mineral dust (mining and extraction) Windblown agricultural soil	

<sup>a</sup> Primary particles: particles emitted directly into the atmosphere    <sup>b</sup> Secondary particles: particles formed in the atmosphere

PM<sub>10</sub> accounts for approximately 50% of Total Suspended Particulates (TSP), while PM<sub>2.5</sub> accounts for half of the total amount of PM<sub>10</sub> (or 25% of TSP).

### Ambient Air Levels of PM <sup>35</sup>

PM levels or concentrations are expressed in micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) averaged over a 24-hour period. The range of background levels of PM<sub>10</sub> is about 4 to 11  $\mu\text{g}/\text{m}^3$  and 1 to 5  $\mu\text{g}/\text{m}^3$  for PM<sub>2.5</sub> in remote sites in North America. In most urban sites across Canada, PM<sub>10</sub> levels can range anywhere from about 20 to 42  $\mu\text{g}/\text{m}^3$  while PM<sub>2.5</sub> levels range from 8 to 20  $\mu\text{g}/\text{m}^3$ . These ranges are substantially above background levels, indicating the significant influence of anthropogenic sources on ambient PM loadings. Current ambient levels of PM in most regions of Canada, particularly urban centres in summer months, exceed levels associated with adverse cardiorespiratory health problems on a regular basis.

There are no national or provincial air quality objectives that specifically address PM<sub>10</sub> or PM<sub>2.5</sub>. The current air quality objective in Canada related to particulate matter is only a guideline, expressed in terms of Total Suspended Particulates (TSP), and is set at a maximum 24-hour level of 120  $\mu\text{g}/\text{m}^3$ . The level of TSP is not an appropriate indicator of PM in that it does not reflect particle size and it is the smaller particles that are the most

detrimental to health and the environment.

### **Human Health Effects**<sup>36</sup>

There is no doubt today that PM is emerging as a critical health issue. PM<sub>2.5</sub> penetrates deeply into regions of the lungs where there are no cilia and no mechanisms to remove contaminants. Low levels of ambient PM have been found to particularly affect susceptible individuals such as the elderly, children, and people with pre-existing disease. As PM levels rise, so do adverse health effects, placing healthy individuals at risk. In general, observed effects include:

- cardiorespiratory diseases: increase in mortality, hospitalization;
- decrease of lung function in children and in asthmatic adults;
- increase in respiratory stress, leading to restriction in physical activities, absenteeism from school and work; and
- increase in development of chronic bronchitis and asthma.

The epidemiological evidence for mortality and morbidity effects of current ambient levels of PM is strong, consistent and compelling. Hospitalization and mortality studies in southern Ontario and the U.S. have demonstrated a clear association between an increase in adverse health effects and PM. Increases in hospitalization and mortality rates were found to be significant at PM<sub>2.5</sub> and PM<sub>10</sub> levels within the range of 15 µg/m<sup>3</sup> and 25 µg/m<sup>3</sup> respectively, with no evidence of a safe value or threshold.<sup>37</sup>

The lack of a threshold suggests that it is not possible to identify a level at which no adverse effects would occur as a result of exposure to PM. Furthermore, the long-term effects on the general population in health and quality of life from chronic exposure to PM may be far greater than has been considered.

Whether or not PM is the causal agent of the cardio-respiratory impacts, PM<sub>2.5</sub> is the most appropriate indicator at this time to which adverse health effects are attributed. Sufficient information exists to warrant strategies to reduce emissions of PM and its precursor gases.<sup>38</sup>

A recent in-depth study by the federal-provincial working group under the Canadian Environmental Protection Act has identified reference levels for PM to be "levels above which effects on human health and the environment can be demonstrated". Based on existing evidence, the recommended reference levels derived for PM are: 25 µg/m<sup>3</sup> for PM<sub>10</sub> and 15 µg/m<sup>3</sup> for PM<sub>2.5</sub>.<sup>39</sup>

Many urban sites experience maximum exposure values greater than 100 µg/m<sup>3</sup>, particularly in the Windsor-Quebec City corridor. The following table highlights some of the hotspots in Ontario with respect to PM along with related mortality and hospital admission figures.



**Table 5: The Ontario PM Hotspots and related mortality and hospitalization** <sup>40</sup>

Location	PM <sub>10</sub> 24-hour maximum µg/m <sup>3</sup>	PM <sub>10</sub> Impacts mortality (per million)	PM <sub>2.5</sub> 24-hour maximum µg/m <sup>3</sup>	PM <sub>2.5</sub> Impacts Mortality (per million)	PM <sub>2.5</sub> : Hospital Admissions (per million)
Windsor	105	49	86	52	24
Toronto	102	37	67	45	20
Hamilton	105	51	61	64	29
Walpole Is.	<b>150</b>	<b>80</b>	<b>127</b>	<b>41</b>	<b>35</b>

(Science Assessment Document, CEPA/WGAGOG August, 1997)

The maximum PM<sub>2.5</sub> 24-hour value across Canada is at Walpole Island, a native reserve in Lake St. Clair, and the highest urban site is at Windsor. Considering the evidence indicated, and that long-term chronic exposure is not known, levels of this magnitude are not tolerable.

#### **Environmental and Other Impacts** <sup>41</sup>

**Animal Toxicity:** Animals have exhibited reduction in lung clearance, alterations in immunological responses and have experienced a possible onset of chronic alveolitis, fibrosis and lung cancer.

**Reduced visibility:** PM refracts, reflects or absorbs light, creating a regional haze that reduces visibility both in urban environments and parks and wilderness areas. Reduced visibility is generally associated with poor air quality.

**Vegetation:** PM causes smothering of leaves by blocking stomata, biochemical interactions, soil effects, and susceptibility to disease.

**Materials:** Increased rates of physical and chemical degradation (accelerated rate of corrosion, erosion, soiling and discoloration) have been observed.

#### **Government Plans and Initiatives**

##### **a) NO<sub>x</sub>/VOCs Management Plan** <sup>42</sup>

This plan was undertaken in 1990 to address the smog problem at a national level. Its objectives were to reduce ground-level ozone to ensure attainment of the objective of 82 ppb (maximum one-hour average) and to develop guidelines to reduce NO<sub>x</sub> and VOCs emissions for the target years 2000 and 2005. Extensive consultations and scientific studies were utilized as a basis to formulate the plan.

In order to achieve the stated goals, reductions of NO<sub>x</sub> and VOCs in the order of 50% would be needed.<sup>43</sup> In light of the slight decrease in annual NO<sub>x</sub> emissions that occurred between 1990 to 1995 (from 2.1 to 2 million tonnes), the ability to achieve these reductions seems questionable. The government was to proceed into the next phase of a National Smog Management Plan. However, development of the plan was ended in 1997 as provinces, particularly BC and Ontario, indicated that they were unable to meet the time frame and would pursue their own response to the smog challenge.

#### **b) Ontario Smog Plan**<sup>44</sup>

The Ontario Ministry of Environment has estimated that that about 1800 premature deaths per year in Ontario can be attributed to smog (MOE, May 1997). Toronto residents faced 52 exceedances of the hourly ozone limits in 1995. The transportation sector is clearly identified as responsible for about 60% of local smog-causing emissions. After almost two years of consultation, in January, 1998, the provincial government released its response to the smog problem, namely the Ontario Smog Plan. The Plan is a voluntary agreement that sets an Air Quality Target for Smog representing a 75% reduction in the number of exceedances above the 80 ppb ozone criterion by the year 2015. There are several shortcomings to this plan:

- The Plan is not backed up with actions from other government departments, most notably the Ministry of Transportation nor are there any financial commitments from the MOE or the provincial government.
- The MOE has estimated that emissions of NO<sub>x</sub> and VOCs will have to be reduced by 45% (from 1990 levels) to meet the goal of the Smog Plan. However, analysis of reduction plans indicate that they fall short of the 45% goal. Furthermore, the premise that a 45% reduction of NO<sub>x</sub> and VOCs will be enough to improve air quality is doubtful.
- Smog-causing emissions from the US have not been taken into account.
- The Plan is drawn out over 17 years. This lax timetable reduces the emphasis on energy efficiency programs and commitment to renewable energy sources.
- The impact of Particulate Matter (PM) has been virtually ignored.
- No mechanism exists to set interim targets, monitor progress, or engage the public.

The Plan has been designed in a regulatory vacuum with no clear incentives to support voluntary action. Environmental and health groups have refused to sign the Smog Plan, as they say the reduction target is too low, the time frame too slow, and the Plan too weak to be effective. The Toronto Environmental Alliance has recommended that: "MOE adopt immediately an interim air quality standard for PM<sub>2.5</sub> of 15 µg/m<sup>3</sup>. All health evidence points to the fact that while these interim standards may not be high enough to protect human health from fine particle pollution - the MOE risks little in introducing these standards." <sup>45</sup>

#### **c) Canada-Wide Standards (CWS) for Particulate Matter and Ozone**<sup>46</sup>

A federal/provincial/territorial development committee has been established to propose CWS for PM and Ozone by the fall of 1999. This latest initiative receives its mandate from the Canada-Wide Accord on Harmonization. The committee is to recommend targets and time frames that are "achievable...based on sound science and the evaluation of risk to human health and the environment, recognizing environmental and socio-economic considerations". It remains to be seen if and how air quality objectives on ozone and PM will be incorporated into the new CWS, whether they are stringent enough to improve air quality, and what level of action or legislation would accompany such objectives.

### **Recommendations:**

- \* In light of evidence that the current air quality criterion for ground-level ozone in Ontario does not adequately protect health or vegetation, the province should adopt the following policies and actions:
  - a) replace its present air quality criterion of 80 ppb by an air quality objective of 50 ppb (one-hour average) as a mandatory standard;
  - b) set a goal of zero exceedance across the province by 2005;
  - c) accelerate timelines and establish more stringent targets in those communities with the highest level of exceedances;
  - d) impose restrictions on the operation of facilities and activities that enhance ozone production and elevate ozone levels; and
  - e) set mandatory targets and timetables to reduce NO<sub>x</sub> emissions by 50% of 1995 levels in the year 2005, and by 75% no later than 2010.
  
- \* In light of the lack of any national or provincial standard for PM, the province should adopt the following policies and actions:
  - a) adopt the reference levels of 25 µg/m<sup>3</sup> for PM<sub>10</sub> and 15 µg/m<sup>3</sup> for PM<sub>2.5</sub> (24-hour average) as mandatory air quality objectives for PM in Ontario;
  - b) establish more stringent targets with accelerated timelines in those communities with the highest levels of PM;
  - c) support and fund studies that examine the effects of long term or chronic exposure to PM on health endpoints; and
  - d) promote the use of personal exposure monitors to better characterize individual exposures to PM<sub>2.5</sub>, particularly for vulnerable populations.

### **HAZARDOUS AIR POLLUTANTS (HAPs) <sup>47</sup>**

HAPs, or air toxics, are atmospheric pollutants defined as "gaseous, aerosol or particulate contaminants present in the ambient air in trace amounts with characteristic toxicity and persistence so as to be a hazard to human health, or plant and animal life." HAPs include chemicals and families of chemicals, such as: PCBs, dioxins, benzene, heavy metals and

compounds known as persistent organic pollutants.

### **Persistent Organic Pollutants (POPs)** <sup>48</sup>

POPs are a diverse group of toxic organic compounds of natural or anthropogenic origin that share a number of generic characteristics. POPs degrade very slowly or not at all into the environment and their persistence is media-specific, in that they may degrade in the atmosphere in a matter of weeks, but their degradation in soils or sediments may take decades, if at all. POPs are present in the atmosphere both in gaseous form and associated with particles, and have the potential of being transported worldwide. POPs can re-evaporate after being deposited to the earth's surface, and cycle repeatedly between atmosphere and surface, eventually concentrating in water, soil and wildlife in cooler northern latitudes. This tendency to re-volatize many times is referred to as the grasshopper effect.<sup>49</sup>

### **Sources of POPs**

POPs include chemicals deliberately produced as well as those generated as unintended by-products in production, combustion and breakdown processes and include:

- pesticides, e.g., DDT, chlordane, toxaphene, mirex, lindane;
- industrial chemicals, e.g., PCBs, hexachlorobenzene; and
- byproducts of industrial combustion processes, bleaching processes, diesel exhaust, incineration of municipal and medical waste - e.g. dioxins and furans, polycyclic aromatic hydrocarbons (PAHs).

### **Human Health Effects**

POPs dissolve more easily in fat than water and accumulate in the fatty tissue of living organisms leading to their bioaccumulation in the food chain. The dominant route of human exposure is through eating fish and other wildlife. POPs can also accumulate via inhalation and skin exposure. Some POPs, such as dioxin, bioaccumulate through terrestrial food webs, concentrating in milk and other dairy products. POPs are a problem particularly to those populations (including indigenous peoples in the North) whose diet relies primarily on such foods and especially to pregnant women in those communities. The diversity of POPs and their toxicity contribute to a wide range of effects such as:

- immunosuppression;
- liver and kidney toxicity, neurotoxicity (effects in off-spring);
- cancer and mutagenicity; and
- diminished reproductive capacities, developmental abnormalities, and hormone disruption.

Further examples of the insidious nature of POPs are include:

#### **\* Endocrine Disruption:**

The general population is at risk from exposure to POPs due to the ability of some POPs to act as endocrine disrupters, mimicking the body's hormones, turning on and off important development processes at critical times. It is believed that fetal exposure to endocrine disrupters or estrogenic chemicals (including 2,4-D, DDT, PCBs, dioxins and furans) may be responsible for declining sperm counts and the increase in abnormalities in the human male reproductive tract. Women and children are generally at special risk because of the transfer of these contaminants through the placenta and breast milk.<sup>50</sup>

**\* PAHs (polycyclic aromatic hydrocarbons):**

Diesel exhaust is a major source of PAHs, chemicals known to cause mutations in cells and cancer in animals. In addition, diesel engines are a potent source of very fine particulates that are able to carry PAHs and easily penetrate the lung. People exposed to diesel exhaust in their occupations have an increased risk of lung cancer.<sup>51</sup>

**\* Biological Effects** include compromising the ability of organisms to reproduce and develop normally, a decrease in egg production, eggshell thinning, embryonic deformities, gender blurring (or demasculinization), and growth retardation in birds and fish. The use of pesticides stresses and weakens plants increasing susceptibility to insect and fungal damage.

**Recommendations:**

- \* The province should adopt measures to ensure that the deliberate manufacturing and use of POPs are phased out in stages with a goal of total elimination by the year 2010 or sooner and that the disposal of POPs is appropriately regulated.
- \* The province should support and promote non-polluting alternatives to POPs and provide the necessary public education and retraining programmes for affected workers.

**MERCURY - MULTIMEDIA POLLUTANT**<sup>52</sup>

While mercury falls under the classification of Heavy Metals, it was chosen as a focus for this category as an example of a substance pervasive in all media.

Mercury (Hg) is a highly volatile metal and is found in air, water, land, and biota. Mercury resides in the atmosphere in a gaseous form for a period ranging from three months to two years. In water, a significant fraction of inorganic mercury is transformed into an organic form, methylmercury (CH<sub>3</sub>-Hg). This transformation has been increased by the acidified condition of many water bodies. Methylmercury is the most toxic and available form of Hg for living organisms and bioaccumulates through the food web to fish-eating mammals to levels thousands of times greater than in water.

In the last 100 years, the level of atmospheric mercury has increased by two to five times

with anthropogenic sources accounting for anywhere from 50 to 70% of the total emissions. Approximately 60% of emissions are transported by long-range atmospheric processes. A major atmospheric pathway of mercury into Canada is from the Atlantic Coast of the US. The Great Lakes basin is also affected by the increased use of coal by electric utilities in the U.S. Midwest.

### **Sources**

- coal-fired electric plants;
- waste incinerators (municipal, medical), and landfills;
- chlor-alkali facilities (mercury cell processes);
- copper and lead smelters;
- cement manufacturers; and
- products containing mercury (fluorescent light tubes, thermostats, thermometers, dental amalgams and batteries).

### **Human Health and Environmental Effects**

- Exposure to inorganic mercury can cause liver and kidney damage.
- Methylmercury is a potent neurotoxic, causing impairment of the central nervous system leading to loss of sensation, tunnel vision, lack of coordination, impairment of speech, hearing and gait, tremors and hallucination. It is fetotoxic, affecting embryonic development and causing fetal malformations.
- Human populations at risk include pregnant women, developing fetuses, nursing infants, young children and populations where fish is a major food source.
- Environmental effects include the inhibition of photosynthesis and growth in phytoplankton and reproductive failure and death in birds.

In recognition of the multi-media nature of the mercury problem and its global ramifications, numerous organizations are working collaboratively on developing a comprehensive assessment of the problems and strategies to address public health and environmental issues. A Heavy Metals Protocol was developed by the UN in 1996 to control emissions and an International Conference on Mercury as a Global Pollutant is scheduled for May, 1999. These efforts could influence provincial actions and strategies to aggressively address the mercury problem.

### **Recommendations:**

- \* The province should enact the appropriate legislation to reduce mercury emissions and work toward its virtual elimination. In this regard, Ontario should:
  - \* improve monitoring programs to eliminate major discrepancies and information gaps; in particular, augment fish monitoring programs, fish consumption advisories and improve data collection on fish and wildlife;
  - \* cooperate with other jurisdictions on the effects of long-range transport and the ensuing impact on health, particularly for sensitive populations;

- \* implement mandatory recycling, recovery and disposal programs to eliminate mercury in waste; and
- \* identify and label products containing mercury and phase out their use.

## RADIOACTIVE POLLUTION <sup>53</sup>

Like any other thermal energy-generating facility, nuclear plants emit pollutants into the atmosphere. The difference is that these releases contain radioactive particles, called radionuclides, the most common being tritium oxide and tritium gas. Tritium, a radioactive form (or isotope) of hydrogen and a known cancer-causing agent, is produced as an unwanted by-product in nuclear reactors and released into the air, water, and soil.

Exposure to ionizing radiation is a public health issue that is controversial partly due to assumptions and factors utilized in calculating exposure doses as well as the accuracy of the available data. The nuclear industry and the Atomic Energy Control Board (AECB) claim that public health impacts of radioactive pollution are negligible. However, any and all exposure to ionizing radiation can contribute to an increased risk of health problems such as cancer and birth defects.

Ontario Hydro monitors radioactive emissions and radiation levels in the local environment around their nuclear stations. In the case of airborne tritium, air samples are collected monthly at several boundary locations of selected nuclear facilities in Ontario. Table 5 shows the 1996 average annual tritium concentrations in air at boundary locations for 3 facilities.<sup>54</sup>

Table 6: **Tritium concentrations in air (1996)**  
expressed in becquerels per cubic metre (Bq/m<sup>3</sup>)

Boundary Locations	Annual average	Highest average
Pickering	4.9	11.9 (North-East)
Darlington	0.5	0.8 (east)
Bruce	2.8	3.3 (east)

Note: The provincial average for this year is 0.05 Bq/m<sup>3</sup>.

As the table indicates, the Pickering Nuclear Station registered the highest average, well above the provincial average levels by a factor of 200. These levels were due to accidental and routine releases. While newer facilities (e.g., Darlington) may be better designed, resulting in lower tritium values, this should not detract from the overall issue of radioactive releases in any amount above background. These elevated levels could increase the risk of cancer and birth defects from contaminated drinking water, air, and food. Ontario Hydro has fought stricter tritium standards and has refused to use the best available technology to reduce emissions for cost reasons.

Jurisdiction over the nuclear industry in Canada resides primarily with the AECB, which is concerned with pollution that reaches the public and those workers at nuclear facilities. This leaves a void in regulation as far as controlling radioactive pollution in the environment. To date, other levels of government have avoided any involvement in radioactive pollution control.

One approach to deal with radioactive pollution is to adopt a strategy being championed by the International Joint Commission (IJC) that advocates the elimination of potentially harmful pollution at source, that is, zero discharge for persistent toxic substances.

#### **Recommendations:**

- \* Provincial and federal governments should incorporate those radionuclides that meet the definition of persistent toxic substances in their strategy for virtual elimination, in line with recommendations made by the IJC.<sup>55</sup>
- \* Ontario, in conjunction with the AECB and other levels of government, should implement mechanisms to measure and report on the environmental impacts of radioactive emissions on a routine basis.

## **GLOBAL ATMOSPHERIC CHANGE**

### **Ozone Depletion**<sup>56</sup>

The ozone layer in the upper atmosphere (stratospheric ozone) is the earth's protector against the sun's harmful UV radiation, acting as an invisible filter absorbing most of the UV-B rays. Reduction in the amount of stratospheric ozone inevitably leads to an increase in the intensity of UV-B radiation reaching the earth, inflicting damage to living organisms and materials as well as affecting air quality.

Over the past several years, stratospheric ozone has been diminishing, primarily due to the presence of substances such as chlorofluorocarbons (CFCs) in the atmosphere. CFCs and other such ozone-depleting substances are (or were) used in air conditioning, refrigeration, aerosols, extinguishers, as solvents and pesticides. These substances are very stable chemicals that do not break down in the lower atmosphere. When released, they drift into the stratosphere where they are broken down by ultraviolet radiation, releasing ozone-destroying chlorine and bromine atoms. Their long life spans, in some cases more than 100 years, allow them to continue their path of destruction well into the future.

In 1987, under the provisions of the Montreal Protocol, governments agreed to phase out CFCs; in 1995, production halted in developed countries.<sup>57</sup> However, other industrial chemicals that cause ozone depletion are in use, such as HCFCs (although they are slated



for elimination by 2020). Even if CFCs in the atmosphere are held at their present levels, ozone will continue to be depleted into the next century.

Methyl bromide is 50 times more powerful in destroying ozone than CFCs. It is effective in getting rid of food pests by attacking their central nervous system and leaves no residue on food. Scientists estimate that up to 10% of the destruction of the ozone layer is caused by methyl bromide. There are organic alternatives that could be used to control insect infestation. Canada and the US have agreed to ban methyl bromide effective in 2001, except for critical use and quarantine.<sup>58</sup>

The global ozone layer has been reduced by about 3% between 1979 and 1991, with depletion being much more dramatic at the north and south poles. In 1993, the ozone layer over the Antarctic was sometimes less than one-quarter of that measured in the early 1970s. Thinning of the ozone layer will likely continue to worsen until the early 21st century and complete recovery may take up to 100 years.<sup>59</sup>

While ozone in the stratosphere is essential to the health of the planet, ozone at ground level is the main component of smog and extremely harmful to health.

#### **Health Impact of UV-B radiation** <sup>60</sup>

- sunburn, photoaging of skin, rise in skin cancer (enhanced for those on photosensitive drugs);
- increased risk of cataracts; and
- suppression of the immune system: possibly affecting severity and/or speed of infection of viral diseases, parasitic diseases, and bacterial and fungal infections.

#### **Other Effects** <sup>61</sup>

**Terrestrial plants and aquatic ecosystems:** Increased UV-B may reduce crop yields and disrupt marine food chains. The early growth stages of plants are likely affected. On older trees, the growing tips are most seriously affected before the bark is formed. High UV-B levels have been found to cause damage in the early development of fish and sea animals.

**Air quality:** Higher levels of UV-B radiation penetrating the lower atmosphere cause an increase in the chemical reactivity of several gases found in ambient air. Pollutants from vehicle exhaust, gasoline vapours, and industrial emissions interact with UV-B radiation leading to an increase in the production of ground-level ozone.

**Materials:** Increased UV-B levels can cause discolouration and loss of strength in wood and plastic materials, resulting in use of special treatments and more frequent replacement.

## Recommendations

\* In keeping with the principles of the Montreal Protocol of 1987, the province should regulate and phase out the use of ozone-depleting substances (ODS) in Ontario and implement measures such as:

- ⇒ mandatory servicing of automobile air conditioners;
- ⇒ mandatory recycling and recovery programs of ozone depleting substances;
- ⇒ proper disposal of old appliances containing CFCs;
- ⇒ proper labeling of equipment and products containing ODS;
- ⇒ appropriate training for equipment service providers; and
- ⇒ phasing out all use of methyl bromide and supporting safe organic alternatives.

## Climate Change (The Greenhouse Effect) <sup>62</sup>

This has become the hot issue of 1997 to 1998, primarily due to publicity over the Kyoto Protocol. Climate change is a direct result of the increase of greenhouse gases in the atmosphere. "Greenhouse gases" such as carbon dioxide (CO<sub>2</sub>), methane, and nitrous oxide, are naturally occurring gases. They are transparent, allowing sunlight in but absorbing the infrared radiation from the earth's surface, acting like a thermal blanket around the earth. However, human activity is thickening the blanket to the point where CO<sub>2</sub>, the most abundant gas, is expected to double from pre-industrial levels over the course of a century, possibly raising global temperatures anywhere from 1° to 3.5° C.

Greenhouse gas emissions, primarily CO<sub>2</sub>, come largely from the burning of fossil fuels (coal, oil, gas and diesel), industrial emissions, as well as changes in land use (land clearance, cutting and burning forests). Industrial gases such as CFCs are strong infrared

**Kyoto Protocol:**<sup>63</sup> A world-wide agreement to cut greenhouse gases was negotiated in December 1997 in Kyoto, Japan. While Canada signed the agreement on April 29, 1998, this is not ratification of the Protocol. The agreement would result in industrialized countries cutting their total greenhouse gas emissions by 5.2% of 1990 levels by the year 2010. Canada has committed to a 6% reduction (the US to 7%). The Protocol also provides for a market mechanism whereby parties will be able to buy emission credits from other parties. Ottawa has no plans to ratify the Kyoto agreement unless it gets consensus from the provinces and territories. The western provinces, notably Alberta, are major obstacles in achieving agreement. On April 24, 1998, at a provincial/federal environment and energy meeting, Environment Minister, Christine Stewart said: "We will not do anything to jeopardize our economy." The basic strategy employed to date by the Canadian government is to continue discussions and encourage industries to adopt voluntary measures to reduce emissions.<sup>64</sup>

absorbers, and further elevate the greenhouse effect. In Canada, the transportation sector accounts for approximately 26% of greenhouse gas emissions.

Canada is the world's second highest greenhouse gas emitter on a per capita basis.

### **Health and Environmental Effects** <sup>65</sup>

The gradual rise in temperatures as a result of climate change could disrupt weather patterns, increase the severity and frequency of adverse weather effects, melt polar ice, raise sea levels to swamp islands and low-lying areas and cause droughts in other regions. The long-term implications of climate change could lead to a number of possible consequences:

- increased famine and malnutrition;
- increasing numbers of eco-refugees from floods and other disasters;
- heightened risk of occurrence of tropical diseases spread by mosquitoes and other insects migrating into more temperate regions; and
- changes to existing habitat, and loss of plant and animal species.

Ontario, the major consuming province, which result in an interest in low energy prices, has made no public statements in favour of tough action. Yet Ontario is likely to experience increases of 3°C to 8°C in the annual average temperature in the last half of the next century if climate change is not halted.<sup>66</sup> Ontario's lack of response to the challenges of climate change is telling.

### **Recommendations**

- #11: Ontario should implement a province-wide strategy to reduce greenhouse gases (GHG) beyond the reduction targets in the Kyoto agreement and support a national program with similar objectives. This strategy should include the following actions:
- a) establish mandatory GHG emission reduction targets and timelines on a local and regional basis;
  - b) support and promote research, through funding and other financial initiatives, activities that lead to increased energy efficiency, such as alternative fuel technologies, fuel-efficient vehicles, and retrofitting;
  - c) establish a provincial Ontario Atmospheric Fund (such as the Toronto Atmospheric Fund), that provides loans to projects that lead to reductions in GHG emissions and that can be adapted on a local or regional basis;<sup>67</sup>
  - d) implement a transportation strategy directed towards reduction in automobile use along with fiscal commitments to public transit and other such alternatives; and
  - e) develop a public education programme in cooperation with other levels of government, communities, and individuals and the general public that supports and addresses the role of communities and individuals to actions and initiatives

dealing with climate change.

## CURRENT PROGRAMMES AND POLICIES - HIGHLIGHTS

### Emissions Trading Programmes

Emissions trading is rapidly becoming the favoured pollution reduction strategy on a provincial, national and global scale. The theory behind this marketable rights scheme is that a maximum pollution level (a cap) can be established and regulation can be put in place to achieve this level. A fixed number of allowances or credits representing emission amounts are meted out to facilities based on estimated usage. If the facility emits less than its cap, a surplus of allowances or credits is created. These allowances or credits may be bought, traded, sold or banked for future use just like any market commodity.<sup>68</sup>

The advantages of emissions trading must be weighed against the issues it raises:

- Emissions trading is only one tool to achieve emission reduction targets and should not take precedence over other pollution prevention measures.

- Emissions trading may obscure the importance of setting declining caps on emissions. If parties to the trade reduce emissions below levels required (as in the Kyoto Protocol), the excess reduction can be transferred to another party, permitting the latter to achieve its targets without actually reducing its own emissions to the mandated level.<sup>70</sup>

#### **Trading Allowances for SO<sub>2</sub>, United States Acid Rain Program<sup>69</sup>**

SO<sub>2</sub> allowances are allocated to utility-generating units on the basis of historical fuel consumption and specific emission rates. If SO<sub>2</sub> emissions are reduced more than required, the excess allowances can be banked and called upon in the future if necessary. In 1995, unexpected low prices for low-sulphur coal stimulated fuel-switching, resulting in a reduction of SO<sub>2</sub> emissions by 3 million tonnes more than was required by the US acid rain programme. Some utilities are expected to draw on these banked SO<sub>2</sub> allowances after 2000. As a result, the reduction goals and timelines of the US acid rain programme may not be realized until 2010.

- The trading process could result in hotspots of environmental or health damage in sensitive areas and for vulnerable populations. It could further exacerbate inequities between developed and developing nations.
- The administration and cost of these programmes have not been adequately addressed.

Emissions trading may be one avenue to reduce pollution, but it is not a panacea. Its use may not even be appropriate at a time when provincial and federal governments have minimized regulation and enforcement.

**Recommendations:**

- \* Ontario should ensure that emissions trading does not create environmental hotspots and does not impede reduction in cap values or jeopardize emission reduction goals.
- \* Ontario Hydro should be required to reduce its annual NO<sub>x</sub> emissions limit by an additional 6,000 tonnes immediately.

**A Balancing Act - Ontario Hydro and the Hartford Steam Boiler Co.** <sup>71</sup>  
 As a result of closing a gas-fired cogeneration plant, this Hartford Connecticut power company opted to purchase electricity from other sources that were dirtier and likely to boost air pollution emissions. In order to comply with state environmental protection standards, the company needed to find parties from which they could purchase emission credits. One willing seller was Ontario Hydro, holding 6,000 tonnes in emission trading credits as a result of reductions in NO<sub>x</sub> emissions at two of its plants. The deal - 500 credits sold for \$500,000. And what benefits have been accrued to the environment?

**Cleaner Fuels**

**a) Sulphur Levels in Gasoline** <sup>72</sup>

Canadian gasoline has amongst the highest sulphur levels in the world varying anywhere from about 785 ppm to 10 ppm, with an average of 340 ppm. Ontario has the highest average sulphur level at 540 ppm. Sulphur in fuels

adversely affects emission control systems and is a barrier in the development of high efficiency engines. Reducing sulphur level in fuels would decrease emissions of other pollutants including particulate matter.

A recent study by Environment Canada on sulphur levels in fuels identified two possible options. Option A recommended reducing sulphur content in gasoline to an annual average of 30 ppm by the year 2002 with regional variations. Option B recommended a reduction to 150 ppm by the year 2003, with a provision to tie-in to US levels. (At present, there is no US standard, although California adopted the 30 ppm standard years ago.) Option A may cost refineries \$1.8 billion, possibly result in one to three closures, and cost consumers about one cent a litre at the pumps. However, its impact on air quality as well as health benefits would be significant. The following table projects these benefits for the year 2020 for seven major cities across Canada, including Toronto.

**Table 7: Avoided Health Effects and Cost Benefits, Option A (30 ppm) in year 2020** <sup>73</sup>

Avoided Effect	Estimated Cases Avoided	Estimated Cost Benefits <sup>(1)</sup> (\$ Thousands)
Premature mortality	82	329,000
Chronic respiratory disease	290	84,400
Hospital admissions	94	690
Emergency room visits	261	160

<b>Bronchitis in children</b>	3600	1,300
<b>Restricted Activity Days</b>	60,400	4,470
<b>Asthma Symptom Days</b>	127,500	6,240
<b>Acute respiratory symptoms</b>	435,600	6,100
<b>Total <sup>(1)</sup> (\$ Thousands)</b>		432,000

(1) based on economic estimates of societal values

After much delay, on October 23, 1998, the federal government announced that sulphur levels in gasoline would be reduced to 30 ppm by the year 2005, with an interim reduction target of 150 ppm in 2002.<sup>74</sup> The issue of sulphur levels in diesel fuel has been put on hold awaiting further studies on adverse health effects of diesel fuel consumption.<sup>75</sup>

#### **b) MMT: A Win for Ethyl Corporation - A Loss for Canadians <sup>76</sup>**

The import and interprovincial trade of MMT, a gasoline additive manufactured by Ethyl Corporation, a US company, was banned by Canada based on its likelihood to damage emissions control equipment in automobiles and its possible effects on health and environment. MMT contains manganese, a known toxic linked to neurological and motor disorders. The effects of prolonged low-level exposure are not known. The US EPA has refused to approve MMT for sale and MMT is banned in California. On July 20, 1998, in fear of losing a \$251 million dollar lawsuit filed by Ethyl Corporation under NAFTA provisions, Canada lifted its ban.

**c) Benzene**, a volatile and flammable liquid, is a known human carcinogen. Long-term exposure can cause various skin problems, bronchitis and pneumonia, and numerous other irritations. Most of the benzene emitted comes from transportation activities, with gas-powered vehicles emitting up to 80 times more benzene than diesels.<sup>77</sup>

#### **Recommendations:**

- \* In keeping with the need for cleaner fuels, Ontario should act without delay to:
  - a) legislate the sulphur level in gasoline to an annual average of 30 ppm as a maximum by the year 2002;
  - b) require all filling pumps in the province to post the sulphur content of gas;
  - c) adopt a mandatory standard for sulphur level in diesel fuel at 400 ppm (or 0.04%) to replace the current level of 500 ppm;
  - d) ban the use and sale of MMT; and
  - e) set limits on emission standards for benzene and aim for zero discharge.

#### **Inspection and Maintenance (I/M) Programmes**

Mandatory I/M programs are a cost effective way of reducing tail pipe emissions and are widely supported by car manufacturers and owners alike. The experience of existing I/M programs (e.g., in the Greater Vancouver Area) has borne this out. Not only do such

programmes result in fuel savings, they generate spin-off effects in jobs and investments.<sup>78</sup>

In August 1997, Ontario introduced its mandatory I/M emissions testing programme, namely Drive Clean, for trucks, buses, and cars. The programme projected reductions in emissions of NO<sub>x</sub> and VOCs of 15 kilotonnes and 47 kilotonnes respectively by the year 2005 (this represents a mere fraction of the total emissions of these pollutants, roughly 2% and 5%).<sup>79</sup> The Drive Clean programme was to begin in the Toronto area by 1998, but its implementation has been delayed by a year, with no explanation. What's more, the automobile repair shops that form the front line of the programme have been directed to use outdated equipment for testing emissions, namely two-speed idle technology that does not measure NO<sub>x</sub>, the key component of smog. While the testing and subsequent repairs can reduce emissions of other pollutants, the adjustments in the repairs are likely to cause increases in the emissions of nitrogen oxides.<sup>80</sup>

**Recommendation:**

- \* Ontario, through the Ministry of Environment, should implement the Drive Clean Mandatory I/M Program immediately in the major urban areas in Ontario and in the rest of the province by April 1999 and ensure that:
  - a) testing centres use the most up-to-date technology available that detects the major components of smog; and
  - b) the current emission reduction targets for NO<sub>x</sub> and VOCs are replaced with more rigorous targets and timelines in an overall shorter time period.

**Deregulation and Ontario Hydro**

Ontario Hydro has signed an option to purchase electricity from the largest single US utility source of sulphur dioxide emissions along the Eastern Canadian border. If this option is exercised, SO<sub>2</sub> emissions would rise significantly. In addition, the utility intends to bring back into service its mothballed oil-fueled and coal-power plants to replace lost power generation. Without appropriate protection in place, these actions, enabled by deregulation, will likely result in increased power production from low-cost, older coal-fired power plants that in turn emit significantly more pollutants than modern facilities.<sup>81</sup>

**Recommendation:**

- \* Ontario should not proceed with the introduction of competition in the electricity sector until measures are in place to ensure that emissions of smog and acid rain precursors will not increase as a result of this action.<sup>82</sup>

**Public Relations and Communications**

The complete absence of a public communication initiative to provide environmental information in an easy, readily accessible format sends a message in its own way. The

public has a right to full disclosure of the presence of toxic substances in products and of those facilities that use, manufacture, and/or release pollutants into the atmosphere.

**Recommendation:**

- \* The province should develop a communication strategy specifically geared to providing the public with necessary environmental information in an easily accessible format. Such information should include a list of those facilities that use, manufacture and release pollutants into the atmosphere.

**KEY FINDINGS AND RECOMMENDATIONS**

Throughout this paper, emphasis has been placed on the need for significant reductions in emissions in all sectors if any real improvements in air quality are to be realized. This requires appropriate legislation that implements pollution prevention policies at the source along with mandatory standards and targets. The government cannot rely on voluntary efforts in the absence of a regulatory framework.

While acknowledging that major changes take time, short-term strategies that are in step with a long-term vision could be initiated with relative ease. At the same time, the inevitable shifts in the nature of employment that such strategies may cause must be accommodated.

It is not acceptable to continue to tolerate situations that lead to marginalization of communities and individuals and that treat vulnerable populations as a norm. Nor is it acceptable to delay measures that prevent environmental degradation on the basis of the lack of full scientific evidence. A vibrant economy is viable only within the constraints of a healthy environment. Cleaner air, water, and land will inevitably lead to reduced health care costs, a healthier future for our children, and opportunities for innovation and job creation.

**Key Findings**

**1) Emissions:**

Motor vehicle emissions are the largest single source of smog in Southern Ontario. On a provincial and national level, the transportation sector contributes to more than 60% of the total amount of NO<sub>x</sub> emitted. To date, programmes to reduce NO<sub>x</sub> emissions have been ineffective.

**2) Health Effects:**

- Pollutants affect the respiratory, reproductive and cardiac systems, as well as organs such as liver, kidneys, and glandular systems. Several are mutagenic, carcinogenic and affect reproductive and nervous systems.
- Adverse health effects have the greatest impact on vulnerable populations.
- There are no apparent discernible threshold levels for tropospheric ozone or PM.



- The long term effects of chronic exposure are not well known.

### **3) Governance:**

Funding cuts have eroded inspection, monitoring and scientific research. Policies such as deregulation and harmonization have weakened control and enforcement of existing regulations. Emphasis on the voluntary approach is inappropriate in a regulatory vacuum.

### **4) Air Quality Standards and Objectives - Status:**

- The current one-hour national objective (or provincial criterion) for ozone does not fully protect health and environment nor is it mandatory.
- There are currently no guidelines or objective levels for particulate matter.
- There is no further action on recommendations made in the Acid Rain Strategy Report with respect to the reduction of SO<sub>2</sub> and NO<sub>x</sub> emissions.
- Critical loads for nitrate deposition have not yet been established.
- The lack of consistency and clarity in terminology related to standards is a barrier to public communication and comprehension of the issues in air pollution.

### **5) Monitoring, Science, and Research:**

- The decrease in monitoring and inspection programmes is not only detrimental to tracking air quality; it compromises the ability to properly address problem areas. As a result, many air issues such as acid rain are slipping through the cracks.
- Cuts in the funding to science and research are likely to affect the ability to set sound policy and improve monitoring, and open the door to further criticism by industry on the inadequacies of science to provide convincing evidence on cause and effect.

### **6) Collaborative Approaches:**

A large part of Ontario's air pollution problem comes from United States. Collaborative and concurrent actions are required to achieve the necessary large-scale reductions in NO<sub>x</sub>, VOCs, SO<sub>2</sub>, PM and greenhouse gases.

### **7) Process and Consultation:**

The representation and participation of non-governmental groups as stakeholders in government consultations is relatively small as compared to representatives from industry and government. The process and facilitation in these consultations are problematic; failure to reach consensus is a common outcome. In the past few years, the frequency and value of public and stakeholder consultation in Ontario has dwindled.

### **Key Recommendations:**

In order for Ontario to realize improvements in air quality, a regulatory framework within a legislative context is necessary. Many recommendations for provincial action have been included in this paper. Key recommendations for immediate implementation include:

- \* enact the appropriate legislation and measures to implement policies directed to

- pollution prevention strategies accompanied by mandatory targets and timelines;
- \* adopt the following standards and practices:
    - set the one-hour air quality objective for ozone at 50 ppb as a mandatory standard;
    - set objective levels (24-hr average) for PM<sub>10</sub> at 25 µg/m<sup>3</sup> and for PM<sub>2.5</sub> at 15 µg/m<sup>3</sup> ;
    - establish targets to reduce NO<sub>x</sub> emissions by 75% (of 1995 levels) by 2010;
    - accelerate emission reduction targets and timelines to areas identified as problematic;
    - place a cap on SO<sub>2</sub> emissions that ensures a 75% reduction of the current cap by 2015; and
    - reduce sulphur levels in gasoline to 30 ppm by 2002.
  - restore and enhance funding of monitoring and inspection programs and specifically;
    - ensure that there are sufficient monitoring stations for urban and rural sites;
    - investigate mechanisms that link monitoring and exposure to health endpoints;
    - increase ambient air monitoring of PM<sub>2.5</sub> as well as the use of personal exposure monitors to better characterize individual exposures to PM<sub>2.5</sub> ; and
    - issue air quality advisories indicating specific sources, locations and pollutants.
  - support and fund scientific and epidemiological research in the public sector to ensure objectivity, accessibility, and strong, defensible standards;
  - support and advocate joint programmes and collaborative action with other jurisdictions in Canada and the US in addressing transboundary issues, while at the same time not delaying action on the pretext of lack of action from others;
  - adopt a collaborative approach to decision-making and ensure that the public is given fair and equitable opportunity to participate in consultations; and
  - operate on the principle of full public disclosure of environmental information and publish such information in readily accessible easy format.

### **Recommended First Step**

In the short term, a strategy needs to focus on priorities and have the tools, policies, and action plan in place to enable its implementation. The strategy must inform and engage the public, and provide the motivation to achieve its goals and objectives.

Key Issue - Smog: This issue receives the greatest media coverage and public attention, particularly in urban areas, and is a key indicator of air quality.

#### Key Pollutants:

- PM<sub>2.5</sub>: PM is the penultimate link to the components in all the air issues; and
- NO<sub>x</sub>: This is the most common element found in all air pollution issues.

Key Sector - Transportation: The automobile is the key target. Programmes and plans are readily available that can decrease emissions, use cleaner fuels, and reduce car use.

#### Action Plan - Key Tools:

- 1) Cleaner fuels and emissions reduction
- 2) Reduction in automobile use; and
- 3) Sustainable transportation planning policies.

Implementation of Strategy:

To guide and implement the strategy, requires that a provincially funded body, such as a smog steering committee, be established. Representation on the committee should be gleaned from a wide spectrum of the population including non-government groups in environment, health and transportation, as well as representatives from government ministries, the Ontario Medical Association, Worker's Health and Safety Centres, labour, environmental groups, and industry. The committee would form working groups to address specific issues. In all cases, decisions would be reached in a collaborative manner by consensus.

The tasks and responsibilities of the committee and any of its working groups should include:

- developing specific goals and timelines and identifying priority areas;
- coordination of regional projects in the province;
- allocation of resources to designated projects;
- periodic, public reviews to evaluate progress and effectiveness;
- ongoing public education and communication programmes;
- monitoring government actions and performance;
- establishing a mechanism for collection of data and any other relevant information and ensure public accessibility; and
- exploring innovative methods in other jurisdictions that may be suitable in Ontario. Examples include the Clean Air Strategic Alliance in Alberta and the Air Care Program in British Columbia.

## GLOSSARY

**Acid aerosols:** Acidic particles dispersed in gases. The combination of sulphur dioxide gas, sulphuric acid, liquid and solid particles creates an acid aerosol.

**Acid deposition:** Refers to deposition of acidic pollutants on biota or land or in waters of the earth's surface.

**Acid Rain:** a phenomenon associated with the emission of acidic substances and subsequent deposition in the form of precipitation.

**Acute respiratory symptom days:** Days when symptoms such as chest discomfort, coughing, wheezing, etc. are experienced.

**Adverse effect:** Impairment of quality of environment, injury or harm to plant or animal life, effect on human health.

**Aerosol:** A stable mixture of small particles suspended in gas.

**Air Pollution Index:** The basis of an alert and control system to warn of deteriorating quality (In Ontario it is the 24-hour running averages of SO<sub>2</sub> and suspended particles).

**Air Quality Advisory (Ontario):** A forecast advising of impending poor air quality due to photochemical smog (ground level ozone).

**Air Quality Index:** A system that provides hourly indications of air quality in major cities in Ontario based on six pollutants: sulphur dioxide, nitrogen oxides, ozone, carbon monoxide, suspended particles, and total reduced sulphur compounds.

**Air Quality Objective (AQO):** The air quality management goal for the protection of the general public and the environment in Canada, based upon consideration of scientific, social, economic and technological factors.

**Ambient air:** The open air, external to buildings.

**Ambient Air Quality Criterion:** A criterion developed by the Ministry of Environment that specifies the desirable maximum ambient air concentration of a contaminant. For example, the one hour ambient air quality criterion for ground level ozone in Ontario is 80 parts per billion. (The difference between the Ontario criterion and the national objective of 82 ppb is simply due to unit conversion from 160 µg/m<sup>3</sup> to ppb and rounding.)

**Anthropogenic:** Referring to alterations made to the environment due to human activity.

**Asthma:** A lung disease characterized by an inflammation, causing airways to respond to a variety of triggers.

**Asthma Symptom Days:** Days when asthmatics experience an increase in asthma symptoms.

**Background radiation:** The amount of radioactivity in a location due to naturally occurring radiation from the earth and space.

**Becquerel (Bq):** The system international (SI) unit describing the rate of radioactive disintegration of an element. One becquerel of radioactivity is one disintegration (by radioactive decay) per second.

**Benzene:** A volatile organic compound present in vehicle exhaust. It is carcinogenic and causes other severe health effects.

**Bioaccumulation:** The process by which contaminants in the environment accumulate in living organisms either directly through consumption of a food source or indirectly

through the environment.

**Biogenic:** Referring to vegetative (natural) sources.

**Biota/biologic:** Relating to plants, animals and micro-organisms.

**Cap:** The maximum allowable level for emission of pollutants. The current cap for SO<sub>2</sub> emissions in Canada is 2.3 million tonnes.

**Carcinogenic:** An agent that incites the development of malignancy.

**Chronic bronchitis:** A chronic obstructive disease characterized by excess mucus production in the bronchial tree.

**Contaminant:** An unwanted and perhaps harmful physical, chemical or biological substance in the environment.

**Critical load:** A measure of how much pollution an ecosystem can tolerate before long term effects set in. Calculations of critical load are based on the ability of 95% of lakes in a region to maintain a pH of 6 or more. (In Ontario, critical loads for sulphate deposition can range from less than 8 kg/ha/year to greater than 20 kg/ha/year.)

**Emission:** Any pollutant that makes its way into the air.

**Epidemiology:** The study of distribution, determinants, and dynamics of health and disease.

**Exceedance:** Represents excess deposition above critical load.

**Exposure:** The result of being in contact with a contaminant in the environment.

**Ground-level ozone:** A colourless gas formed from chemical reactions between nitrogen oxide and hydrocarbons in air and the presence of sunlight.

**Health Effects Pyramid:** A pyramid that visualizes the relationship between the severity of health effects caused by exposure to a pollutant or class of pollutants:

**Inhalable particulate:** Particles with a diameter less than 10 microns.

**Ionizing Radiation:** Any high-energy atomic, subatomic particle or electromagnetic wave that in its passage through matter causes the ejection of electrons from atoms resulting in the formation of ions (positively or negatively charged atoms).

**Morbidity:** various health effects, other than mortality; for example, hospital admissions.

**Mortality:** Loss of life, death.

**Mutagenic:** Capable of altering genetic material.

**National Smog Management Plan:** A series of preventative initiatives developed by the Federal Government.

**Nitrogen Oxides (NO<sub>x</sub>):** Includes nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>).

**Ontario Smog Plan:** A plan developed by the government of Ontario to address the smog problem in Ontario.

**Ozone (O<sub>3</sub>):** A component of smog, ozone is a colourless gas formed from chemical reactions between nitrogen oxides and volatile organic compounds in the presence of sunlight in the lower atmosphere. Ozone also occurs naturally in the upper atmosphere, where it shields the earth from harmful rays.

**Ozone Episode Day:** A day on which widespread elevated levels of ozone occur.

**Particulate Matter (PM):** refers to any airborne solid or liquid material less than 100 microns in diameter. PM<sub>10</sub> refers to PM less than 10 microns, known as coarse particles.

PM<sub>2.5</sub> refers to fine or respirable particles less than 2.5 microns.

**Photochemical reaction:** A chemical reaction influenced or initiated by light, particularly ultraviolet light.

**Primary pollutant:** A contaminant directly emitted into the atmosphere.

**Radioactive:** Having the property of emitting ionizing radiation.

**Radioisotope:** A radioactive form of an element.

**Radioactive decay:** The process whereby a radioactive element emits ionizing radiation while undergoing change (i.e. decay).

**Reference Level (RL):** A level above which there are demonstrated effects on human health and/or the environment. It provides a scientific basis for establishing goals for air quality management and is defined for all receptors for which information is available.

**Secondary pollutant:** A contaminant formed by reaction with other pollutants in the atmosphere.

**Sievert (Sv):** The system international (SI) unit describing the relative biological impact of absorbed doses of different types of radiation on various body organs and tissues.

**Smog:** A harmful mixture of gaseous and inhalable pollutants. The term comes from the words "smoke" and "fog".

**Stratospheric ozone:** ozone in the atmosphere (10 to 40 kilometres above the earth's surface) formed by the conversion of oxygen molecules by solar radiation. Stratospheric ozone absorbs most of the UV radiation before it reaches the earth.

**Sulphur Dioxide (SO<sub>2</sub>):** A colourless gas with a strong odour, readily converted in the atmosphere to sulphuric acid and sulphate aerosols, a major concern of acid rain.

**Target load:** The amount of pollution deemed politically acceptable, taking into account factors such as ethics, scientific uncertainties, social, economic and environmental considerations. It is presently set at 20 kg/ha/year for wet sulphate deposition and arbitrarily at 10 kg/ha/year for wet nitrate deposition in Ontario.

**Total Suspended Particulate:** A generic term for airborne particles including smoke, fumes, dust, fly ash, pollen etc.

**Toxics:** a category of pollutants including VOCs, heavy metals, organic chemicals.

**Toxic pollutant:** A substance that can cause cancer, genetic mutations, organ damage, changes to the nervous system, or physiological harm from prolonged exposure, even to relatively small amounts.

**Tropospheric ozone:** See ground level ozone.

**Virtual Elimination:** A term used to imply zero discharge, not total elimination.

**Volatile Organic Compounds (VOCs):** Any organic compound that participates in atmospheric photochemical reactions.

## ACRONYMS, ABBREVIATIONS AND UNITS

AECB	Atomic Energy Control Board
AETG	Acidifying Emissions Task Group
AQO	Air Quality Objective
Bq/m <sup>3</sup>	Bequerels per cubic metre
CAA	Clean Air Act (U.S.)
CEC	Commission for Environmental Cooperation
CCME	Canadian Council of Ministers of the Environment
CEPA	Canadian Environmental Protection Act
CFCs	Chlorofluorocarbons
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CWS	Canada-Wide Standards
GHG	Greenhouse gas
HCFCs	Hydrochlorofluorocarbons
kg/ha/yr	kilograms per hectare per year
ktonnes	kilotonnes = 1000 tonnes = 1 million kilograms
I/M	Inspection and Maintenance
□□□	Methylcyclopentadienyl manganese tricarbonyl
µg/m <sup>3</sup>	Millionths of grams per cubic metre
µm	Micron, or one-millionth meter
MOE	Ministry of Environment (Ontario)
NAAQO	National Ambient Air Quality Objectives
NAICC	National Air Issues Coordinating Committee
O <sub>3</sub>	Ozone
ODS	Ozone-Depleting Substances
OMA	Ontario Medical Association
PM	Particulate Matter
PM <sub>2.5</sub>	Fine Particulate Matter
PM <sub>10</sub>	Coarse Particulate Matter
ppb	Parts per Billion
ppm	Parts per Million
POPs	Persistent Organic Pollutants
NO <sub>x</sub>	Nitrogen Oxides
SO <sub>2</sub>	Sulphur Dioxide
SOMA	Sulphur Oxide Management Area
TSP	Total Suspended Particulates
UN ECE	United Nations Economic Commission for Europe
VOC(s)	Volatile Organic Compounds
WGAQOG	Working Group on Air Quality Objectives and Guidelines





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**A SUSTAINABLE WATER STRATEGY FOR ONTARIO**

By Paul McCulloch and Paul Muldoon

Prepared for

The Environmental Agenda for Ontario Project

March 1999

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## SUMMARY

### **Current Status**

Water is essential to both our health and economic well-being, as well as the health of all non-human species with which we share this earth. Ontario is fortunate to have an abundant supply of freshwater. However, our technologically advanced and industrialized society is jeopardizing this seemingly inexhaustible resource. Ontario's waters, especially those found within the Great Lakes Basin, are contaminated with numerous toxic chemicals, placing the health of humans and other species at risk. Other naturally occurring substances are found at such high levels that they too impair water quality. Local water shortages require water to be piped or shipped over great distances, using valuable energy and expensive infrastructure in the process. Proposals have been put forward to divert massive quantities of water from Ontario to other thirsty jurisdictions with little or no regard to the potential negative long term impacts. This state of affairs is not sustainable. Eventually, the costs to future generations who will be saddled with contaminated and degraded waters will far outweigh the smaller cost of taking action now to utilize our water resources wisely.

### **Causes of the Problems**

Ontario's waters have historically been used on a first-come, first serve basis, resulting in numerous conflicts among its various uses. The ecosystem and life supporting functions of water have not been given any special consideration in resolving these conflicts and often come up on the short end of the stick. Although some measures have been taken over the past twenty years to manage water, they have generally been designed only to reduce or sometimes minimize the adverse impact upon water as opposed to providing full protection. There is no commitment to the principle that there must always be adequate quantities of clean water available to maintain its ecological functions. In the end, decisions are made by balancing the ecosystem function of water with other uses for the sake of economic and industrial concerns. The result of this ad-hoc approach to decision-making is a hodge-podge of policies and programmes aimed at alleviating specific problems as they arise instead of an integrated and comprehensive water policy that provides consistent guidance to all public decision-makers and stresses the protection of water. Furthermore, recent budget cuts and deregulatory measures have jeopardized the implementation of these programmes and policies.

### **Agenda for Change**

There needs to be a public commitment guaranteeing the ecosystem function of water. The commitment should start from the following principles:

- All life depends upon a reliable source of clean water to survive.
- There must be adequate quantities of water to support a variety of ecological and economic functions, the uppermost being the life supporting function of water.
- Ontario's water should be used wisely by giving priority to those uses that are considered more important and that are sustainable over a long period of time.

In determining which uses are considered more important over others, a hierarchy of uses should be set out as follows: preservation of ecosystem function, provision of potable water, provision

of water for irrigation, recreational, industrial and commercial uses on a proportional basis, and lastly, waste disposal. Activities on the lower end of the hierarchy would only be allowed if it were demonstrated that the higher priorities would not be jeopardized by that use. Decision making over activities should also incorporate the precautionary principle, that, where an activity or substance poses a threat of harm to the environment, we should err on the side of caution; precautionary measures should be taken even in the face of scientific uncertainty.

Some will argue that the protection of water will place our economic prosperity in jeopardy. However, these arguments fail to consider the costs that society will bear if we do not take action now: the human tragedy associated with adverse health impacts and the loss of life, the irrevocable loss of other species, the much larger cost of remediating impaired water resources in the future, and the cost of health care and wildlife management programmes. Moreover, these economic doomsday arguments fail to consider that there are innovative and cost effective approaches to protecting our water resources. Pollution prevention measures, which use processes, practices, materials, products, or energy to minimize or avoid the generation and use of pollutants and wastes altogether, are effective in reducing pollution and may result in cost savings as well.

### **Key Recommendations**

- Ontario should develop a comprehensive water policy that is applied consistently to all decisions regarding water and that firmly commits to ensuring that adequate quantities of clean water are available to support a variety of ecological and economic functions, the uppermost being the life supporting function of water.
- A *Pollution Prevention Planning Act* should be enacted that requires all companies that discharge wastes into water to report annually on their use, production, release, disposal and transfer of toxic substances and to develop and implement a plan for reducing and eliminating their use of toxic substances. Certain substances should be identified for bans and phase outs, which should be incorporated into regulatory measures to provide for zero discharge of these toxics.
- A *Safe Drinking Water Act* should be enacted that guarantees the citizens of Ontario the right to clean water.
- A groundwater management strategy is needed that identifies important aquifers, groundwater recharge zones, and areas that are sensitive to groundwater pollution and protects these critical areas under the *Planning Act*.
- A conservation strategy needs to be implemented with measures that address education, building code standards, retrofitting of new homes, industrial and agricultural use of water, and water metering and pricing.
- Water transfers between different watersheds and different jurisdictions should be banned outright.

Authors:

Paul Muldoon is the Executive Director of the Canadian Environmental Law Association (CELA), a public interest group whose mandate is to use and improve laws to protect the environment. He also teaches environmental law and policy at the University of Toronto and York University. Paul Muldoon has written extensively on water issues and has been a member of the MISA advisory board and the Science Advisory Board of the International Joint Commission. Paul McCulloch was the 1997-98 articling student at CELA. He recently graduated from York University with a combined law and Masters in Environmental Studies degree.

Acknowledgements:

The authors would like to thank the following people for their comments on a draft copy of this paper: Ziggy Kleinau, Margaret Casey, Elizabeth Wharton, Mike Brouse, Mark Winfield, Al Marshall, Alan Bangay, Ray Metcalfe, Bob Gibson, Sarah Miller and Kathleen Cooper. The comments of Mr. Gibson, Ms. Cooper and Ms. Miller were particularly extensive and most welcome. The views expressed remain the responsibility of the authors.

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## A SUSTAINABLE WATER STRATEGY FOR ONTARIO

### OVERVIEW OF WATER ISSUES IN ONTARIO

#### **The Importance of Water**

Water is fundamental to our planet. It plays an intrinsic role in sustaining life as all plants and animals must consume water to survive. Terrestrial species, including humans, specifically depend upon freshwater to sustain themselves. Water also provides habitat, not only for water dwelling species, but also by shaping and reshaping the physical world. The cycling of water between groundwater, surface water, and the atmosphere drives our climate and maintains a hospitable living environment. In addition to these critical ecosystem or ecological functions, water plays an important role in our society, supporting many social and economic activities. Thus, water, and particularly freshwater, is essential to both our health and our well-being, as well as that of all non-human species with which we share this earth.

Ontario is endowed with an abundant supply of freshwater. There are over 225,000 lakes, an uncounted number of rivers and streams, and plentiful groundwater aquifers, all located within the province's boundaries. Furthermore, Ontario borders upon four of the five Great Lakes, which together contain over 20 percent of the world's surface freshwater supply.<sup>1</sup> In comparison to other places where water is scarce, Ontario is truly blessed to have such an enormous quantity. Nevertheless, this vast supply of water is not without limits. Only one percent of the water contained in the Great Lakes is replenished each year.<sup>2</sup> Much of Ontario's water is a legacy from the great glaciers that once covered this land. Once lost or degraded, it will take many generations to replace.

Yet, our technologically advanced and industrialized society continues to place greater and greater demands on our sources of freshwater. We use water for drinking, bathing, and washing; utilize water in many industrial processes; control and redirect water in order to irrigate agricultural operations; harness water to generate energy; engineer waterways for navigation; play in and on water as part of our leisure activities; and use water bodies as a depository for waste. It is an unfortunate reality that these various needs compete for existing supplies of water, both among themselves and with water's ecosystem functions. These competing uses have the potential to upset the delicate balance that nature has developed over time to ensure that water continues to maintain life.

We can ill afford to upset this delicate balance; to do so jeopardizes our own society, the lives of other species, and our ecosystem as a whole. Water must be used carefully and its ecosystem functions preserved if it is to continue to sustain the lives of future generations and non-human species. The purpose of this paper is to explore and propose policies that, if implemented, would ensure that water will always be available in adequate quantities and quality. It starts with a few basic assumptions:

- All life depends upon a reliable source of clean water to survive;

- Water must be available in adequate quantities to support a variety of ecological, economic and social functions, the uppermost being the support of all forms of life; and
- Ontario's water should be used wisely. In evaluating whether a use is wise or not, one should consider:
  - (a) the importance of that use in relation to other uses
  - (b) whether a use of water is sustainable over a long period of time.

These simple and uncontroversial assumptions provide the building blocks for developing a sustainable water policy for Ontario.

### **The Nature of the Problem**

Unfortunately, there is ample evidence to demonstrate that the waters of Ontario are not being used wisely; they cannot be characterized as clean, are not always available in adequate quantities, and may be used by anyone without regard to whether that use is the best and most important use. This is especially true for the waters of the Great Lakes Basin. Over eight million people live in this region and rely upon these waters for drinking and other functions. Furthermore, ecosystems within the Great Lakes Basin are under severe stress. The health of these waters will have a significant impact upon the health of people and other species. While other waters within Ontario do not face the same pressures as those within the Great Lakes Basin, they too face certain problems, especially at a local level.

#### **(a) Clean Water**

Clean water is pristine. It contains no substances other than those that existed at low levels before humanity imposed its industrial society upon the planet. Many foreign and toxic chemicals can now be found in the waters of the Great Lakes Basin, including organo-chlorides, pesticides, PCBs, dioxins, lead, mercury, and radionuclides. The potential health effects of long-term exposure to these chemicals by all species are not fully understood and Ontario continues to act as an immense laboratory until more is known. In the meantime, plants, animals and citizens who live in and drink from the Great Lakes Basin remain at risk. Some organic and inert substances also contaminate our water supplies. Although naturally occurring, they are now found at such high levels that they impair the life supporting function of water. The presence of these chemicals and other substances in our water is unacceptable. Although there has been a decrease in emissions of certain toxic chemicals since the 1970s, we still have a long way to go to restore Ontario's water quality to a pristine state.

#### **(b) Adequate Quantities of Water**

The people of Ontario have the dubious distinction of being one of the most intensive users of water in the world. Although Ontario may never drain all its vast water resources, there are still significant dangers. Local shortages have occurred, especially in areas that rely upon groundwater. Water takings may have long term negative impacts on local ecosystems, even if the taking is relatively small in comparison to the body of water from which it is being withdrawn. Water shortages have resulted in water being shipped or piped over great distances, using valuable energy and resources in the process. Perhaps more significantly, there have been numerous proposals to transfer large quantities of Ontario's water to other thirsty jurisdictions. Most proposals involve massive diversion projects either by canal or long range transport.<sup>3</sup>



These proposals provide a further potential threat to Ontario's water supply in that, once initiated, they may be difficult to halt, and that the quantities of water involved may have a significant impact upon water supplies.

**(c) Wise Uses of Water**

Ontario's water tends to be allocated on a first-come, first-serve basis. Requests to utilize water are analyzed individually, rarely in relation to that of other users. There is no societal statement as to what uses of water are to be given priority in Ontario. More importantly, it is not publicly recognized that the ecosystem function of water must be given precedence over other uses. Problems thus occur because the cumulative impact of various water uses are not considered, leading to competition for the same water supplies. Such a manner of allocating uses of water cannot be characterized as wise.

**(d) The Need for Action**

It is apparent that Ontario's seemingly inexhaustible supply of water faces many risks. This is true in terms of both water quality and water quantity. Furthermore, the costs of inaction are staggering. The dollar cost of cleaning up impaired or degraded water sources typically involves large sums of money. Government scientists from the Canada Centre for Inland Waters estimated that it would cost \$6 billion dollars over thirty years and \$19 billion over the next one hundred years to contain, maintain, monitor and clean up four of the largest leaking dumps on the American side of the Niagara River<sup>4</sup>. This estimate only entails the cleanup of four specific sites. The cost of remediating all degraded sites within the Great Lakes Basin would be enormous. It is far more cost effective to invest in pollution prevention measures than to remediate a problem after the fact. It is even more mind numbing to contemplate the human health and wildlife impacts of not taking action now to avoid further degradation of our water resources. Pollution results in increased spending on health care, over and above the human tragedy associated with adverse health impacts and even the loss of life. Similarly, Ontario has already seen the loss of some species in the Great Lakes Basin due to pollution and loss of habitat. Once lost, these species will never return. It is impossible to put a price tag on these impacts.

In all likelihood, the risks will only increase given the enormous changes that our planet is facing. Climate change, population growth, and further industrialization will add to the stress being placed upon Ontario's water resources. The need for effective water policies to address these problems has never been greater.

Before outlining a set of policies and recommendations designed to achieve this goal, it is important to set the context in which they operate. The next section considers the political and regulatory framework that currently governs decision-making over water. In some instances, this context serves to limit what action may be taken in the short-term to address water problems in Ontario.

**The Context for Water Protection in Ontario**

**(a) Jurisdiction**

The provincial government has the primary mandate to deal with water issues. During the 1970s and 80s, Ontario developed and introduced a broad array of water management initiatives. However, these initiatives were often fragmented and uncoordinated and remain so to this day.

Various ministries within the provincial government have authority over different areas of water management, including the Ministry of the Environment, the Ministry of Natural Resources, the Ministry of Agriculture, Food, and Rural Affairs, and other provincial bodies such as conservation authorities and the Clean Water Agency. Moreover, within a single ministry, there may be different departments managing different aspects of water. No single policy or government body oversees and coordinates water management in Ontario.

Furthermore, it is not entirely within Ontario's jurisdiction to take action with respect to all water contained within its boundaries. Federal, provincial, and municipal governments all have jurisdiction over certain aspects of water management.<sup>5</sup> The federal and provincial governments have also both entered into inter-provincial and international agreements regarding the management of water. This combined jurisdiction over water leads, in some instances, to duplication of some activities and, more importantly, gaps in responsibility. Water also does not respect political boundaries. Water flows from one jurisdiction to another through rivers and streams and is similarly transported great distances by weather activities. Therefore, Ontario may need to persuade other jurisdictions, especially American States that lie to the south and west of the Great Lakes, to take actions that will benefit the quality of our water.

The recommendations outlined below recognize the fragmented state of water management in Ontario. As the provincial government has the broadest jurisdiction over water, most recommendations are directed to this level of government. Ontario certainly has the capacity to deal with the fragmentation between its own ministries. It is also expected that the provincial government will take the lead in resolving interjurisdictional issues. To the extent that other jurisdictions have responsibility for water, the range of actions that may be taken by Ontario alone may be limited. Nevertheless, political pressure has resulted in joint concrete actions being taken in the past. Moreover, Ontario will be more successful in persuading other jurisdictions to take action once it has implemented effective measures of its own.

#### **(b) Current Political Trends**

Another set of key issues that affect water management is the changing political climate, both domestically and globally. There has been a strong movement towards less government involvement in public matters and resort to the free market to govern affairs. Four trends in particular can be observed in Ontario:

(a) **Deregulation:** Since 1995, the government has weakened regulatory standards, reduced reporting requirements, and removed public accountability of government action in an effort to streamline decision-making and reduce red tape. Changes to the *Environmental Protection Act*, the *Ontario Water Resources Act*, the *Mining Act*, the *Public Lands Act*, the *Planning Act*, the *Conservation Authorities Act*, or their regulations have essentially lessened regulatory oversight of water management, giving the public less say in how water will be utilized and making it easier for individuals and companies to exploit our water resources for economic gain.

(b) **Government Downsizing:** The provincial government has been dramatically cutting provincial spending, with some of the biggest reductions being directed towards the Ministry of the Environment and the Ministry of Natural Resources. The government has reduced its environmental protection budget by some 40%. The federal government has cut Environment Canada's budget by 30%. These cuts affect virtually every aspect of

water management, leaving less resources and personnel for monitoring, inspecting, standard setting and enforcement of environmental laws.<sup>6</sup>

(c) Downloading: Another trend has been to assign many of the responsibilities that were formerly the domain of an upper level of government to a lower level of government, from the federal government and the provinces to regional and municipal levels of government. However, the lower levels of government rarely have the resources or institutional capacity to deal with these new responsibilities. The result has been that many government services are not being delivered as effectively as before. In other instances, lower levels of government have sought assistance from the private sector to meet their obligations, insulating these activities from public oversight.

(d) Liberalized Trade: The fourth trend is the increasing globalization of world economies during the 1990s through liberalized trade, as evidenced by the passage of the North America Free Trade Agreement, the Uruguay Round of the General Agreement on Tariffs and Trade, and the negotiations over the Multilateral Agreement on Investment. These agreements may pose significant constraints on the ability of the provincial government to implement legislation that protects water if that legislation also inhibits trade.

It is apparent that the "three Ds" and liberalized trade have significant repercussions for water management in Ontario. While the authors strongly oppose these measures, some attempt has been made to recognize the current state of affairs in the recommendations that follow. For instance, cost effective and cost recovery measures have been suggested where possible. Flexible regulatory measures that enable industry to meet obligations in a cost effective and accountable manner are recommended and encouraged. However, in other instances, some of the changes that have been introduced are simply incompatible with an effective water management regime. Most definitively, there must be a strong regulatory base to ensure minimum standards for water in the province, and adequate personnel and resources to implement, monitor and enforce these policies. Some of the recommendations clearly resist the changes that have occurred and demand that these trends be reversed.

### **(c) The Limits of Science**

The state of science and technology poses another set of issues for water management. There is a great deal of uncertainty in determining the impact that human activities have on water and its ability to provide its life-giving functions. We cannot state with certainty what health impacts certain substances contained in our waters have on humans and other species. Similarly, the relationship between changes to water quantity and ecosystem health is not fully understood. This presents a quandary in that we often need to make decisions based on less than full information.

The position taken in this paper is that we should err on the side of caution at all times. Where an activity or substance poses a threat of harm to the environment, precautionary measures should be taken even in the face of scientific uncertainty. This precept is referred to as the precautionary principle.<sup>7</sup> The precautionary principle entails that a party proposing an activity that may cause harm to the environment bears the onus of establishing that the activity would have no net negative impacts, as opposed to having the government or citizens prove that it is harmful. This determination would include an analysis of the effects of the activity on sensitive

populations in society, not just the healthy adult male. Thus, emission standards should be set well below the threshold level for negative impacts to ensure there is no adverse effect on human health and that ecosystems and non-human species are not threatened. Water takings should only occur when it can be demonstrated that there will be more than enough water left to support the surrounding ecosystem. In some instances, the application of the precautionary principle demands that certain activities not occur whatsoever.

### **The Need For A Sustainable Water Policy in Ontario**

Given the perils facing Ontario's water resources, it is obvious that further action is needed. The primary need is a clear public commitment to ensuring that Ontario has an adequate supply of clean water available to support all life in the province. Decisions regarding other uses of water must be made in accordance with a hierarchy of uses if it can be demonstrated that the proposed use will not interfere with this critical ecosystem function. There is also a need to address the fragmented manner in which Ontario manages its water resources. An effective water management regime must be coordinated among the provincial government's own ministries and with other jurisdictions. Each jurisdiction should attempt to achieve the same goals and apply the same policies in making decisions over water. Therefore, there needs to be one overarching and comprehensive water policy in Ontario that each jurisdiction can use to guide their respective actions.

### **Recommendations: A Sustainable Water Policy for Ontario**

- Ontario should develop a comprehensive water policy that provides a framework that is applied consistently to all decisions regarding water under its mandate and in coordination with other jurisdictions. The policy must:
  - (a) make a clear public commitment to the principle that there must always be adequate quantities of clean water to support a variety of uses in the province, the uppermost being the ecological function of water;
  - (b) establish a hierarchy of uses of water to ensure that the most important uses are given priority over less important uses. The order of uses should be as follows: preservation of ecosystem function, provision of potable water, provision of water for irrigation, recreational, industrial and commercial uses on a proportional basis, and lastly, waste disposal;
  - (c) incorporate the precautionary principle as a basis for decision-making and place the onus on the party proposing to use water to demonstrate that there will be no negative impacts on the ecological function of water from that use; and
  - (d) develop a means of coordinating water management initiatives and decision-making among provincial bodies and with other jurisdictions.
- The policy should be supported by the following government initiatives that must be maintained on an ongoing basis:

- (a) development of an ecosystem approach to water management by identifying links between water quality and quantity with land use patterns and economic activity, links between transboundary and domestic air pollution and water quality, and considering synergistic and cumulative impacts of water uses;
- (b) maintainance of a monitoring network governing both water use and water quality with the information being publicly accessible;
- (c) promotion of research into water quality and quantity issues, including new innovative solutions, whether they be technological, demand management or public education;
- (d) publication of annual reports that outline progress in implementing the policy and those reports should assessed by an arm's length agency such as the Ontario Auditor or the Environmental Commissioner of Ontario; and
- (e) provision of adequate funding and resources to carry out these and existing programmes effectively.

## WATER QUALITY

### Overview

#### (a) Water Quality and Health

Far from the romantic image of Ontario being filled with pristine lakes and rivers, many of our water sources, especially those within the Great Lakes Basin, are contaminated. In 1995, 7,365 tonnes of pollutants were discharged into Ontario's waterways, as reported from site-specific sources.<sup>8</sup> Further discharges go unreported, including contaminated runoff from agricultural operations and urban centres, spills from industrial facilities, and seepage from the over one million septic tanks located throughout the province.<sup>9</sup> The evidence of these discharges is borne out by the fact that over 360 chemicals have been detected in the Great Lakes.<sup>10</sup> Similarly, 37% of drinking water wells surveyed in Ontario contained at least one contaminant in excess of drinking water quality objectives.<sup>11</sup> It is clear that this state of affairs does not afford all citizens of Ontario and other species access to clean water. It should be the goal of our water management regime to ensure that toxic chemicals are not discharged into Ontario's waterways and other substances that pose potential dangers are controlled in an appropriate manner.

The most obvious and direct impact of poor water quality is on the health of people, animals and the ecosystem. Toxic chemicals that are resistant to degradation accumulate in the tissue of animals and humans. Persistent toxic chemicals have been linked to various cancers, neurological disorders, genetic mutations, behavioural disorders, and growth

Contamination in Ontario Fish		
Lake	Main % of Contaminants	advisories
Superior	PCBs, Toxaphene, Mercury, Dioxins	38%
Huron	PCBs, Toxaphene, Mercury, Dioxins	24%
Erie	PCBs, Mercury	19%
Ontario	PCBs, Mercury Mirex, Dioxins	45%

*Source: Ontario, Guide to Eating Ontario Sport Fish: 1997-98 (Toronto: Queen's Printer, 1997)*

retardation.<sup>12</sup> Another recent and major concern is the presence of endocrine disrupters in our water, chemicals that have been shown to mimic the action of estrogen and disrupt tissue and organ development and growth.<sup>13</sup> The potential impacts upon sensitive human populations, such as children, the elderly, aboriginal peoples and pregnant woman, are of particular concern.

The adverse health impacts upon wildlife is also clearly documented. The effects of endocrine disruptors includes: decreased fertility in birds, fish, shellfish and mammals; decreased hatching success in fish, birds and reptiles; demasculinization of fish, birds, reptiles and mammals; and alteration of immune function in birds and mammals.<sup>14</sup> Similarly, toxic chemicals have been shown to cause deformities in reproducing birds and tumours in fish which is believed to have contributed to the collapse of the Great Lakes Lake Trout fishery. Fish in some Ontario waters remain unfit to eat. Consumption advisories continue to escalate due to contaminants in fish, including mercury, PCBs, Mirex, Toxaphene, and Dioxins.<sup>15</sup>

### **(b) The Regulation of Water Quality**

The laws, regulations, policies and guidelines currently governing water quality in the province are a complex affair. There are four different regimes or frameworks depending on the source of pollution and, more specifically, how or where the pollution is being discharged. The first regime governs direct discharges to Ontario's waterways, i.e., those polluters that emit substances into permanent bodies of water such as lakes, rivers, or streams. There is another regime pertaining to indirect discharges into sewers and sewage treatment plants. Groundwater protection again encompasses a totally separate regime. Finally, there are guidelines dealing with drinking water. Over and above this regulatory regime, the Province has initiated a pollution prevention programme. This initiative is not considered a regulatory measure because it relies entirely on voluntary participation by industry and business.

The fact that there are so many regimes support the need for a coordinated sustainable water strategy as outlined in our first recommendation. However, it is recognized that this will not occur overnight. Therefore, specific recommendations follow with respect to each regime, keeping in mind the long-term goal to move towards a more comprehensive and coordinated regime. As discussed in the next section, it is further recommended that this comprehensive regime include pollution prevention as its primary focus and incorporate pollution prevention into regulatory measures. In addition to the laws, regulations and guidelines governing the above noted areas, there is a body of intergovernmental agreements that impose obligations on the province, only some of which are legally binding, to deal with certain water quality issues. These agreements are more fully discussed later in this paper.

### **Pollution Prevention**

There are various means available to regulators to protect Ontario's waters and ensure they are kept clean. Historically, regulators have relied upon direct regulation of discharges. This type of pollution abatement, known as the "Command and Control" approach,<sup>16</sup> typically involves imposing discharge limits on polluters. This type of regulation is rather limiting for the following reasons:<sup>17</sup>

- Limits are usually stated on a per unit basis (e.g., x tonnes per thousands of litres of water). Therefore, although the amount of pollution per unit of water discharged is regulated, the *total* amount of pollution discharged is not. Reductions in total discharges are not required.
- Discharge limits incorporate dilution. Thus, the greater the volume of water being discharged, the greater the total amount of pollutants that may be discharged.
- This type of control focuses on end use solutions, those that address pollutants after they have been produced but before they are released into the environment. It fails to recognize that pollution can best be controlled by never creating the substances in the first place.
- The restrictions only apply to discharges to water. Polluters may be able to escape the restrictions by shifting their discharges to other media such as air or groundwater by disposing of waste through incinerators or landfills.
- Finally, pollution abatement is only functional in addressing discharges from fixed identifiable locations, known as point sources. It is next to impossible to regulate discharges from non-point sources such as runoff.

It has been clearly recognized that pollution prevention is a more effective means of reducing pollution.<sup>18</sup> Pollution prevention involves the use of processes, practices, materials, products, or energy that avoid or minimize the generation and use of pollutants and waste. It includes techniques such as material substitutions, process modifications, use of closed loop processes, good operating practices to minimize unwanted discharges, and end-product redesign. Pollution prevention is almost always more desirable than abatement in that it avoids the pitfalls described above. In some instances, it may even result in cost savings for industry and consumers as more efficient processes are discovered.

There are certain toxic substances that simply cannot be allowed to enter the environment at all. Examples include PCBs, dioxins, certain organo-chlorines, and radionuclides. The only effective strategy for such substances is zero discharge.<sup>19</sup> Abatement and dilution are not acceptable means of dealing with such substances. An even more attractive option is to ban the use of these substances altogether, either immediately or over a phased in period of time. This is sometimes referred to as sunsetting.<sup>20</sup> In 1993, the provincial government took the initial steps to sunsetting some toxic chemicals in releasing the *Candidate Substances for Bans, Phase-Outs, and Reductions*.<sup>21</sup> The purpose of this list was to further pollution prevention goals and further commitments in the *Great Lakes Water Quality Agreement* by identifying the inherently toxic substances and identifying opportunities to ban or phase-out the substances. Unfortunately, there has been no report on progress with respect to these commitments.

#### **Why The Need for Zero Discharge?**

- One drop of oil can render up to 25 litres of water unfit for drinking
- One gram of 2,4-D, a common herbicide, can contaminate ten million litres of drinking water
- One gram of PCBs can make up to one billion litres of water unsuitable for freshwater aquatic life
- One gram of lead in 20, 000 litres of water makes it unfit for drinking
- One gram of lead makes one thousand litres of water harmful to drink

*Source: Environment Canada, Fact Sheet: Clean Water - a Priceless Asset*

In the early 1990s, the provincial government initiated some pollution prevention programmes. These programmes included:

- P4 Pollution Prevention Pledge Program: This programme includes pledges by specific sectors to reduce the emissions by some stated amount. Various incentives are given to industry such as awards and other forms of recognition.
- Pollution Prevention Memorandums of Understanding (MOU): These agreements between government and manufacturing associations set out plans and courses of action designed to reduce pollution at member facilities.<sup>22</sup>

Another programme, Recognizing and Encouraging Voluntary Action (REVA), is now being developed. However, this programme has not been finalized or had the benefit of public consultation with non-governmental groups.

These initiatives are not comprehensive in that they each address only selected facilities within certain industrial or municipal sectors. The present government has done nothing to expand these programmes to other sectors. More importantly, it is apparent from these initiatives that the provincial government intends to rely entirely on the voluntary approach to pollution prevention. The concerns with relying strictly upon voluntary initiatives can be summarized as follows:<sup>23</sup>

- Lack of Public Participation in the Negotiation of Voluntary Programmes: With few exceptions, most voluntary programmes are undertaken outside of the public spotlight. With respect to MOUs, virtually all of them were negotiated without the benefit of public input.
- Voluntary Agreements Pre-empt Regulatory Actions: While most voluntary agreements state that governments can still take regulatory actions, the practical effect of such agreements is that governments are unwilling to regulate on any matter related to the subject matter covered in the agreement. Hence, voluntary agreements may actually replace regulatory activity with a loss of the benefits that normally arise from having a regulatory framework in place.
- Voluntary Agreements Do Not Further the Principle of Accountability: It is apparent that voluntary agreements do not promote accountability since they are not subject to public verification and there are no penalties for those industries that fail to comply with the voluntary agreement. Thus, voluntary initiatives often have the problem of free riders, that is, some industries share the success of the good performers without doing any of the work.

Thus, while voluntary programmes may in some specific instances be useful in promoting action beyond a regulatory baseline, a comprehensive and enforceable regulatory system would achieve far greater results.<sup>24</sup>

#### THE ADVANTAGES OF POLLUTION PREVENTION

Pollution prevention not only reduces the quantity of pollution entering the environment; it may also result in economic savings. For example:

- Torcad Ltd. saved \$30,000 a year in material costs by recycling cleaning solutions in addition to reducing the discharge of the alkaline cleaner. The payback time for the investment is one and a half years.
- A project at Ford resulted in annual reductions of 1.8 tonnes of heavy metals, 55 tonnes of solvents, 227 tonnes of paint sludge, and 90,000 tonnes of water. Ford saved \$275,000 in costs at the same time.

Source: Ontario's Progress in Pollution Prevention, MoE (1997)



## **Recommendations: Pollution Prevention**

- The province should enact a *Pollution Prevention Planning Act* that requires all companies that discharge wastes into water to report annually on their use, production, release, disposal and transfer of toxic substances. Companies should then be required to develop and implement a plan for reducing and eliminating their use of toxic substances.
- The province should commit to the goal of zero discharge for toxic substances. The process of identifying candidate substances for bans and phase-outs should be accelerated. Once the substances have been identified, regulatory measures should be taken to ensure that these substances are eliminated in a timely fashion. Transition plans should also be developed where the ban or phase-out of the substances will result in inequities for workers or communities.
- Voluntary measures should only be used in conjunction with, not in place of, a strong and comprehensive regulatory base. Voluntary measures, which are developed under public scrutiny and contain a means of holding participants accountable for failing to meet their objectives, may be useful in achieving results over and above minimum standards in some instances.

## **Direct Discharges to Ontario's Surface Waters**

### **(a) Overview**

Direct dischargers are those facilities that discharge contaminants directly into a receiving waterway (as opposed to discharging to a sewer or into the ground). There are approximately 600 to 800 large facilities that can be characterized as direct dischargers in Ontario. Direct discharges are governed by the *Ontario Water Resources Act* (OWRA) and the provincial *Environmental Protection Act* (EPA). Each contains a general prohibition against the discharge into water of polluting materials that "may impair the quality of water" or "cause an adverse effect."<sup>25</sup>

However, there are exceptions to these general prohibitions, the most important being that one may obtain a license known as a Certificate of Approval (CofA). A CofA is obtained from the Ministry of the Environment and basically constitutes a license to pollute as it enables the license holder to discharge substances in accordance with the terms of the CofA. The content of the certificate is negotiated on a case-by-case basis between the applicant and a ministry official. The approvals branch of the MOE relies upon a number of documents in deciding whether to issue the permit and in developing its terms and conditions, including the Provincial Water Quality Objectives and the effluent limits emanating from the Municipal-Industrial Strategy for Abatement.

### **(b) Provincial Water Quality Objectives**

The Provincial Water Quality Objectives (PWQOs)<sup>26</sup> set out objectives for water quality in the form of concentration limits for a list of pollutants that are being discharged from industrial and sewage treatment facilities. For example, the limit for cyanide is 0.005 mg/L of water. The range of pollutants includes conventional pollutants, oil and grease, toxics (like phenols) and heavy metals (like chromium). The limits are based on a range of toxicity tests based on a few

specific aquatic species, to the extent that information is available. It is clear that the limits are not based upon thorough scientific analysis. As noted in the PWQO document, "ideally, water quality objectives should be established based on 'no negative effect' derived from chronic long-term tests on sensitive organisms. However, current understanding of chemical dynamics and effects on aquatic life are limited to a few species and contaminant levels that are lethal in short term tests."<sup>27</sup>

PWQOs are not legally binding standards. Only once they are incorporated into a CofA do they become so. Furthermore, the PWQOs do not take into account additive or synergistic effects of pollutants.<sup>28</sup> Although individually one substance may not cause an adverse impact upon the environment in low concentrations, when added to other discharges or mixed together with other substances being discharged, there may well be a detrimental effect on the environment. The PWQOs are further weakened by the use of the mixing zone, an imaginary line around the area where the effluent is discharged. The place where the concentration is measured to determine whether the effluent meets the PWQO is at the edge of the mixing zone, not where the pollutants are immediately discharged. Mixing zones allow for dilution of the effluent without reducing the total level of emissions.

PWQOs are not set in a manner that ensures that there are no potential impacts on human or ecosystem health. Nor do they take a precautionary approach that would require adopting stringent standards to allow for the uncertainty inherent in the system. They are really just a best guess based on a limited range of knowledge. The PWQO's must be revamped to ensure that Ontario's water will be truly clean for generations to come.

### **Recommendations: Provincial Water Quality Objectives**

- The Provincial Water Quality Objectives (PWQOs) should be converted into legally binding standards. Such standards should be enforceable in and of themselves, but should also be incorporated into certificates of approvals for water discharges.
- Each PWQO standard should be reviewed every five years to ensure that each standard is stringent enough to keep Ontario's waters clean. The reviews should be based on a sound scientific assessment that includes peer review, reflects the precautionary principle, and takes into account:
  - (a) both the lethal and chronic impacts on human health;
  - (b) the impact of substances on sensitive populations, such as children, aboriginal peoples, pregnant women, and the elderly;
  - (c) any potential adverse effects on the environment; and
  - (d) the synergistic, additive and cumulative effects.

### **(c) Municipal-Industrial Strategy for Abatement (MISA)**

In 1986, the provincial government launched a new water quality program called the "Municipal-Industrial Strategy for Abatement" (MISA). The original goal was the "virtual elimination of persistent toxic pollution from our waterways."<sup>29</sup> MISA was implemented in distinct stages, the

last of which has only recently been completed. The program began with monitoring of all facilities within nine industrial sectors (organic chemicals, inorganic chemicals, iron and steel, electrical power generation, petroleum, metal mining, industrial minerals, sewage treatment, and pulp and paper). Once the monitoring phase was completed, effluent limits were developed for each of these sectors based upon expected discharges per a specified unit of production. The effluent limits assumed that every discharger was using the "best available control technology economically achievable" (BATEA). However, it remained up to each discharger to determine how they would comply with the effluent limits. The effluent limits became legally binding when a regulation for each of the nine industrial sectors was passed and promulgated in 1994 and 1995. These limits were also incorporated into the certificates of approval for those facilities.

While the goals of the MISA program are laudable, there are numerous problems with its design. These include:

- the fact that the limits are production based; the more the facility produces, the more it is allowed to pollute. There is no absolute cap on discharges;
- MISA still relies upon abatement measures; it does not further the goal of pollution prevention;
- MISA will not achieve its virtual elimination goal as the regulations still allow large quantities of pollutants to be discharged. There has been no indications that there will a next round for MISA that would take into account newer and cleaner technologies and processes that would result in more stringent MISA effluent limits; and
- The relationship between MISA and the PWQOs remains unclear; there are now two regimes for regulating water quality in Ontario.

MISA has been weakened by recent amendments introduced by the present provincial government.<sup>30</sup> These amendments include:

- reducing the frequency of chronic toxicity testing from semi-annually to annually (after three years of monitoring to ascertain the safety of the effluent);
- removing effluent limits and annual monitoring for substances that are not used, produced or stored on site;
- reducing daily monitoring requirements for some parameters if a site's performance surpasses permitted limits for 12 consecutive months; and

#### **FAILING TO ACHIEVE ZERO DISCHARGE**

The MISA pulp and paper regulations included regulation 760/93, which originally required kraft mills to reduce emissions of AOx (total adsorbable organic halides) to 0.8 kilograms per tonne of pulp by 1999 and submit reports on how they would reduce emissions to zero by 2002. AOx is an indicator of the chlorinated compounds discharged into the environment, which are a well-known threat to the Great Lakes and human health.

Recently, the government has delayed the implementation of the zero discharge component, waiting for research being conducted at the University of Toronto on pulp and paper effluent, despite the fact that there is more than enough evidence of the adverse impacts of chlorinated compounds. The removal of the requirement to develop AOx elimination plans is thus contemptible. The plan would have achieved zero discharge of AOx, keeping some of the worst toxic chemicals from Ontario's waterways.

- removing the need to reduce AOX emissions to zero by the year 2002.

These changes undermine the basis for the testing regime, which was to determine whether the effluent in question, although not acutely toxic, remains at a level that still may cause harm over a longer period of time. Furthermore, it is assumed that there is little or no variation in the level of discharges. This may not be true where dischargers use a variety of chemicals in their processes or where temperatures vary widely. Therefore, these proposals run contrary to the need to gather further information regarding the chronic effects of pollution and the need to encourage pollution prevention.

### **Recommendations: Municipal-Industrial Strategy for Abatement**

- MISA should be amended as follows:
  - (a) add a requirement that each standard be reviewed every five years to ensure that the benefits of new technologies are translated into more stringent standards;
  - (b) impose loading caps that establish absolute discharge limits on facilities;
  - (c) require annual reporting on the extent to which MISA has achieved its goals and provide public access to reporting data; and
  - (d) reverse the recent amendments that reduced reporting requirements and commit to reduce AOX emissions to zero by the year 2002.
- Over the long-term, MISA and the PWQOs should be amalgamated into one comprehensive set of legally binding baseline emissions standards based upon the best available control technology. These standards should apply to all dischargers. These standards should be viewed as minimum baseline standards only and should not in any way inhibit the pollution prevention measures set out in an earlier recommendation.

### **Indirect Discharges to Sewers/Municipal Infrastructure**

There are over 12,000 facilities in Ontario that discharge their wastes into municipal sewer systems. This poses a serious problem as these discharges are not regulated. It has been suggested that 383,000 tonnes of hazardous waste were disposed of in this manner in 1991.<sup>31</sup> A study of the composition of the waste stream entering Metro Toronto's sewer system found copper, zinc, toluene, xylene, chromium, and mercury.<sup>32</sup> Yet, sewage treatment plants are generally only designed to deal with organic wastes. The overall result is that many toxic chemicals being discharged into sewer systems end up in receiving waterways or waste residues, which are spread out over the land.<sup>33</sup>

Generally, municipal councils are empowered to enact bylaws to control or prohibit industrial wastewater discharges into their sewer systems, although a municipality may not use this power to override applicable provincial legislation. In order to facilitate greater uniformity of municipal by-laws, the MOE has circulated a model by-law. The initial model sewer use by-law was

released in 1976. An updated version was released in 1988 as part of MISA.<sup>34</sup> It was anticipated that municipalities across the province would pass a by-law that incorporated the main elements of the model by-law, with variations as required to suit local needs. However, not all municipalities have done so. Others have incorporated only certain elements of the by-law suggesting that there is little uniformity across the province in terms of regulating discharge levels. For example, rather than requiring reductions in the total loadings, many of the by-laws simply required dilution of toxics.

There is plenty of room to place greater restrictions on municipal discharges. The MISA programme originally contained a proposal to develop pre-treatment standards based on BATEA for 22 industrial sectors that release wastes into municipal sewers. These pre-treatment standards placed limits on what facilities can discharge to sewers. These proposals have never been implemented, although similar regulations exist throughout the United States.

Enforcement of by-laws has always been a problem. Many municipalities simply do not have the resources or expertise to enforce the sewer by-law. Moreover, some municipalities allow for "sewer surcharges" whereby a municipality enters into an agreement with a facility or industrial sector that allows discharges over and above the levels specified in the sewer use by-law in return for the payment of a fee intended to cover the costs of treating the pollutants at the sewage treatment plants. It is unclear whether the funds are in fact used for this purpose. The MOE proposed to prosecute municipalities who are unwilling to enforce the legal requirements regarding the discharge of industrial wastes into sewers. This component of MISA has not been implemented, mostly due to vigorous opposition by municipalities.

### **Recommendations: Discharges to Sewers**

- The province should immediately develop a set of pre-treatment standards for discharges to sewers with a view to having the standards in place by 2002. The standards should be legally binding and include both conventional and toxic pollutants.
- The province should take a more active role in persuading municipalities to pass and enforce the model by-law, with financial incentives for those municipalities that do so or penalties for those that fail to do so.

### **Discharges to Ontario's Groundwater**

#### **(a) Overview**

In Ontario, approximately 23 per cent of the population relies on groundwater for drinking water. For some 90 per cent of the province's rural population, groundwater is the only source of water.<sup>35</sup> In the early 1990s, it was found that over one-third of the wells in rural Ontario had concentrations of pollutants over the provincial drinking water objectives.<sup>36</sup> Groundwater quality can be threatened by numerous sources, including landfill sites, the disposal of sewer and agricultural sludge, septic tank systems, mine tailings, and the application of pesticides to both urban and agricultural lands. Water quality is also compromised when natural recharge areas such as wetlands or aquifers are destroyed or impaired.

The regulatory and policy framework governing groundwater is far less advanced than that for surface water. Although groundwater faces many of the same problems as surface water, there are fewer laws, policies and programmes to protect its quality and quantity, and fewer remedies for people deprived of its use.<sup>37</sup> The Ministry of the Environment has the primary responsibility for the protection of Ontario's groundwater resources. The Ministry's groundwater strategy is expressed in the *Water Management* document, which states that the goal is to "protect the quality of groundwater for the greatest number of beneficial uses."<sup>38</sup> However, this policy is based on a first-come first-serve basis. There is only a general reference to the need to protect the ecosystem functions of groundwater and there is no guidance provided as to which use has priority over the other in the event of a conflict.

Moreover, the *Water Management* document is only applicable to the Ministry of the Environment. Other ministries make decisions and issue approvals involving activities that have the potential to impact groundwater. For example, the Ministry of Municipal Affairs has jurisdiction over septic tanks and land use approvals, the Ministry of Transportation controls the spread of road salt and dust suppressants, the Ministry of Consumer and Commercial Relations regulates fuel storage and underground storage tanks, and the Ministry of Natural Resources is responsible for evaluating wetlands. It is apparent that coordinated action will be necessary to effectively protect groundwater. In each of her three annual reports, the Environmental Commissioner of Ontario has recommended that a comprehensive, multi-ministry strategy be developed.<sup>39</sup> The Ministry of the Environment indicated in its 1996 business plan that it intends to take the lead in developing this strategy, but has yet to produce even a draft document or discussion paper.

Ontario has no specific legislation that is designed to protect wetlands or to protect significant groundwater recharge areas. There is a policy contained within the Provincial Policy Statement passed under the *Planning Act* that provides some protection to groundwater. However, this policy is limited in application to land use matters and is not legally binding. Municipalities must only "have regard" to the statement, not "be consistent with" it as was once required.<sup>40</sup>

### **Recommendations: Comprehensive Ground Water Management Regime**

- As part of the Sustainable Water Policy outlined in our first recommendation, the Ministry of the Environment should renew its efforts to develop an integrated and comprehensive groundwater management regime that will be applied in a consistent manner by all ministries, government agencies, and municipalities. The strategy should clearly restrict other activities unless it can be demonstrated that they will not adversely impact groundwater.

The town of Elmira understood the importance of groundwater when it was discovered that two of the town's wells were contaminated with a chemical known as NDMA in 1989. U.S. EPA studies indicated that NDMA was a potential carcinogen. The source of the contamination was a Uniroyal chemical production plant. Local citizens were forced to become deeply involved in scrutinizing the control of further discharges and the long-term remediation plan for this aquifer. This process took a heavy toll on the citizens as the process took over six years and involved three hearings before the Environmental Appeal Board.

Elmira now pipes its drinking water in from a neighbouring municipality, because the aquifer under Elmira is so badly contaminated.

- The Ministry of Environment should undertake a long-term monitoring project and develop an inventory of groundwater resources. The project should include information regarding water-well records, details of complaints, inspections and enforcement, and information about contamination and remediation, all of which should be publicly accessible.
- Important aquifers, groundwater recharge zones, and areas that are sensitive to groundwater pollution should be identified. These designated areas should be protected and land uses that can take place in those areas be legally restricted under the *Planning Act*.

### **(b) Septic Systems**

A potentially serious source of groundwater contamination is septic systems. The exact number of approved septic systems across Ontario is not known, although it is estimated that there are probably over one million septic systems in the province.<sup>41</sup> Some 22,000 new systems are approved each year.<sup>42</sup> In cottage country, as high as one-third of all septic systems are designed below standards, and one-third may be classified as a public health nuisance, although the corresponding numbers for the province in general are lower than this.<sup>43</sup>

All septic systems have a limited life span and need to be replaced at some point in time. They must also be installed correctly and continually maintained. If there is a failure to follow correct procedures at any point, septic systems can have serious environmental and human health impacts. Humans and other species can be exposed to bacteria and viruses. Septic systems, even if properly functioning, may not be able to treat nitrates, phosphorus and toxic materials that are often dumped into the system from household uses of substances such as cleaners, degreasers, paint, and chemicals.<sup>44</sup>

Historically, septic systems were governed under the *Environmental Protection Act*. However, in the spring of 1998, the province transferred the regulation of most septic systems to the *Building Code Act*. The Ministry of Municipal Affairs and Housing is now responsible for administering the septic system regime. The ministry has in turn delegated responsibility for approving new permits and enforcing the regulations to the municipalities in an attempt to integrate the septic and land use planning regimes. The septic approval now occurs at a very late stage, often after other approvals such as zoning changes have already been obtained. There may be pressure to grant septic approvals given the amount of time and money applicants have already put into a proposed development. There is also a concern that municipal building code inspectors may not have the expertise to evaluate applications properly. A similar concern arises with approval appeals, which have been transferred from the Environmental Appeal Board to the Building Code Commission.

The Commission on Planning and Development Reform in Ontario<sup>45</sup> outlined a number of important suggestions with respect to the use and management of septic systems. Some of these include:

- educational programmes for owners of existing systems about the proper use and maintenance of the systems;
- regular inspections and pump-out of systems paid for via a user fee basis;
- mandatory inspections when houses are sold; and
- time-limited permits based on the life expectancy of the system.

These suggestions were not adopted when the management over septic systems was transferred from the Ministry of the Environment to the Ministry of Municipal Affairs and Housing.

### **Recommendations: Septic Systems**

- The recommendations of the Commission on Planning and Development Reform concerning inspection requirements for existing septic systems, the need for septage disposal facilities and educational programmes for owners of septic systems should be implemented.
- A requirement should be made that septic system approvals be obtained in advance of planning approvals for developments via rezoning, severance, building permits or other approvals where a septic system will be required.
- Training and education should be provided to the Building Code Commission and inspectors to ensure they have the necessary expertise to evaluate the public health and environmental implications of both routine and innovative septic systems.

### **(c) Other Sources of Groundwater Contamination**

In addition to discharges from septic systems, there are numerous other sources of groundwater contamination that are very difficult to regulate. There are as many as 34,000 underground storage tanks containing gasoline, oil, aviation fuel, and a variety of other substances. One study suggests that 10% of these may be leaking.<sup>46</sup> These tanks are only dealt with as they are discovered.

Road salt poses another potential cause for concern. Although the Ministry of Transportation is trying to develop alternatives to road salt, salt continues to be spread onto Ontario's highways, where it then spreads into neighbouring waterways and fields. A similar problem occurs in the summer months when rural municipalities spread dust suppressants on gravel roads. Salt brine, calcium chloride and a number of recycled industrial by-products are used for this purpose. Most dust suppressants are classified as products as opposed to waste and therefore are not regulated under the *Environmental Protection Act*. Nor are they tested by the Ministry of the Environment or the Ministry of Transportation to determine their toxicity.

Pesticides from agricultural operations and both public and private lawn spraying pose yet another threat to groundwater quality. The federal

#### **DUST SUPPRESSANT THREATENS WATERWAYS**

Over 90 townships have spread Dombind®, a waste product from Domtar's Trenton pulp and paper mill, over rural roads to act as a dust suppressant. Dombind may contain a variety of contaminants, including dioxins and furans, phenols, sodium, and low levels of metals. Once spread onto roads, Dombind is highly water soluble and these contaminants find their way into roadside ditches, wetlands and waterways. Yet, the MoE has permitted the use of Dombind over the past five years through a Memorandum of Understanding negotiated with Domtar without public scrutiny. In early 1999, after intense public pressure, including a letter signed by three former Ministers of the Environment, did MOE agree to restrict the use of Dombind. Even then, there will be a two-year phase out period..

*Source: World Wildlife Fund - Action Alert: What is that Smelly Black Stuff on the Road?*



government regulates which pesticides may be lawfully used in Canada on the basis of whether the pesticide poses an unacceptable risk. This threshold does not comply with the precautionary principle. Ontario's *Pesticides Act* only governs the manner in which pesticides are applied. It does not restrict the total amount of pesticides that may be sprayed. Therefore, there are no regulations directed at curtailing the cumulative effect of pesticide use.

Another source of groundwater contamination is landfill sites. There are an estimated 1400 active and 2,500 closed landfill sites throughout Ontario.<sup>47</sup> While active sites are regulated by certificates of approval, a closed site may often no longer have an active owner. Yet, these sites may continue to leach contaminants into the groundwater. There is no policy on who is responsible for these sites. Recent changes to the *Environmental Assessment Act* and the *Environmental Protection Act* no longer require that a hearing be held to determine whether a landfill site should be approved. This removes the opportunity for the public to scrutinize proposals to ensure that the leachate will be treated effectively.

### **Recommendations: Groundwater Contamination**

- A study of sources of groundwater contamination should be conducted to determine the extent to which these sources, including their cumulative impacts, pose a threat to Ontario's water resources.
- The use and application of dust suppressants, road salt, and pesticides must be regulated. There should be programmes that encourage alternatives to these substances.
- A fund should be created to pay for the remediation of abandoned contaminated sites and underground storage tanks. The fund should be financed by means of a user fee on new related activities.
- The government should pass legally binding standards regulating leachate from landfill sites and governing the maintenance of storage tanks.

### **Protecting Ontario's Drinking Water**

All people require clean water to survive. The vast majority of Ontarians have little direct control over the water we drink; we simply turn on the tap. Although some can afford to purchase bottled water, tap water is still often used for cooking and bathing. It is clear that we rely heavily on tap water and depend upon public authorities to ensure that the water is clean and potable. All citizens of Ontario, no matter how rich or poor, should be able to trust that their tap water is safe to drink and should not feel the need to buy bottled water.

The primary legal control over the quality of drinking water is a policy entitled the "Ontario Drinking Water Objectives" (ODWO).<sup>48</sup> The ODWOs set out three types of objectives: maximum acceptable concentrations, interim maximum acceptable concentrations, and maximum desirable concentrations. Maximum acceptable concentrations set limits on the concentration of substances that are known to have human health effects or cause other serious problems with the taste or appearance of water. Interim maximum acceptable concentrations are

limits set for substances for which, although they may be known to cause chronic effects in mammals, there is insufficient information to establish the impact on humans. Maximum desirable concentrations pertain to substances that only affect the aesthetics of water. Like the PWQOs, the ODWOs are not legally binding. Instead, the drinking water objectives guide the MOE in issuing approvals to sewage treatment plants or industrial facilities. Hence, despite the fact that the *Ontario Water Resources Act* gives the Minister of the Environment the power to pass legally binding standards, they are only enforceable to the extent that they are incorporated into approvals.

The ODWOs do not include objectives for all substances that may be found in drinking water. For example, there is no standard for cryptosporidium, a protozoan parasite found in surface water. Many water treatment facilities are not able to treat this contaminant. In other instances, standards may be set too high based upon independent studies of the potential health impacts. For example, the current standard for tritium is 7000 bq/l, more than 700 times higher than that recommended by an independent advisory committee.<sup>49</sup> Standards for drinking water must be set in an objective and transparent fashion. Although it would be misleading to state that Ontario's drinking water is unacceptable, governments must be aggressive in protecting this resource and in keeping current with the science, especially as new evidence regarding long term and cumulative impacts arises.

#### ODWO'S UNDER SCRUTINY

Trihalomethanes are the by-products of the chlorination process in the treatment of drinking water. They are also a potential carcinogen. The Ontario standard for trihalomethanes is set at 350 mg/L, far less stringent than the U.S. standard of 100 mg/L and there is considerable pressure to make the U.S. number even more stringent. The difference can be attributed to differing rationales governing the risk assessment process. The precautionary principle suggests that the lowest standard should prevail until the potential effects are fully known.

Water is an absolute requirement for all people in Ontario. The Ontario public should have a guaranteed right to safe drinking water backed by enforceable standards. If governments are slow in restricting the continued discharge of toxics to the province's sources of drinking water, the public must be given means of protecting their own health. This right needs to be enshrined in legislation.<sup>50</sup>

The need for a guaranteed right to safe drinking water may become even more important in the near future as the ownership and operation of water and sewage treatment plants may be privatized and run by for-profit business.<sup>51</sup> This removes drinking water from the public sphere. If it were found that water was unsafe to drink, the public's only recourse may be through enforcing its contractual rights. There may be no political avenue open to take immediate and required action. If drinking water were to be privatized, there is also a need to ensure that it is priced appropriately to guarantee fair access for all economic groups in society.

#### **Recommendation: A Safe Drinking Water Act**

- The province should enact a *Safe Drinking Water Act*. Essential features of the Act would include the following components:

- (a) mandatory regulations specifying maximum levels of substances in drinking water that protect human health and provide clean and odour free water;
- (b) required monitoring and notification of any violations or any failure to perform any required duties;
- (c) required research into methods of treating drinking water that would reduce or eliminate the presence of organic chemicals from the finished water and the establishment of a drinking water advisory council;
- (d) the ability for citizens to bring a court action for violation of the statute and a judicial review application where the government has failed to perform a duty; and
- (e) the act would apply to both public and private water systems.

## WATER QUANTITY

### Overview

Ontarians are among the most wasteful users of water in the world. The average citizen uses more than 300 litres per day, more than any country other than the U.S.<sup>52</sup> In addition to withdrawals from major bodies of water, it is estimated that there are over 500,000 wells in Ontario drawing water, with 14,000 new wells being added each year.<sup>53</sup> One reason for our extravagant use of water is that it is cheap. Typically, Canadians are charged \$0.36 per 1000 litres of water. In comparison, Australians are charged \$1.47 per 1000 litres of water.<sup>54</sup> As a result, we use freshwater lavishly, do not recirculate water effectively, and do not invest significantly in developing efficient municipal water and treatment technologies.<sup>55</sup> Furthermore, water has become a commodity to trade and sell like any other good. Bottled water, drawn mainly from groundwater aquifers throughout the province, is now a major industry in Ontario, and much of this product is exported abroad.<sup>56</sup>

While Ontario is by no means in danger of exhausting its immense water supplies, there are still good reasons to practice water conservation. First, water quantity is inextricably linked to water quality. The more water used, the more that becomes degraded or contaminated. Second, water must be transported. Whether it is piped or trucked, the transport of water requires energy and substantial investment in infrastructure. The more water used, the greater the cost of energy and of building and maintaining this infrastructure. It has been estimated that Ontario's municipalities have invested over \$50 billion in water and sewage treatment infrastructure, and spend \$1.7 billion in annual maintenance costs.<sup>57</sup> Third, local water shortages do occur, especially in areas that rely on groundwater. Local water shortages often have severe impacts on local ecosystems that also rely on water to sustain its life cycles. Local water shortages increase the demand to ship water greater and greater distances, even across entire watersheds. These proposals involve great amounts of money to build and maintain. Moreover, the long-term impacts on ecosystems of large-scale water diversions are not understood. For these reasons, water conservation is an important component of an environmentally sustainable way of life.

In early 1992, the Ministry of Natural Resources launched a "Water Efficiency Strategy for Ontario."<sup>58</sup> The strategy was laudable. It promoted the principle that the users of water resources should pay the full cost for the water and wastewater treatment. It also provided for educating the consumer on water conservation matters. Despite the fact that the strategy underwent extensive consultation during its development, the strategy has not been implemented. The province does not have an operative programme to promote and achieve water conservation.

### **Recommendation: An Effective Conservation Strategy**

- The province should continue its efforts to further develop an effective conservation strategy and ensure that it is implemented by the year 2002. This conservation strategy must be an integral part of the sustainable water policy in our first recommendation and at a minimum should include the following:
  - (a) comprehensive educational programmes for industry and the public on water conservation;
  - (b) amendments to the building code and other such acts to ensure that new homes and industrial facilities are fitted with water efficient appliances and processes;
  - (c) mandatory water conservation programmes pertaining to retrofitting homes and industrial processes;
  - (d) prohibition on the funding of water or sewer expansion projects unless municipalities can demonstrate that they have undertaken water conservation measures;
  - (e) the development of specific programmes to reduce agricultural use of water; and
  - (f) review of the pricing of water to ensure consumers understand the cost of water.

### **Surface Waters**

Ontario's surface waters face water quantity issues despite the immense number of lakes, rivers, and streams present in the province. Human activity has altered the landscape to such a degree that water no longer flows in natural watercourses in some places. The result of these changes include disruption of plant and animal habitat and species loss, flooding in spring and during storms, drought in the summer, erosion, and well water loss. Furthermore, the loss of natural water flows is inextricably linked to water quality. Urban runoff and channel diversions result in water being dumped more quickly into receiving waterways without the benefit of percolating underground and through wetlands to filter out sediment and contaminants.

In the early 1990's, the government of Ontario invested significant time and resources into developing the concept of watershed management.<sup>59</sup> Watershed management entails developing plans on a watershed basis that provide for the management of water and land-water interactions. It identifies the form and function of natural systems, land uses, natural features, surface and groundwater systems, and linkages between these features within the watershed. Areas in need of protection, rehabilitation or enhancement are set out, and means of controlling land-water interactions identified.

Since 1995, the government has abandoned efforts to further watershed management. Most notably, conservation authorities, whose mandates are set on a watershed basis, have had their powers severely curtailed. Conservation authorities are now limited to implementing flood control and erosion measures. Additionally, they have had their budgets cut by 70% since 1995. The MNR and MOE have similarly incurred significant budget cuts and relegated watershed management to the backseat.<sup>60</sup>

### **Recommendation: Watershed Planning**

- The province should renew efforts to develop watershed planning as a decision-making tool. Conservation authorities should be provided with the mandate and the necessary resources to implement watershed planning.

### **Groundwater Depletion**

The water that exists under the surface of the land – groundwater - is invisible and unknown. The role groundwater plays must not be overlooked. In addition to supplying drinking water to many Ontarians, groundwater often forms the headwaters of important cold water creeks. It also supports wetlands and bogs and the variety of life that depends on this type of habitat. Some regions of Ontario suffer from widespread groundwater shortages.<sup>61</sup> Other areas may experience shortages only on a very localized basis. Nevertheless, these local shortages may still pose significant threats to the ecosystems that depend upon groundwater for survival.

The primary regulatory vehicle to protect groundwater is the water-taking permit issued under section 34 of the *Ontario Water Resources Act*. A permit is required for any activity that withdraws more than 50,000 litres of water in a day from the ground or from surface water. However, water takings for domestic uses, for farm purposes other than irrigation of crops for sale, or for fighting fires do not require permits.

#### **THE OAK RIDGES MORRAINE**

The Oak Ridges Moraine is a 160 km ridge of sand, silt and gravel that stretches across the northern reaches of the Greater Toronto Area. The moraine is an important groundwater recharge area, supporting a number of deep aquifers that feed springs and coldwater streams that flow through the GTA into Lake Ontario and supply drinking water to numerous towns and hamlets. Since 1990, the province has indicated a provincial interest in the moraine and issued interim guidelines regarding development within its boundaries. However, the guidelines are not legally binding and do not apply to all development activities. The Province has not acted upon the recommendations of a 1994 report to provide permanent protection to the Moraine. In the meantime, development continues to encroach upon the Moraine, jeopardizing its ecosystem functions.

Ontario's "Water Management" document<sup>62</sup> does not provide an extensive policy framework for water taking permits. One of the key elements of the policy is that if a water taking permit interferes with other water supplies that were in use prior to the issuance of the permit, the permittee shall restore the affected supplies or reduce the taking so as to eliminate the interference. There is only passing reference to the need to ensure that the ecosystem functions

of groundwater are maintained, and no requirement to consider the cumulative impacts on a particular aquifer.

In practice, water-taking permits are routinely issued with almost no opportunity for the public to scrutinize these decisions. There is seldom serious consideration of the implications of issuing such permits either individually or their cumulative effect. Moreover, there is little effort to keep track of the number and location of all of the permits. Essentially, permits are free for the asking. There is no guarantee that the ecosystem functions of water will be sustained under this system. Nor is there any reason to believe that water is being used for its best use.

### **Recommendation: Groundwater Management Strategy**

- A comprehensive groundwater strategy should seek to protect and conserve groundwater resources. Significant aquifers and groundwater recharge areas should be identified and land use practices that may occur in or adjacent to these areas should be restricted under the *Planning Act*.
- Water taking permits should be issued on the basis of a hierarchy of uses as follows: preservation of ecosystem function, provision of potable water, and provision of water for irrigation, recreational, industrial and commercial uses on a proportional as opposed to a first come, first serve basis.

## **INTERGOVERNMENTAL ISSUES**

### **Water Quality Agreements**

#### **(a) Great Lakes Water Quality Agreement**

In 1972, the Canadian federal government concluded an agreement with the United States called the *Great Lakes Water Quality Agreement* (GLWQA). This important agreement initially focused on phosphorous pollution in the Great Lakes. In 1978, the agreement was broadened to deal with toxic substances and other matters. It was then re-negotiated in 1987 with a number of important annexes being added to it. A key to the Agreement's success is its clearly stated commitment to eliminating the release of toxic chemicals. This commitment has resulted in the implementation of zero discharge goals and the reduction in the generation of contaminants, particularly persistent toxic substances. Jurisdictions have commonly interpreted the Agreement to require pollution prevention, as opposed to pollution control, when implementing regulatory strategies.

The Agreement sets the foundation for a number of initiatives that have been crucial in addressing water pollution in the Great Lakes. Monitoring programs, human health research and reporting processes have all come about as a result of the Agreement. The Agreement also propagated Remedial Action Plans (RAPs) and Lakewide Management Plans (LAMPs), which are discussed in more detail below. To this day, the Agreement provides a model for the management of a shared resource. No specific changes to the Agreement itself are recommended here. However, the commitment to implementing the Agreement has waned in recent years. The following sections analyze what the Ontario government is doing to live up to its obligations under GLWQA and what further action is needed.

**(b) The Canada-Ontario Agreement**

The GLWQA is supported by the Canada-Ontario Agreement (COA). COA is an agreement between the federal government and Ontario aimed at implementing the GLWQA. Since it was first signed in 1971, COA was a mechanism to provide fiscal transfers from the federal government to the provinces to assist the provinces in undertaking specific activities that would contribute to meeting the goals of the GLWQA, such as upgrading sewage treatment works. COA has been periodically renewed. In 1993, COA expired. For a period of approximately one year, the governments operated without the benefit of an agreement. In 1994, another COA was signed, which remains the operative agreement today.

The 1994 COA differs substantially from earlier COAs. First, it contains various targets and timelines for the elimination and reduction of emissions and for clean-up activities. Second, this version of COA contains no financial transfer arrangements. Third, the agreement, although called an agreement, is in fact a non-binding, good faith accord between the two levels of government. The 1994 COA expires in the year 2000.

**Recommendation: Canada-Ontario Agreement**

- When COA is renegotiated in 1999/2000, it is essential that Canada and Ontario commit to the goals and targets set out in the 1994 agreement. Transfer payments from the federal government to the province should be restored as in previous agreements.

**(c) Progress In Reducing Persistent Toxic Substances**

There is no doubt that the prevent and control pollution provisions of the 1994 COA agreement have set in place a process to further the reduction of persistent toxic substances. Since 1994, a number of reports have indicated the progress that has been made in achieving the goals under COA. However, the accuracy of these reports is debatable. It remains to be determined how much real progress has been achieved.

The *COA Stream 2 Annual Report* demonstrated that reduction in Tier 1 substances is underway and that target reductions are being met. However, the evidence relied upon to support this position came from the *Accelerated Reduction/Elimination of Toxics* (ARET) programme. Unfortunately, ARET is a voluntary programme and lacks accountability mechanisms. At least one study outlined the weaknesses with ARET and questioned the reliability of the results as promoted under COA.<sup>63</sup> It is clear that the target of destroying 50% of PCBs in storage will not be met in the near future. In fact, only 7% of the PCBs have been destroyed as of 1996. The recent closing of the U.S. border to shipments of PCB wastes from Canada and the current problems with PCB contamination from the Swan Hills

<u>Progress Under COA</u>	
Commitment	Progress (1997)
Confirm zero-discharge of five priority substances	Attained
Seek 90% reduction in use of seven other tier 1 substances	Varies from 85% to 20%
90% decommission of high-level PCBs	46% of Target
Destroy 50% of high-level PCBs	30% of Target
Accelerate the Destruction of low-level PCBs	20% of Target

incinerator in Alberta will make it more difficult for Ontario to meet the PCB destruction targets. Recent decisions indicate that other targets will not be met. For example, the recent decision by Ontario Hydro to enhance the province's power supply through fossil fuels will make it more difficult to meet the 90% reduction target for mercury.

### **Recommendation: Reducing Persistent Toxic Substances**

- The parties to COA should renew efforts to achieve the 90% reduction targets for the designated toxic substances and the 50% reduction in stored PCB's, developing workplans, regulatory measures, and interim targets developed as soon as possible.

#### **(d) Progress With Respect to Remedial Action and Lakewide Management Plans**

Remedial Action Plans (RAPs) set out actions and programmes that will be undertaken to restore ecosystem integrity to areas that have been identified as having significant environmental degradation and impaired uses. RAPs are a multi-stage process where all levels of government, industry, the public and other interests are to identify the impaired uses, develop options for remediation and then choose appropriate options. There are 42 RAPs in the Great Lakes, 12 of which are entirely within Canada, and 5 of which are binational sites. Canada and Ontario committed under COA to implement RAPs and delist nine areas of concern identified under the GLWQA by the year 2000, meaning that those sites would be remediated to an acceptable standard. Each level of government also committed to the restoration of 60% of impaired uses across all areas of concern on the Canadian side of the Great Lakes. With just one year left until the year 2000, only one of the nine areas of concern has been delisted, and only 13% of the beneficial uses have been restored.<sup>64</sup>

Even then, evidence has shown that the one Ontario RAP, Collingwood, that was delisted, may have been done too hastily. Two use impairments listed in the GLWQA have reappeared in the harbour. The consumption of various fish species in the harbour has been restricted due to the concentrations of PCBs in the fish. The levels of PCBs were higher in the harbour than in surrounding areas, indicating that the problem is from a local source, and should, therefore, have been addressed by the RAP.<sup>65</sup> The second impairment at Collingwood involved drinking water. In March of 1996, there was an outbreak of the parasite cryptosporidium. At least one hundred people were infected. The water quality problem was attributed to fecal runoff from an agricultural area upstream, a concern the RAP was to have addressed.<sup>66</sup> The Collingwood experience demonstrates the need for an objective and independent assessment to determine whether an area should be delisted or not.

Lakewide Management Plans (LAMPs) are designed on a lake-by-lake basis to address contaminants of concern, including both point and non-point inputs. In the Canada-Ontario Agreement, the province committed to developing a Stage 1 LAMP for Lake Superior by 1995 (which was achieved); for Lake Ontario by 1995 (a draft of which was released in 1997); and for Lake Erie by 1998. As of the fall of 1997, a Stage 2 LAMP for Lake Superior that was planned for in 1996 was expected to be finalized in mid-1998 (it actually wasn't signed off on by the governments until spring 1999); for Lake Ontario, the LAMP was due to be completed in 1997 (but it is predicted that a draft will not be released until 1999); and for Lake Erie, the LAMP is due to be completed in 2000.<sup>67</sup> There is controversy over the extent of public involvement in the development of some of the LAMPs. In particular, there has not been routine or regular public



involvement in the development of the Lake Ontario LAMP as the governments have relied only on occasional meetings.

### **Recommendations: Obligations under the Great Lakes Water Quality Agreement**

- The province, in cooperation with the federal government, should devote sufficient resources and leadership to speed up the cleanup of the Great Lakes areas of concern through Remedial Action Plans. Delisting of areas of concern should be assessed by an independent body once a comprehensive cleanup has been completed.
- The province should provide leadership in ensuring that the Lakewide Management Plans are completed within the committed timetable and that they are undertaken with sufficient public participation.

### **Exports and Diversions**

Perhaps one of the most important, but least recognized, threats to Ontario's waters lies in the potential for diversion and export of Ontario's waters.

Over the years, numerous proposals have been made to transport Ontario's water long distances through pipelines, canals and reservoirs to other areas in need of more water or cleaner water. Up until June of 1998, Ontario did not have a single legally enforceable mechanism of preventing water exports. Public outcry over a proposal to ship water from Lake Superior to Asia by supertanker forced the Minister of the Environment to issue the Surface Water Transfers Policy, which expressed a general opposition to any surface water transfers.

In December 1998, the MOE proposed to pass a regulation under the OWRA that would, in effect, entrench the "Surface Water Transfers Policy" in law. However, the proposed regulation still contained many significant exemptions that allow large water transfers to occur. The proposed regulation would still divide Ontario into three enormous water basins and only restrict transfers between these basins. Transfers between smaller but still significant basins would not be regulated. A regulation is also easier to amend at a later date than a statute. As of March 1999, this regulation had not been passed.

#### **NOVA PERMIT CAUSES OUTCRY**

On March 31, 1998, the MOE issued a five year water-taking permit to the NOVA group, allowing withdrawal by tanker of up to 600 billion litres of water from Lake Superior for transport to Asia. MOE officials did not evaluate the long term environmental, social or trade impacts of issuing this permit. After an immense public outcry from both sides of the border, the Minister of the Environment revoked the permit and adopted the interim Surface Water Transfers Policy which indicated that Ontario is "generally opposed" to proposals to divert water. However, this policy is not necessarily legally enforceable. This entire fiasco demonstrates the inability of the OWRA to deal with water diversion proposals and exemplifies the need to amend this Act.

At the present time, there is very little regulatory control over water export and diversion proposals. At the interjurisdictional level, Ontario signed the Great Lakes Charter. The Charter is a document concluded by the eight Great Lakes states, Ontario and Québec that obligates each state and province to give notice and consult with respect to diversion applications. However, it only requires the province to consult with other jurisdictions and applies to large-scale

diversions. For example, the permit to export water discussed above did not fall under the Charter because it did not involve enough water.

In 1989 Ontario passed the *Water Transfer Control Act*. This act owes its existence to the debate in the late 1980s concerning the Free Trade Agreement. There was fear that water would become a commodity under the FTA resulting in a loss of sovereignty and control over water resources. However, ten years later this Act has not been proclaimed. Moreover, the law is inadequate because it does not ban such exports. Otherwise, Ontario has no laws governing water exports. The OWRA has no specific provisions dealing with water diversions, even between watersheds within Ontario's jurisdiction. In any event, it was not designed to deal with such a large issue. Yet this government continues to rely upon the OWRA to control water transfers.

### **Recommendation: Banning Water Exports**

- The provincial government should repeal the *Water Transfer Control Act*, substantially amend the *Ontario Water Resources Act* to take a proactive and comprehensive approach to water management in Ontario, and enact a new law, the *Sustainable Water Act*, banning water transfers between different watersheds.

## SUMMARY OF RECOMMENDATIONS

- Ontario should develop a comprehensive water policy that provides a framework that is applied consistently to all decisions regarding water under its mandate and in coordination with other jurisdictions. The policy must:
  - (a) make a clear public commitment to the principle that there must always be adequate quantities of clean water to support a variety of uses in the province, the uppermost being the ecological function of water;
  - (b) establish a hierarchy of uses of water to ensure that the most important uses are given priority over less important uses. The order of uses should be as follows: preservation of ecosystem function, provision of potable water, provision of water for irrigation, recreational, industrial and commercial uses on a proportional basis, and lastly, waste disposal;
  - (c) incorporate the precautionary principle as a basis for decision-making and place the onus on the party proposing to use water to demonstrate that there will be no negative impacts on the ecological function of water from that use; and
  - (d) develop a means of coordinating water management initiatives and decision-making among provincial bodies and with other jurisdictions.
  
- The policy should be supported by the following government initiatives that must be maintained on an ongoing basis:
  - (a) development of an ecosystem approach to water management by identifying links between water quality and quantity with land use patterns and economic activity, links between transboundary and domestic air pollution and water quality, and considering synergistic and cumulative impacts of water uses;
  - (b) maintenance of a monitoring network governing both water use and water quality with the information being publicly accessible;
  - (c) promotion of research into water quality and quantity issues, including new innovative solutions, whether it be technological, demand management or public education;
  - (d) publication of annual reports that outline progress in implementing the policy and those reports should be assessed by an arm's length agency such as the Ontario Auditor or the Environmental Commissioner of Ontario; and

(e) provision of adequate funding and resources to carry out these and existing programmes effectively.

- The province should enact a *Pollution Prevention Planning Act* that requires all companies that discharge wastes into water to report annually on their use, production, release, disposal and transfer of toxic substances. Companies should then be required to develop and implement a plan for reducing and eliminating their use of toxic substances.
- The province should commit to the goal of zero discharge for toxic substances. The process of identifying candidate substances for bans and phase-outs should be accelerated. Once the substances have been identified, regulatory measures should be taken to ensure that these substances are eliminated in a timely fashion. Transition plans should also be developed where the ban or phase-out of the substances will result in inequities for workers or communities.
- Voluntary measures should only be used in conjunction with, not in place of, a strong and comprehensive regulatory base. Voluntary measures, which are developed under public scrutiny and contain a means of holding participants accountable for failing to meet their objectives, may be useful in achieving results over and above minimum standards in some instances.
- The Provincial Water Quality Objectives (PWQOs) should be converted into legally binding standards. Such standards should be enforceable in and of themselves, but should also be incorporated into certificates of approvals for water discharges.
- Each PWQO standard should be reviewed every five years to ensure that each standard is stringent enough to keep Ontario's waters clean. The reviews should be based on a sound scientific assessment that includes peer review, reflects the precautionary principle, and takes into account:
  - (a) both the lethal and chronic impacts on human health;
  - (b) the impact of substances on sensitive populations, such as children, aboriginal peoples, pregnant women, and the elderly;
  - (c) any potential adverse effects on the environment; and
  - (d) the synergistic, additive and cumulative effects.
- MISA should be amended as follows:
  - (a) add a requirement that each standard be reviewed every five years to ensure that the benefits of new technologies are translated into more stringent standards;
  - (b) impose loading caps that establish absolute discharge limits on facilities;
  - (c) require annual reporting on the extent to which MISA has achieved its goals and providing public access to reporting data; and

(d) reverse the recent amendments that reduced reporting requirements and commit to reduce AOX emissions to zero by the year 2002.

- Over the long-term, MISA and the PWQOs should be amalgamated into one comprehensive set of legally binding baseline emissions standards based upon the best available control technology. These standards should apply to all dischargers. These standards should be viewed as minimum baseline standards only and should not in any way inhibit the pollution prevention measures set out in earlier recommendations.
- The province should immediately develop a set of pre-treatment standards for discharges to sewers with a view to having the standards in place by 2002. The standards should be legally binding and include both conventional and toxic pollutants.
- The province should take a more active role in persuading municipalities to pass and enforce the model by-law, with financial incentives for those municipalities that do so or penalties for those that fail to do so.
- As part of the Sustainable Water Policy outlined in our first recommendation, the Ministry of the Environment should renew its efforts to develop an integrated and comprehensive groundwater management regime that will be applied in a consistent manner by all ministries, government agencies, and municipalities. The strategy should clearly restrict other activities unless it can be demonstrated that they will not adversely impact groundwater.
- The Ministry of Environment should undertake a long-term monitoring project and develop an inventory of groundwater resources. The project should include information regarding water-well records, details of complaints, inspections and enforcement, and information about contamination and remediation, all of which should be publicly accessible.
- Important aquifers, groundwater recharge zones, and areas that are sensitive to groundwater pollution should be identified. These designated areas should be protected and land uses that can take place in those areas be legally restricted under the *Planning Act*.
- The recommendations of the Commission on Planning and Development Reform concerning inspection requirements for existing septic systems, the need for septage disposal facilities and educational programmes for owners of septic systems should be implemented.
- A requirement should be made that septic system approvals be obtained in advance of planning approvals for developments via rezoning, severance, building permits or other approvals where a septic system will be required.
- Training and education should be provided to the Building Code Commission and inspectors to ensure they have the necessary expertise to evaluate the public health and environmental implications of both routine and innovative septic systems.

- A study of sources of groundwater contamination should be conducted to determine the extent to which these sources, including their cumulative impacts, pose a threat to Ontario's water resources.
- The use and application of dust suppressants, road salt, and pesticides must be regulated. There should be programmes that encourage alternatives to these substances.
- A fund should be created to pay for the remediation of abandoned contaminated sites and underground storage tanks. The fund should be financed by means of a user fee on new related activities.
- The government should pass legally binding standards regulating leachate from landfill sites and governing the maintenance of storage tanks.
- The province should enact a *Safe Drinking Water Act*. Essential features of the Act would include the following components:
  - (a) mandatory regulations specifying maximum levels of substances in drinking water that protect human health and provide clean and odour free water;
  - (b) required monitoring and notification of any violations or any failure to perform any required duties;
  - (c) required research into methods of treating drinking water that would reduce or eliminate the presence of organic chemicals from the finished water and the establishment of a drinking water advisory council;
  - (d) the ability for citizens to bring a court action for violation of the statute and a judicial review application where the government has failed to perform a duty; and
  - (e) the act would apply to both public and private water systems.
- The province should continue its efforts to further develop an effective conservation strategy and ensure that it is implemented by the year 2002. This conservation strategy must be an integral part of the sustainable water policy in our first recommendation and at a minimum should include the following:
  - (a) comprehensive educational programmes for industry and the public on water conservation;
  - (b) amendments to the building code and other such acts to ensure that new homes and industrial facilities are fitted with water efficient appliances and processes;
  - (c) mandatory water conservation programmes pertaining to retrofitting homes and industrial processes;
  - (d) prohibition on the funding of water or sewer expansion projects unless municipalities can demonstrate that they have undertaken water conservation measures;

- (e) the development of specific programs to reduce agricultural use of water; and
- (f) review of the pricing of water to ensure consumers understand the cost of water.
- The province should renew efforts to develop watershed planning as a decision-making tool. Conservation authorities should be provided with the mandate and the necessary resources to implement watershed planning.
- A comprehensive groundwater strategy should seek to protect and conserve groundwater resources. Significant aquifers and groundwater recharge areas should be identified and land use practices that may occur in or adjacent to these areas should be restricted under the *Planning Act*.
- Water taking permits should be issued on the basis of a hierarchy of uses as follows: preservation of ecosystem function, provision of potable water, and provision of water for irrigation, recreational, industrial and commercial uses on a proportional as opposed to a first come, first serve basis.
- When COA is renegotiated in 1999/2000, it is essential that Canada and Ontario commit to the goals and targets set out in the 1994 agreement. Transfer payments from the federal government to the province should be restored as in previous agreements.
- The parties to COA should renew efforts to achieve the 90% reduction targets for the designated toxic substances and the 50% reduction in stored PCB's, developing workplans, regulatory measures, and interim targets developed as soon as possible.
- The province, in cooperation with the federal government, should devote sufficient resources and leadership to speed up the cleanup of the Great Lakes areas of concern through Remedial Action Plans. Delisting of areas of concern should be assessed by an independent body once a comprehensive cleanup has been completed.
- The province should provide leadership in ensuring that the Lakewide Management Plans are completed within the committed timetable and that they are undertaken with sufficient public participation.
- The provincial government should repeal the *Water Transfer Control Act*, substantially amend the *Ontario Water Resources Act* to take a proactive and comprehensive approach to water management in Ontario, and enact a new law, the *Sustainable Water Act*, which would ban water transfers between different watersheds.

## ACRONYMS

BATEA -	Best Available Control Technology Economically Achievable
COA -	Canada-Ontario Agreement
CofA -	Certificate of Approval
EBR -	Environmental Bill of Rights
EPA -	Environmental Protection Act
FTA -	Free Trade Agreement
GLWQA -	Great Lakes Water Quality Agreement
LAMPs -	Lake-Wide Management Plans
MISA -	Municipal-Industrial Strategy for Abatement
NAFTA -	North American Free Trade Agreement
MOE -	Ministry of the Environment
MOU -	Memorandum of Understanding
ODWO -	Ontario Drinking Water Objectives
OWRA -	Ontario Water Resources Act
PWQO -	Provincial Water Quality Objectives
RAPs -	Remedial Action Plans



## ENDNOTES

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# ***An Environmental Agenda for Ontario***

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17 Major Street, Kitchener Ontario, N2H 4R1  
Phone: (519) 744-7503 Fax: (519) 744-1546  
E-mail: [jjackson@web.net](mailto:jjackson@web.net)

## **HAZARDOUS WASTES AND TOXIC SUBSTANCES**

Background Paper prepared by:

Mark S. Winfield, Ph.D.  
Canadian Institute for Environmental Law and Policy

for

The Environmental Agenda for Ontario Project

March 1999





# ENVIRONMENTAL AGENDA FOR ONTARIO BACKGROUND PAPER<sup>1</sup>

## HAZARDOUS WASTES AND TOXIC SUBSTANCES

by  
Mark S. Winfield<sup>2</sup>

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<sup>1</sup>.This paper is one of nine research studies prepared for the Environmental Agenda for Ontario Project. The other studies include: Air Quality; Water; Energy; Food and Agriculture; Biodiversity Conservation; Natural Resources Management; Human Settlements; Solid Waste Management; and Democracy.

<sup>2</sup>.Director of Research, Canadian Institute for Environmental Law and Policy.

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## **EXECUTIVE SUMMARY**

Ontario industries and institutions generate between 1.2 and 5 million tonnes of toxic, explosive, flammable, reactive, pathological, corrosive or otherwise hazardous wastes each year, accounting for approximately 60% the total produced in Canada. The past four years have witnessed a dramatic growth in the generation of hazardous wastes by Ontario industry, with a reported 50% increase in wastes sent-off site for disposal between 1994 and 1997. In addition, imports of hazardous waste from the United States into Ontario for 'recycling' and disposal grew by a factor of more than four times between 1993 and 1997.

Virtually all of the fates of hazardous waste, including incineration, landfilling, disposal in municipal sewer systems, and even reuse or recycling, have the potential to pose threats to the public health and safety and the environment. Despite this, the province lacks basic information about the generation and fate of hazardous waste in Ontario. It doesn't, for example, have a reliable estimate of the total generation of hazardous waste by Ontario industry, or how much is discharged into Ontario's lakes and rivers, or into municipal sewer systems, each year.

There are major gaps in the framework of laws and regulations for controlling the handling and disposal of hazardous wastes. There are, for example, no provincial controls at all on the disposal of hazardous wastes into municipal sewer systems. According to some estimates, this is one of the leading fates of such wastes in Ontario. The province also lacks modern emission standards for hazardous or biomedical waste incinerators, and continues to permit the disposal of liquid industrial wastes as 'dust suppressants' on rural roads.

Many hazardous waste 'recycling' sites continue to operate under exemptions for the normal rules for waste handling facilities. This continues to be the case even after the disastrous July 1997 Plastimet plastics 'recycling' site fire in Hamilton, and the long history of the operation of illegal disposal facilities under the guise of 'recycling' in the province.

A thorough overhaul and modernization of the province's laws and regulations regarding the generation, handling and disposal of hazardous wastes is needed. This is necessary to ensure the protection of public safety, health and the environment, and to promote a long term solution to the province's hazardous waste crisis through waste reduction and pollution prevention. Such an undertaking would include the following measures.

### **Recommendations**

1. The province should undertake major reforms to its regulatory framework for the generation, handling and disposal of hazardous wastes. These should include:
  - the strengthening of regulatory controls on waste 'recycling' and 'processing' operations;
  - the establishment of stringent approval, emission and operating standards

- for hazardous and biomedical waste incinerators and facilities burning hazardous waste as 'fuel;'
  - the development and implementation of provincial standards for industrial discharges to sewers;
  - the adoption of severe restrictions on the land disposal of hazardous and liquid industrial wastes; and
  - the imposition of a ban on disposal of such wastes as 'dust suppressants.'
2. Facilities that generate or handle hazardous waste should be required to provide an annual report to the province on the generation, composition and fate of all of their designated non-product outputs. The province should publish an annual report on the the management of hazardous wastes in Ontario on the basis of this information.
  3. The province should adopt a *Pollution Prevention Planning Act*, following the model of successful legislation in the states of Massachusetts and New Jersey, to require facilities to develop plans to reduce their use of toxic substances and generation of hazardous wastes.
  4. The province should impose a per tonne charge on the generation of hazardous wastes by industry to encourage waste reduction. The revenues generated through the charge should be used to support programs to regulate and prevent pollution, emergency and spills response, and the remediation contaminated sites.
  5. The province should revise its standards for air and water pollution and pesticides to target the substances on the primary candidates substances list of its 1993 Canadidate Substances List for Bans or Phase-Outs for virtual elimination, defined as the cessation of the use, generation or release to the environment of these substances.
  6. The province should adopt a comprehensive policy and new legislation on the remediation of contaminated sites. This should address the allocation of liability, the creation of an 'orphan' sites remediation fund, clean-up standards, and the establishment of a publicly accessible registry of contaminated sites in Ontario.
  7. The province should establish life-cycle producer responsibility requirements for the collection, recycling and disposal of products which may become household hazardous wastes, such as waste oil, paint, pesticides, fuels, batteries and solvents. The establishment of deposit/refund and return to retailer requirements should be considered for products for which producer responsibility arrangements are not made by manufacturers or retailers.
  8. The province should adopt a regulation designating all new or expanded hazardous waste treatment or disposal facilities for review under the *Environmental Assessment Act*. The *Environmental Protection Act* should be amended to require public hearings before the Environmental Assessment Board under the prior to the approval of such facilities. Provision should be made for

intervenor funding to *bona fide* public interest intervenors in such hearings.

9. The province should move towards the establishment of policy and regulatory system that controls the generation, use, handling and disposal of materials on the basis of their hazardous properties, regardless of whether they are a 'product,' 'recyclable material' or 'waste.'

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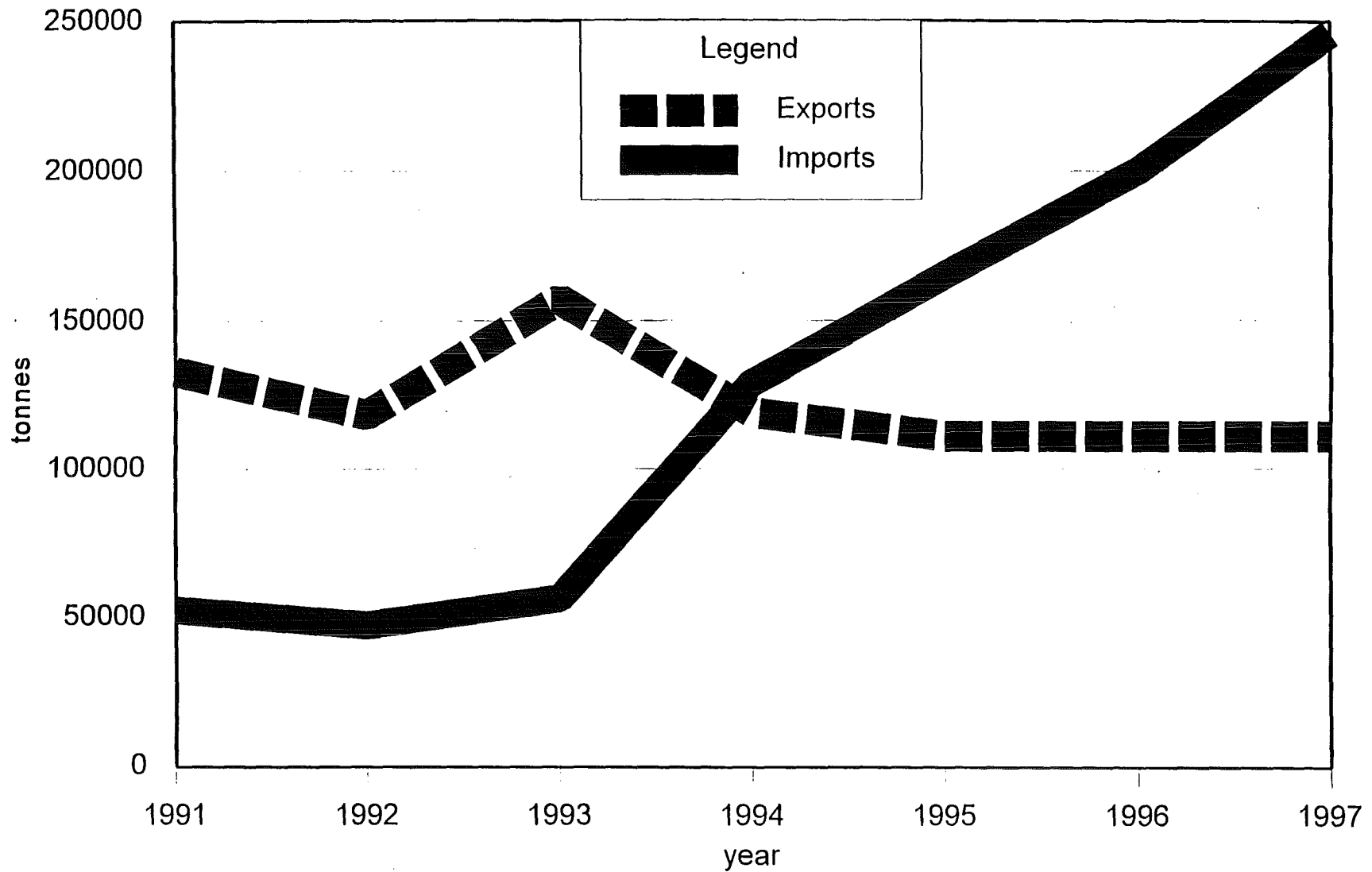
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# Hazardous Waste Imports / Exports

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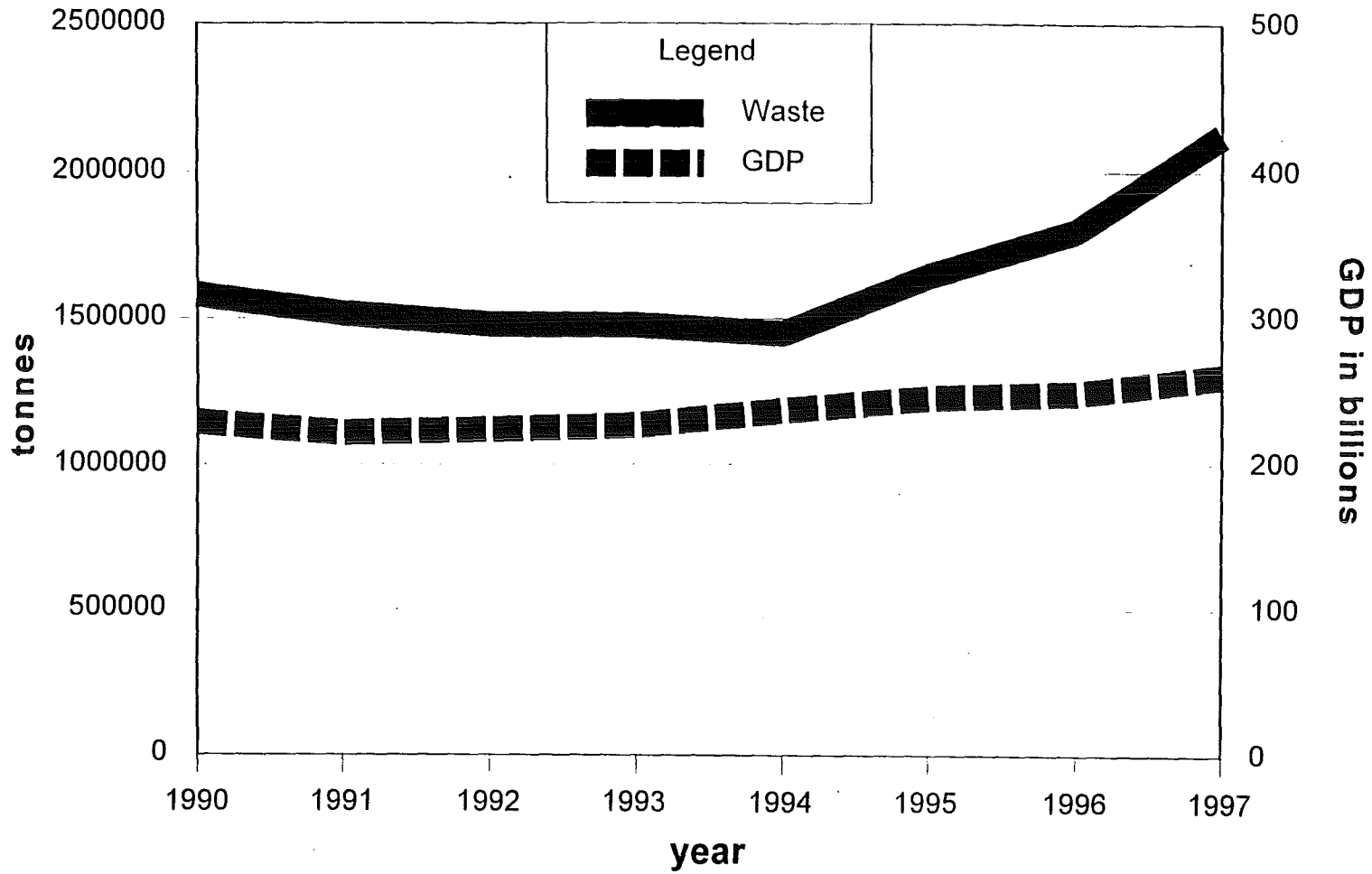
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## ENVIRONMENTAL AGENDA FOR ONTARIO BACKGROUND PAPER:

### HAZARDOUS WASTES AND TOXIC SUBSTANCES

"Ontario's focus needs to change from one of granting regulatory relief to polluters to improving its commitments to the health of its residents and the natural environment."<sup>1</sup>

*Eva Ligeti*, Environmental Commissioner for Ontario, April 1998.

#### INTRODUCTION

Ontario is by far Canada's largest generator of hazardous wastes, producing between 1.2<sup>2</sup> and 5 million<sup>3</sup> tonnes per year. This accounts, by some estimates, nearly 60% of the total generation of hazardous wastes in Canada.<sup>4</sup> As of 1996, the most recent year for which data is available, there were approximately 32,000 facilities registered with the province as hazardous waste generators.<sup>5</sup>

At one time, the province of Ontario was in the forefront of efforts to control and reduce the generation and disposal of hazardous wastes in North America. However, the province's regulatory framework for the management of hazardous wastes has been static for more than a decade, and is becoming increasingly outdated in comparison to other jurisdictions. In addition, longstanding gaps in the system, identified by the Provincial Auditor,<sup>6</sup> the Ministry of the Environment itself,<sup>7</sup> and others<sup>8</sup> have remained unaddressed.

#### DEFINING HAZARDOUS WASTES

Hazardous wastes are defined for the purposes of this paper as non-product output from industrial, commercial, institutional and residential sources that has the potential to cause harm to human health, safety or the environment. This includes wastes meeting the technical and legal definitions of hazardous wastes in Ontario, along with other types of wastes, such as liquid industrial wastes, which are subject to the similar regulatory requirements.

The need for reform has been highlighted by such recent disasters, as the July 1997 Plastimet PVC recycling site fire, and the continuing evidence of the illegal disposal of hazardous wastes.<sup>9</sup> In fact, a report released by the federal Solicitor-General's department in August 1998, assessed environmental crime, particularly the improper storage or disposal of hazardous wastes, as being second only to illicit drugs in its impact on Canada.<sup>10</sup>

## THE PLASTIMET FIRE

The Plastimet fire started on July 9, 1997, and raged for three days in a mixed industrial and residential neighbourhood of the City of Hamilton. It consumed 400 tonnes of plastic, including polyvinyl chloride (PVC), and resulted in a one day evacuation of area residents because of fears of airborne toxics. (One of the by-products of PVC combustion is dioxin, an extremely toxic substance that is thought to cause cancer and disruptions to endocrine systems.

The Plastimet facility had been granted an exemption from the requirement to obtain a Certificate of Approval under the *Environmental Protection Act* by the Ministry of the Environment on the basis that it was storing recyclables to meet a "realistic" market demand, as per the 'recycling' facility exemption in Regulation 347.

At the request of the Solicitor-General, the Ontario Fire Marshal investigated the fire. In its August 1997 report, the Office of the Fire Marshal concluded that:

"It is evident there is a potential for other fires, similar to the Plastimet fire, to occur in Ontario."

As a result, the Office recommended that the Ministry of the Environment strengthen its regulatory controls on recycling and other waste handling operations.

In her 1997 Annual Report to the Legislature, the Environmental Commissioner for Ontario noted that the Ministry of the Environment had failed to demonstrate any 'realistic market demand' for the plastics stored at Plastimet, and that the Ministry was proposing to maintain the 'recycling' site exemption and to allow more types of recyclable materials to be exempt from waste approvals in its proposed reforms to the province's waste management regulations.

**Adapted from:** Environmental Commissioner of Ontario, *1997 Annual Report*, pg.67.

## A Policy Framework for Hazardous Waste Management in Ontario

The province's regulatory and policy framework for the management of hazardous wastes should seek to achieve three basic goals. First, the system must ensure the protection of public safety, public health and the environment in the handling and disposal of hazardous wastes and materials. In order to achieve this goal, the regulatory system must ensure that the generation, handling and fate of wastes are known and under some form of public oversight. Standards for the protection of public safety, health and the protection of the environment should be in place, including bans and phase-outs the generation of certain types of wastes, and prohibitions on certain treatment and disposal practices, where necessary.

### DEFINING POLLUTION PREVENTION

In July 1995 the federal government adopted the following definition of pollution prevention:

"The use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and waste, and reduce overall risk to human health or the environment"

**Source:** Government of Canada, *Pollution Prevention: A Federal Strategy for Action*, July 1995.

Secondly, it should provide comprehensive, accurate, and publicly available information on the generation, sources, composition and fate of hazardous wastes in the province. This is essential from the perspectives of the right of members of the public to know about the wastes generated in, transported through, or disposed of within their communities, good public policy decision-making, and government and industry accountability for their environmental policies and activities.

Third, the province's regulatory and policy structures must promote waste reduction at source through pollution prevention. This emphasis reflects the degree to which virtually all of the fates of hazardous wastes, once generated, have the potential to cause harm to the environment and human health and safety.

### HAZARDOUS WASTE GENERATION, COMPOSITION AND FATE IN ONTARIO

It is difficult to draw clear conclusions regarding the status of hazardous management in the province. This is a result of the unreliability of key data sources, such as the Ontario Waste Generator Registry Database,<sup>11</sup> and the limited scope of others, such as the federal National Pollutant Release Inventory (NPRI).<sup>12</sup> These problems are compounded by differences in the definitions and the scope of the different reporting systems. In some cases, these lead to quantitative, and even qualitative, contradictions.

The challenges in assembling a complete picture are particularly acute with respect to on-site treatment and disposal. This fate is not captured by the provincial Waste Manifest system, which is generally regarded as the most reliable source of information, as it only deals with wastes which are transferred off-site for treatment, disposal or recycling. Significant gaps exist in the NPRI's coverage of the on-site fates of reported substances, and serious questions have been raised by the Provincial Auditor<sup>13</sup> and others<sup>14</sup> regarding the reliability of the Waste Generator Database data.

The most recent published estimates of the total generation of hazardous wastes in Ontario, based on 1991 Waste Generator Database data, range from 1.15<sup>15</sup> to 3 million tonnes per year.<sup>16</sup> In its November 1994 decision regarding the Ontario Waste Management Corporation's proposed hazardous waste treatment and disposal facility, the Environmental Assessment Board accepted an estimate that hazardous waste

#### THE ONTARIO WASTE MANAGEMENT CORPORATION

The Ontario Waste Management Corporation (OWMC) was a Crown Corporation, created in 1980, to construct a comprehensive hazardous waste treatment and disposal facility for Ontario. The OWMC's undertaking was designated for review under the *Environmental Assessment Act* in 1985. Hearings before a Joint Board of the Environmental Assessment Board and the Ontario Municipal Board commenced in 1989. In November 1994, the Joint Board rejected the Corporation's application for approval of its proposed facility, to be located in Lincoln, Ontario. The Provincial cabinet rejected an appeal of the Board's decision by the OWMC in February 1995. The OWMC was dissolved in September 1995.

generation in Ontario could be expected to rise at a rate of approximately 3% per year.

However, more recent data from the Ontario Waste Manifest Database System<sup>17</sup> and the National Pollutant Release Inventory<sup>18</sup> have indicated a dramatic rise in the amounts of hazardous wastes and pollutants being transferred off the site of their generation for disposal in Ontario over the past few years.

**Table 1** shows a total of 2.1 million tonnes of hazardous waste manifested in 1997, a growth of approximately 50% since 1994. This growth has been attributed to increases in economic activity by the provincial government. However, the growth in waste generation exceeds the growth in the province's gross domestic product for the 1994-97 period by a factor of more than three to one.<sup>19</sup>

**Table 1 Off-site Hazardous and Liquid Industrial Waste Disposal in Ontario**

Year	Total Manifest Data (Tonnes)
1990	1,579,799
1991	1,516,272
1992	1,478,088
1993	1,476,661
1994	1,447,448
1995	1,646,382
1996	1,800,000
1997	2,125,000

Data on waste transfers in Ontario from the NRPI for the 1994-1996 reporting years is presented in **Table 2**.

**Table 2 National Pollutant Release Inventory Pollutant Transfers in Waste: Ontario 1994-1996**

Year	Transfers of Toxic and Carcinogenic Pollutants (Tonnes)	Transfers of All Pollutants (Tonnes)
1994	N/A	22,222 <sup>20</sup>
1995	5,218	33,922
1996	4,595 <sup>21</sup>	42,643 <sup>22</sup>

As shown in **Table 3** the chemical and allied products, primary and fabricated metals, paper and allied products, and petroleum refining sectors are generally identified as being among the leading generators of hazardous wastes in the province.

**Table 3: Ontario Hazardous Waste Generation by Industrial Sector (1991)**

Sector	Quantity (tonnes)	% of Total
Refined Petroleum and Coal Products Industries	338,684	22%
Paper and Allied Products Industries	254,143	16%
Fabricated Metal products Industries	203,834	13%
Primary Metals Industries	141,528	9%
Transportation Equipment Industries	141,078	9%
Mining Industries	81,339	5%
Chemical and Chemical Products Industries	79,741	5%
Leather and Allied Products	68,120	4%
Local Government Service Industries	62,990	4%
Other Utilities	38,063	2%
Other Service Industries	31,073	2%
Rubber Products Industries	17,691	1%
Transportation Industries	17,390	1%
Health and Social Service Industries	10,772	1%
Electrical and Electronic Products Industries	6,398	< 1%
<b>Total</b>	<b>1,492,808</b>	<b>97%</b>

As **Table 4** indicates, heavy metal solutions and residuals, sludges and inorganic residuals, organic solvents and sludges, landfill leachates, and waste oil are usually identified as the largest elements of the waste stream by weight.

**Table 4 : Ontario Hazardous Waste Stream Composition**

Waste Category	OWMC (1988) (Including Liquid Industrial Waste but Excluding Registerable Solid Waste)		Canadian Hazardous Waste Inventory (1991) (Excluding Liquid Industrial Waste and Registerable solid waste)	
	Quantity (Tonnes)	% of Total	Quantity (Tonnes)	% of Total
Heavy Metal Solutions and Residuals	2333600	65.1%	785474	51%
Sludges and Inorganic Residuals	112800	3.1%	282740	18%
Solvents and Organic Solutions	185900	5.2%	142442	9%
Anion Complexes	3200	0.1%	85758	6%
Clean-up Residuals	8200	0.2%	69434	4%
Organic and Oily Wastes	219200	6.1%	67327	4%
Oils and Greases	41400	1.2%	32132	2%
Misc. Chemicals and Products	15000	0.4%	28623	2%
Organic Sludges and Still Bottoms (no oil)	50700	1.4%	20785	1%
Paint and Organic Residuals	68700	1.9%	13490	1%
Aqueous Solutions with Organics	521300	14.6%	13322	1%
Oil/Water Mixtures	21600	0.6%	2148	< 1%
Pesticides and Herbicide Wastes	400	0.0%	1262	< 1%
<b>Total</b>	<b>3582000</b>	<b>100%</b>	<b>1544937</b>	<b>100%</b>

Discharges to municipal sewer systems, followed by discharges to on-site treatment and then to surface waters, were identified by the OWMC as the leading fates of hazardous wastes disposed of on-site in Ontario. This was followed by landfilling or landfarming, other forms of treatment, incineration, and use as dust suppressants. These fates are outlined in **Table 5**. The NPRI data indicates that direct releases to the atmosphere, which are not reported under the provincial Waste Generator Registry Database, are also a significant fate, particularly for organic solvents like toluene and xylenes.<sup>23</sup>



**Table 5: Fate of Wastes Disposed of On-Site (1991)**

Method of Disposal	Total Excluding Liquid Industrial and Registerable Solid Wastes		Total Subject Wastes	
	Quantity (Tonnes)	Percent of Total	Quantity (Tonnes)	Percent of Total
Sanitary Sewer	383300	38%	394000	27%
Water Pollution Control Plant	266500	27%	384200	27%
Landfill/Landfarm	260600	26%	371100	26%
Other Treatment	122600	12%	143000	10%
Incineration	35800	3.5%	112000	8%
Dust Suppression	1600	1.6%	29400	2%
Waste-Derived Fuel	100	0.1%	500	0.07%
<b>Total</b>	<b>1070500</b>	<b>100%</b>	<b>1434200</b>	<b>100%</b>

The fates of wastes transferred off-site for disposal are outlined in **Table 6**. These include incineration, processing and landfilling. The largest element of the 'subject' waste stream transferred off-site for disposal is the shipment of landfill leachate to sewage treatment plants for disposal. In some cases, landfills have direct connections to municipal sewer systems for leachate disposal. The amounts of leachate dealt with in this way are not reported to the province.

**Table 6: Off-Site Disposal of Ontario Subject Waste 1993 and 1995**

Receiver type	1993 <sup>24</sup> (Tonnes)	1995 <sup>25</sup> (Tonnes)
Landfill (Commercial)	90,000	64,473
Private Landfill/Sludge Farm	30,000	42,931
WPCP (Water Pollution Control (Sewage Treatment) Plant)	530,000	481,990
Transfer Station	n/a	233,277
Transfer Station & Processing	200,000	285,358
Export	190,000	180,666
Incineration	60,000	54,172
Reclaimer	110,000	69,561
Dust Suppression	55,000	17,310
<b>Total</b>	<b>1,265,000</b>	<b>1,428,874</b>

## Hazardous Waste Imports and Exports

As shown in **Table 7**, imports of hazardous wastes into Ontario have risen dramatically over the past few years, growing by a factor of more than four times since 1993.<sup>26</sup> Ontario has been identified the leading importer of Toxic Release Inventory (TRI) substances from the U.S for 'recycling' and disposal in North America.<sup>27</sup>

**Table 7: Ontario Hazardous Waste Imports from Other Jurisdictions**

Year	International Waste Imports (Tonnes)
1991	52,510
1992	47,265
1993	56,439
1994	129,188
1995	N/A
1996	N/A
1997	246,000

Figures regarding the composition of hazardous waste imports into Ontario are not available. The most recently available figures for the composition of hazardous waste imports to all of Canada are presented in **Table 8**.

**Table 8: Composition of Hazardous Waste Imports to Canada (1995)<sup>28</sup>**

Waste Class	Quantity (Tonnes)	Per Cent of Total
Leachable Toxic Wastes	117,239	30%
Corrosive Liquids	109,193	28.5%
Battery Wastes	76,627	20.0%
Environmentally Hazardous Substances	21,456	5.6%
Flammable Liquids	21,072	5.5%
Metal and Mineral Wastes	13,793	3.6%
Other	approx: 23,000	6.2%
<b>Total</b>	<b>383,134</b>	<b>100%</b>

As **Table 9** indicates, exports of hazardous wastes from Ontario appear to be roughly stable.<sup>29</sup> There is no reported transboundary traffic in hazardous wastes from Ontario to destinations outside of Canada other than the U.S. The dramatic growth in imports of hazardous wastes from the United States may reflect the strengthening of

regulatory controls on the land disposal of hazardous wastes in that country,<sup>30</sup> while controls in Ontario have remained static or, in some cases, been weakened.

**Table 9: Ontario Hazardous Waste Exports to Other Jurisdictions**

Year	International Waste Exports (Tonnes)
1991	133,177
1992	118,367
1993	156,945
1994	118,853
1995	N/A
1996	N/A
1997	111,000

The composition of all Canadian hazardous waste exports to the United States in 1995 is outlined in **Table 10**.

**Table 10: Composition of Canadian Hazardous Waste Exports (1995)<sup>31</sup>**

Waste Class	Quantity (tonnes)	Per Cent of Total
Metals and Mineral Wastes	66,215	29.3%
Battery Wastes	52,429	23.2%
Corrosive Liquids	42,486	18.8%
Flammable Liquids	23,955	10.6%
Leachable Toxic Wastes	12,881	5.7%
Environmentally Hazardous Waste	8,362	3.7%
Other	19,660	8.7%
<b>Total</b>	<b>225,989</b>	<b>100%</b>

### **The Environmental Impacts of Hazardous Waste Diposal**

Virtually all of the fates of hazardous wastes generated or imported into Ontario are associated with significant environmental impacts. Discharges of hazardous wastes to municipal sewer systems can, for example, interfere with sewage treatment plant operations, damage pipes and other facilities, pose occupational health and safety risks to plant staff, result in discharges of hazardous pollutants in plant effluent, and the

contamination of sewage sludge with toxic substances.<sup>32</sup>

The incineration of hazardous wastes, or their burning as fuel for energy recovery has been associated with emissions of a wide range of conventional and toxic

**Case Study: Varnicolor Chemical Ltd**

On September 3, 1992, Justice of the Peace Sharon Woodworth sent Severin Argenton to jail for eight months for allowing toxic wastes to contaminate the environment. This marked the longest prison term in Canadian history for an offence against the environment. Mr. Argenton was the president and owner of Varnicolor Chemical Limited which operated a hazardous waste disposal site in Elmira.

Varnicolor held a ministry Certificate of Approval (C of A) for recycling solvents, mostly waste paints. The recycled solvents were sold back to industry. The residues were bulked for disposal as waste derived fuel in the United States. However, after the passage of Ontario Regulation 309 under the EPA, Varnicolor began expanding its business without ministry approval. The company wanted to take advantage of increasing demands for cheap alternative hazardous waste disposal.

Varnicolor began accepting many different kinds of hazardous waste for storage purposes. Under its C of A, the company was not permitted to do this. Its laboratory was not equipped to analyze the materials received and there was no inventory system to monitor what came in and what went out. At one point, liquid waste described by Varnicolor as waste-derived fuel was rejected upon delivery by a disposal company in Michigan, because the load contained unacceptable levels of PCB's.

Acting on an employee's leaked story

to the media about the Varnicolor facility, the Ministry of the Environment conducted an audit of the operation between April and June 1990.

While the details of the case and the variety of violations are lengthy, the situation can be summarized.

In carrying on their business transactions, Varnicolor and Mr. Argenton had illegally stored thousands of drums of hazardous chemicals on the Elmira property. The 5,700 drums on the site were not protected by roofing and many were placed directly on the ground, not on concrete pads. When 583 of the drums leaked, chemicals seeped into the soil contaminating local groundwater. The groundwater flowed into a creek, connected to the Grand River, the source of drinking water for the City of Brantford and the Regional Municipality of Waterloo.

Among the chemicals stored at Varnicolor were chlorinated solvents, of which some types can cause cancer.

The first charges in the case were laid on July 27, 1990. In the end a total of 42 charges were laid against Mr. Argenton, Varnicolor and related defendants. All of the defendants originally pleaded not guilty.

Cleanup costs for the site have been estimated at \$2.5 million.

**Excerpted from; Offences Against the Environment: Environmental Convictions in Ontario 1992** (Toronto: Ministry of the Environment, 1993).pp.7-8.

pollutants.<sup>33</sup> In addition, the resulting ash must itself be disposed of as a hazardous waste. Landfilling or landfarming may result in the contamination of ground or surface

waters.<sup>34</sup> Processing, treatment and recycling activities may result in emissions and discharges of their own, and the generation of sludges and other residuals which are themselves hazardous wastes. Recycling and off-site treatment or processing may also involve the storage of hazardous wastes for extended periods, posing risks of fire or spills.<sup>35</sup> Transfers off-site also carry the risks of spills or accident during transport, and there is a history of the illegal disposal activities under the guise of 'recycling' in the province.<sup>36</sup>

## Hazardous Waste Information

The composition and fate of some elements of the Ontario hazardous waste stream, such as PCB's<sup>37</sup> and biomedical wastes,<sup>38</sup> are relatively well documented. However, there are many others about very little information is publicly available. Recycling, for example, is the largest reported fate of NPRI substances in the province,<sup>39</sup> although this does not appear to be reflected in the Ontario Waste Manifest Database, where the reported amounts of waste going to 'reclamation' (recycling) have declined significantly over the past few years.<sup>40</sup> This suggests that there may be a substantial amount of hazardous waste recycling activities taking place that are not currently being reported to, or regulated by, the province.

Similarly, while discharges to municipal sewer systems were calculated by the OWMC to be the largest single fate of hazardous wastes in the province,<sup>41</sup> the Ministry of the Environment is unable to provide estimates of the total amounts, composition or sources of these discharges, stating that it has no role in their monitoring.<sup>42</sup> The Ministry is also unable to provide estimates of total discharges of pollutants to Ontario's waterways from the 190 industrial facilities regulated under the Municipal-Industrial Strategy for Abatement (MISA) program.<sup>43</sup>

Very little information is available regarding waste pesticides, particularly from the agricultural sector. With respect to waste oil, it has been estimated that the fate of 75,000,000 litres of waste lubricating oil generated in Ontario is unaccounted for each year.<sup>44</sup> All of these activities are associated with potentially significant environmental impacts.

The Ministry of the Environmental has also provided a number of formal exemptions from the requirements of Part V of the *Environmental Protection Act* and Regulation 347, for such activities as the 'recycling' of hazardous and liquid industrial wastes, the on-site use of liquid industrial wastes as 'waste derived fuel,' the operation of collection depots for the collection of waste oil and related products, and empty pesticide containers, and the operation of refrigerant waste recycling and disposal sites. These have resulted in additional gaps in the available data. These are further compounded by the granting of informal 'administrative' exemptions for activities related to the recycling of lead-acid batteries,<sup>45</sup> and to permit the use of 'black liquor' from a pulp and paper mill as a dust suppressant.

In order to address these serious gaps in the information available to the province and the public, the province's monitoring and reporting requirements regarding the generation, handling and fate of hazardous and other 'subject' wastes require a complete overhaul and modernization.

## Recommendations

1. The Waste Generator Registration process should be revised to establish an annual reporting requirement. Under such a structure, all generators of 'subject' wastes should be required to file annual reports with the Ministry of the

Environment, on total subject waste, defined as non-product output of named substances or classes of substances, generated, its composition and its on- and off-site fate. The annual reports should also include information on substances in storage and non-production waste generation.

2. A publicly accessible registry of pesticide container, waste oil and other sites dealing with 'subject' wastes operating under exemptions from the general requirements of the province's waste management regulations should be established, along with requirements for regular reporting to the Ministry of the Environment regarding the quantities of materials received, stored at such sites, and their fates.

3. Industrial facilities regulated through the MISA program should be required to provide discharge monitoring data to the Ministry of the Environment in a standardized electronic format. This data should be made available to the public in a timely, easily accessible and user-friendly format.

4. The Ministry of the Environment should establish a requirement that municipalities provide annual reports to the Ministry regarding permitted and estimated total industrial discharges to their sewer systems. These reports should be made available to the public.

5. The Ministry of the Environment should establish a requirement that landfill operators report direct leachate discharges to municipal sewer systems to the Ministry. These reports should be made available to the public.

6. The Ministry of the Environment should establish a requirement that pesticide vendors report their sales of pesticides to the Province, including information on the types and quantities of pesticides sold, on a regular basis. Commercial applicators and municipalities should be required to report their use of pesticides on a similar basis. This information should be made available to the public.

7. The Ministry of the Environment should publish an annual report on the management of hazardous and other related wastes in the province of Ontario. This would include information on- and off-site management, discharges from MISA regulated industrial facilities, and industrial discharges to sewers. The data collected by the Ministry on the generation and fate of hazardous and other 'subject' wastes should also be made available to the public in a timely, comprehensive and user-friendly electronic format.

## THE REGULATORY FRAMEWORK FOR HAZARDOUS WASTE MANAGEMENT IN ONTARIO

The regulatory framework for the management of hazardous wastes in Ontario has been largely static since the current system's establishment in 1985. Ontario was once in the forefront in this area. However, its regulatory regime is now increasingly outdated in comparison to other jurisdictions. In addition, the gaps in the available data, and underlying regulatory system have been compounded by exemptions given to the handling of specific waste streams. As noted earlier, these include certain types of hazardous waste 'recycling' facilities, the on-site use of liquid industrial wastes as 'waste derived fuel,' the operation of collection depots for the collection of waste oil and related products, and empty pesticide containers, and the operation of refrigerant waste recycling and disposal sites.

In some cases, such as waste oil and pesticide collection depots and refrigerant recycling and disposal sites, operating standards apply as a condition of the exemption from the general requirements of Regulation 347.<sup>46</sup> However, these standards are often vague, and insufficiently specific to be enforceable. Operators are not even required to report the location of their facilities to the Ministry in some instances, and none are required to report regularly to the Ministry on the amounts of waste received, in storage, or its fate.

In addition, the statutory basis of the Ministry's 'administrative' exemptions from the 'subject' waste from the requirements of Part V of the *Environmental Protection Act* and Regulation 347 for lead-acid battery recycling, and the agreement with Domtar Ltd. to permit the use of 'black liquor' from its Trenton pulp and paper mill as a dust suppressant under the trade name 'Dombind' are open to serious question. Significant environmental concerns have been identified in relation to these activities.

## The Dombind Story

At many pulp and paper mills, wood and bark fragments plus, in some cases, recycled paper and cardboard are reduced to pulp and fibre by cooking them with chemicals. As the end of the process, the resulting "black liquor" contains a variety of tree-based and synthetic chemicals. The black liquor is then moved into evaporators, concentrated into a viscous liquid, and put in storage ponds where it may or not be diluted.

Most pulp and paper mills use their black liquor as fuel to generate heat needed for the cooking process. In 1995, stricter federal and provincial water pollution requirements under prompted Domtar Inc.'s Trenton mill to install a 'closed-loop' production system to eliminate its discharges of black liquor to the Trent River.

However, the plant continues to generate black liquor. Instead of being released into the River, it is now being marketed by Domtar as a dust suppressant called "Dombind" for use on unpaved rural roads. It is offered free to townships willing to collect it in their own trucks.

In 1993, the Ministry of the Environment gave Domtar's black liquor a temporary, 5 -year approval as a "product dust suppressant"

under the condition that the company analyze the product regularly for contaminants, conduct tests to determine if Dombind contaminants are accumulating on roadsides or poisoning fish, and investigate means of virtually eliminating dioxins and furans from their waste.

Test results indicate that the product has high levels of contaminants and very high toxicity even when diluted. Options for dealing with Black Liquor in a more environmentally responsible manner have been investigated, but none have been implemented. As a result, the World Wildlife Fund has asked the Ministry of the Environment not to renew its approval of Dombind as a dust suppressant.

In December 1998, the Ministry of the Environment Stated that it was giving Norampac (formerly Domtar) 30 days to develop a plan to phase out the use of Dombind within two years. As of March 1999, no action had been taken by the Ministry to implement this requirement.

**Adapted from:** World Wildlife Fund Canada, Action Alert: What is that Smelly Black Stuff on the Road?, July 1997.

More widely, the province lacks modern emission and operating standards for hazardous and liquid industrial waste incinerators, biomedical waste incinerators, facilities using 'subject' waste as fuel, or the direct release of hazardous substances to the atmosphere. No enforceable provincial standards exist at all for industrial discharges to municipal sewer systems, and no action has been taken to address a longstanding need for the imposition of restrictions on the land disposal of hazardous wastes.<sup>47</sup> In addition, the existing requirements of the *Pesticides Act* regarding the disposal of pesticide containers are widely recognized as being out of date, and no standards exist at all regarding the disposal of waste pesticides by agricultural users.

These gaps in the regulatory framework have been compounded by the dramatic reductions in the resources available to the Ministry of the Environment over the past three years. The Ministry's operating budget has declined by approximately 45% between the 1994-95 and 1998-99 fiscal years.<sup>48</sup> Specifically with respect to waste management, as of December 1996 it was reported that staffing levels had been reduced by more than 30%, measured against the 1994-95 fiscal year.<sup>49</sup> There has also been a marked decline in the environmental law enforcement efforts of the Ministry over the past



three years.<sup>50</sup>

The situation with respect to the completeness of the available data and the underlying regulatory framework is likely to be compounded by proposals for the reform of the province's waste management regulations presented by the Ministry of the Environment in July 1996,<sup>51</sup> and largely re-iterated by the Ministry in June 1998.<sup>52</sup>

Among other things, the province's proposals would:

- eliminate certificate of approval requirements for the on-site handling, 'temporary' storage and processing of 'subject' wastes, including wastes brought in from off-site sources and PCB wastes; 'field operations' involving the handling of hazardous wastes; and the disposal of 'subject' wastes as dust suppressants;
- remove current fire and spill protection, site security, staff training and other requirements for 'selected' waste depots;
- confirm the expansion of the 'recycling' exemption to include such specific substances as 'chop line' residue, silver bearing photochemical wastes, and the use of waste 'pickle liquor' in municipal sewage treatment plants;<sup>53</sup>
- exempt waste batteries, precious metal bearing waste, and certain types of mercury containing waste from waste generation registration and manifesting requirements; and
- permit the disposal of untreated blood from hospitals and funeral homes into municipal sewer systems and the disposal of 'treated biomedical waste' in sanitary landfills.<sup>54</sup>

The Ministry proposals have been presented as being intended to reduce costs to industry, and to promote the 'recycling' and other forms of diversion of hazardous wastes from disposal. The Ministry has also been offering regulatory concessions to specific sectors or even individual firms, in exchange for voluntary commitments to reduce emissions of pollutants.<sup>55</sup>

This approach entails significant risks to the environment, human health and public safety. This is especially apparent in light of the July 1997 Plastimet Inc. fire and the subsequent report of the Office of the Fire Marshal, recommending that environmental and fire safety standards for recycling and waste handling facilities be significantly strengthened.<sup>56</sup>

The Ministry's proposals would also remove opportunities for public participation in decision-making on waste handling and disposal activities, compound the existing gaps in the available data regarding the management of hazardous and other 'subject' wastes in the province, while offering no apparent environmental benefit.<sup>57</sup>

In addition to its proposed revisions to its waste management regulations, the Ministry of the Environment has proposed to remove the monitoring and reporting

requirements under the MISA industrial water pollution control regulations.<sup>58</sup> It has also proposed to weaken its model Municipal Sewer Use By-Law, including the removal of specific prohibitions on the disposal of certain types of hazardous wastes in sanitary and storm sewers.<sup>59</sup>

The Ministry's proposals fail to address the gaps in the existing regulatory framework for waste management identified by the Office of the Fire Marshal, the Provincial Auditor and others. Rather they move in the opposite direction of the Environmental Commissioner of Ontario's conclusion that:

"Ontario's focus needs to change from one of granting regulatory relief to polluters to improving its commitments to the health of its residents and the natural environment."<sup>60</sup>

A fundamentally different approach to the management of hazardous wastes is than that currently being taken by the Ontario government is required to ensure a safe and environmentally sustainable future for present and future residents of the province. This must address the information and regulatory gaps in the existing system, and place an increased emphasis on waste reduction and pollution prevention at source. Although significant gaps exist in the available data, sufficient information has been generated through the OWMC Environmental Assessment process and other sources to indicate that there are substantial weaknesses in the current regulatory framework which require immediate attention.

## Recommendations

8. The Ministry of the Environment's regulatory oversight of hazardous and liquid industrial waste 'recycling' and 'processing' activities should be strengthened. Specifically, the existing exemption for such activities from the requirements of Part V of the *Environmental Protection Act* (EPA) and Regulation 347 should be reviewed and consideration given to its withdrawal;

9. Stringent approval, emission and operating regulatory standards for biomedical, liquid industrial and hazardous waste incinerators, and facilities using 'subject' waste as fuel, should be developed and adopted by the Ministry of the Environment.

10. The Ministry of the Environment should establish pre-treatment standards for industrial discharges to sewers, as proposed in the original MISA program,<sup>61</sup> and establish of pre-treatment requirements for landfill leachate discharges or transfers to municipal sewage treatment plants.

11. Restrictions on the land disposal of hazardous wastes should be imposed by the Ministry of the Environment, beginning with a ban on the land disposal of liquid organic wastes.

12. The use of hazardous or other 'subject' wastes as dust suppressants should be phased-out.

13. The Ministry of the Environment should adopt a permanent prohibition of the use of waste oil as fuel in small space heating furnaces.<sup>62</sup>

14. A modernized definition of biomedical wastes should be adopted by the province. This should not permit the disposal of untreated blood or bodily fluids in sanitary sewers or septic systems.

15. All waste pesticides should be included in the province's definition of hazardous wastes.

### **Hazardous Materials vs. Hazardous Wastes**

In the longer term, there is a need at the federal and provincial levels to consider a shift from regulation of hazardous 'wastes' to regulation of hazardous 'materials.' Such an approach has the advantage of avoiding the debates about whether hazardous 'recyclable' materials should be removed from the definition of hazardous wastes.

A hazardous materials approach would also have the advantage of capturing the use and handling of hazardous substances, activities which may pose many of the same environmental and health problems as the handling of hazardous wastes. In addition, such an approach would open possibilities for the integration of environmental and occupational health and safety standards in the handling of hazardous materials.

### **Recommendation:**

16. The province should move towards the establishment of policy and regulatory system that controls the generation, use, handling and disposal of materials on the basis of their hazardous properties, regardless of whether they are a 'product,' 'recyclable material' or 'waste.'

### **Household Hazardous Wastes**

Household hazardous waste (HHW) is the residual of products used in the home which are toxic, combustible, explosive, and/or flammable.<sup>63</sup> This includes such materials as waste paints, solvents, pesticides, used motor oil, fuels, batteries and chemicals. HHW is estimated to constitute approximately 2% of the total hazardous waste stream.<sup>64</sup> However, it poses significant environmental and human health threats. In addition to the immediate dangers associated with its handling and storage in the home, HHW has been implicated as a significant source of the toxic components of landfill leachate.

Published estimates of the total amount of HHW generated in Ontario annually range from 20,000<sup>65</sup> to 86,000 tonnes/yr.<sup>66</sup> A detailed study of the composition of the Ontario HHW stream was completed by the Association of Municipal Recycling Coordinators (AMRC) is presented in **Table 10**.

**Table 10: Ontario HHW Stream Composition (Six Municipalities - 1996)**

HHW Category	Percent of Overall Composition	Top 3 Product Types	Top 3 Brand Owners
Paint	40.7%	Latex Paint Alkyd Paint Enamel Paint	Colour Your World (18.7%) St.Clair (12.4%) Sears (8.2%)
Flammables <sup>oo</sup>	22.4%	Unknown Stain Cleaners	Unknown (23.6%) Canadian Tire (9.2%) Beaver Lumber (4.5%)
Oils	17.1%	Motor Oil Oil Filters	Unknown (54%) Canadian Tire (21%) Quaker State (12.6%)
Vehicle Batteries	11.4%	N/A	Canadian Tire (30.1%) unknown (24.9%) AC Delco (16.9%)
Gas Cylinders	4.5%	Large Propane Small Propane Other	<u>Large Propane</u> unknown (51.5%) Wolfdale Engineering (31.9%) Engineering Products (6.5%) <u>Small Propane</u> Coleman Canada (42.3%) Canadian Tire (30.1%) Unknown (9.3%)
Bases	1.0%	Other Cleaners Wax Strippers	Canadian Gypsum (32.3%) unknown (12.0%) Domtar Gypsum (7.2%)
Antifreeze	1.6%	N/A	unknown (47.8%) Canadian Tire (30.7%) First Brands (6.5%)
Pesticides	0.5%	Insecticide Herbicide Other	Unknown (16.2%) S.C. Johnson Wax (11.6%) CIBA-Geigy (9.2%)
Oxidizers	0.5%	Fertilizer Pool Chemicals Disinfectant	Co-op (14.4%) Unknown (12.4%) Olin Corporation (10.9%)
Acids	0.3%	Muriatic Acid Other Cleaners	unknown (22.6%) Sheffield Bronze Power (9.8%) Ecolab (5.9%)
Pharmaceuticals	0.1%	Prescription & non-prescription medication, unknown	N/A
Household Batteries	0.0%	Alkaline, Button Nickel-Cadmium	Not recorded.

<sup>oo</sup> (includes stains, cleaners, driveway sealers, fuel, rust/metal paint, adhesive, paint remover/thinner, liquid plastic).

The elimination of provincial funding for all municipal HHW programs was announced in November 1995. There are currently no requirements in Ontario that firms make arrangements for the collection and disposal of products which may become HHW. This is in contrast to the approach taken in many other provinces, most notably British Columbia.<sup>67</sup>

In June 1998, the Ministry proposed to establish a "standardized approval" system for depots that would collect HHW from the public, including batteries, domestic pesticides, agricultural and commercial pesticides, mercury containing lamps, light switches thermometers and thermostats, paints, pharmaceuticals, and propane.<sup>68</sup>

A "standardized" approval system would allow such facilities to operate without a Certificate of Approval from the Ministry of the Environment, provided that they met certain conditions prescribed by the Ministry. The Ministry's proposals have been subject to substantial criticism due to the failure to articulate criteria for the application of standardized approvals, the inadequacy of the proposed standards, lack of an enforcement plan, the loss of public notice and comment opportunities under the *Environmental Bill of Rights*, and their implications for the common law rights of persons who may be adversely affected by activities approved through standardized approvals.<sup>69</sup>

## Recommendations

17. The Ministry of the Environment should establish specific requirements regarding the operation of sites which collect HHW from the public which are not subject to full certificate of approval requirements.<sup>70</sup> These requirements should address:

- staff training, with particular emphasis on regulatory requirements, occupational health and safety, and fire and spill prevention and response;
- storage limits and requirements related to storage practices;
- facility location;
- provision of notice of intent to establish facilities to the Ministry of the Environment, and acknowledgement by the Ministry prior to the commencement of operations;
- confirmation of fire protection requirements prior to the commencement of operations;
- regular reporting requirements, and public access to reports; and
- the reporting of the location and ownership of operating sites through the public registry proposed in Recommendation 2.

18. The Province should move towards the establishment of life-cycle producer responsibility for the collection, recycling and disposal of products which may become household hazardous wastes, including waste oil, paint, pesticides, fuels, batteries and solvents. The establishment of deposit/refund and return to retailer requirements should be considered for products for which producer responsibility arrangements are not made by manufacturers or retailers.

## WASTE REDUCTION AND POLLUTION PREVENTION

The environmental impacts associated with virtually all of the fates of hazardous wastes, once they have been generated, stress the need for the province's policy and regulatory framework for the management of such wastes to emphasize their reduction at source, through pollution prevention measures.

Currently, the province of Ontario is relying almost entirely on voluntary action by industry to reduce the generation of hazardous wastes. The promotion of such action has been presented as a major element of the province's rationale for its proposals to weaken the regulatory framework for the management of 'subject' wastes, and to reduce the monitoring and reporting requirements applicable to industry.

As the Plastimet fire and subsequent report of the Office of the Fire Marshal<sup>71</sup> highlighted, this approach poses significant risks to public safety and environmental quality. It also contradicts a wide body of literature and empirical evidence identifying stringent and certain regulatory demands, supported by expectations of enforcement, as the major drivers for the development of new environmental technologies and skills.<sup>72</sup>

### Pollution Prevention Planning

In the United States, the federal government and many states have adopted legislation to link reporting activities under the Toxic Release Inventory<sup>73</sup> to requirements that waste generating facilities undertake pollution prevention planning programs. 'The materials accounting' model employed in legislation adopted in Massachusetts and New Jersey, for example, has resulted in significant reductions in the use of toxic chemicals and the generation of hazardous wastes, as well as substantial cost savings to the affected industries.<sup>74</sup> By contrast, the current pollution prevention planning program sponsored by the province is of a voluntary nature, and has only engaged approximately 200 participating facilities, many of which are not significant industrial waste generators.<sup>75</sup>

## TOXICS USE REDUCTION IN MASSACHUSETTS

In 1989 the Massachusetts legislature enacted *Toxics Use Reduction Act*. The Act sets a goal of a 50% reduction by 1997, measured against a 1987 base year, in the quantity of toxic and hazardous wastes generated by Massachusetts industries. Under the Act, approximately 600 firms which qualify as "Large Quantity Toxics Users" must report annually to the state Department of Environmental Protection on their use of toxics and generation of toxic by-products. These firms are defined as employing ten or more full-time workers, and qualifying to report under the federal TRI requirements.<sup>76</sup>

By-products are defined by the Act as "all non-product outputs of toxic or hazardous substances generated by a production unit, prior to handling, transfer, treatment or release."<sup>77</sup> Consequently, a by-product includes materials that are recycled, reused or reprocessed on site, but outside of the production process in which it is generated, as well as materials released to the air and water or transferred off-site.<sup>78</sup>

Affected firms are required to establish a facility toxics use reduction team, which prepares a toxics use reduction plan. The team evaluates the facility for toxics use and by-product generation, identifies toxics use reduction options, and evaluates the options based on technical and economic feasibility as well as environmental, health and safety impacts. The plan must be certified by a Department of the Environment-certified toxics use reduction planner. However, The Act does not require that a facility implement any toxics use reductions, or to achieve any specific reduction goals. It only requires that a facility have a plan.<sup>79</sup>

The program is integrated with federal TRI reporting requirements, and is financed through an annual fee charged on the use of chemicals for which the planning requirements apply. A Toxics Use Reduction Institute has been established at the University of Massachusetts Lowell, to provide training for toxics use reduction planners, and conduct research on toxics use reduction technologies.<sup>80</sup>

An evaluation of the program completed in March 1997 concluded that between 1990 and 1995, it had resulted in a drop in chemical use of 20% and by-product generation of 30%.<sup>81</sup> The total costs of implementing the program were identified as \$77 million, while monetized benefits were placed at \$91 million. This does not include benefits to human health or the environment.<sup>82</sup>

## Recommendation

19. Ontario should enact a *Pollution Prevention Planning Act*. This should be based on the Massachusetts and New Jersey models of "materials accounting" and planning, and be integrated with the revised waste generator registration and reporting requirements proposed in Recommendation 1.

## Persistent Toxic and other Substances of Concern

Persistent, bioaccumulative toxic substances present a well-recognized threat to the environment and human health. This was reflected in the 1978 renewal of the 1972 *Great Lakes Water Quality Agreement* between Canada and the United States. Among other things, the Agreement committed the Parties to the "virtual elimination" of the input of persistent toxic substances into the Great Lakes System, stating that the "philosophy adopted for control of inputs of persistent toxic substances shall be zero discharge."<sup>83</sup>

In its 1990 5th biennial report under the Agreement, the International Joint Commission, the Binational body mandated with overseeing the implementation of the Agreement, stated that:

"We have concluded from wildlife and laboratory animal information that persistent toxic substances in the Great Lakes Basin Ecosystem pose serious risks to living organisms...

Together with available human data, the information leads us to the conclusion that persistent toxic substances in the Great Lakes environment also threaten human health."<sup>84</sup>

These conclusions lead the Commission to recommend that the Parties:

"take every available action to stop the inflow of persistent toxic substances into the Great Lakes environment."<sup>85</sup>

This direction has been reiterated in the Commission's 6th,<sup>86</sup> 7th,<sup>87</sup> 8th<sup>88</sup> and 9th<sup>89</sup> biennial reports under the Agreement. The Commission has also expressed growing concern over the failure the Parties to act on their commitment to the "virtual elimination" of persistent toxic substances from the Great Lakes ecosystem in each report.

In its September 1992 report the Ontario Round Table on the Environment and Economy similarly recommended that the government of Ontario "end the release of persistent bioaccumulative toxic substances by the year 2000."<sup>90</sup>

The elimination of the release of designated substances, or "zero discharge" was defined in 1991 by a Virtual Elimination Task Force, established by the IJC, as the



elimination of all inputs to the ecosystem of persistent toxic substances produced, used, distributed, or disposed of in or around the basin, whether from direct release into waterways or the atmosphere, indirect releases such as agricultural and urban runoff, or inadvertent releases such as spills.<sup>91</sup> In its 1993 final report, the Task Force stated that the zero discharge philosophy implies adopting measures to eliminate any use or synthesis of a substance.<sup>92</sup>

In response to these efforts, in April 1992, the Ministry of the Environment published a report entitled Candidate Substances List for Bans or Phase-Outs, identifying substances to be consider for banning, phasing out or use/release reductions. The original report focused on persistent toxic substances of concern from a surface water perspective. A multi-media version of the report was released in October 1993.<sup>93</sup> The resulting primary list contained 27 substances or substance groups, and the secondary list 63 substances.

Unfortunately, little progress was made on action on the list before June 1995, and efforts to address the substances appear to have halted completely after that date. There was, for example, no evidence of movement towards phase-out or significant reductions in releases of the candidate substances in proposed revisions to air pollution standards presented by the Ministry of the Environment in March 1998.<sup>94</sup>

In addition to the long-standing body of evidence regarding the environmental and human health impacts of persistent toxic substances, other classes of substances have recently emerged as being of high concern. Among the most significant of these have been endocrine disrupting chemicals. These are synthetic chemicals that can mimic, block, and/or interfere with functions of naturally produced female and male hormones in the body, thereby interfering with an organism's development and reproduction. These effects can occur as a result of exposure to extremely low levels of such substances at important stages of fetal or infant development.<sup>95</sup>

## **Recommendation**

20. The substances on the primary candidates substances list should be targeted for virtual elimination in the revision and modernization of the province's standards for hazardous air pollutants.

21. The substances on the primary candidate substances list should be targeted for virtual elimination in review of other standards, including industrial and municipal water pollution control standards under the MISA program and the Model-Sewer-Use By-Law.

22. Reductions in the use and generation of substances on the primary and secondary candidate substances lists should be sought through the pollution prevention planning program proposed in Recommendation 18.

23. The Ministry of the environment should review all of its existing standards to consider the potential impacts of endocrine disrupting substances.

## **Hazardous Waste Charges**

A number of U.S. states, and many jurisdictions in Western Europe have applied substantial charges or taxes to the generation of hazardous wastes. These are intended to provide incentives for waste reduction and, in some cases, provide revenues for the operation of hazardous waste programs. The Ministry of the Environment has proposed the application of a similar charge, for cost recovery purposes to waste generators in Ontario.<sup>96</sup>

The application of such a charge should be strongly supported in principle. However, serious concerns exist regarding the long-term implications of the core regulatory functions of the Ministry of the Environment becoming dependent for resources upon the very activities which they are intended to oversee. These are basic governmental responsibilities related to the protection of public goods, and should be supported through general government revenues. However, this problem may be avoided by employing the revenues realized through such a charge to support non-regulatory functions, and using the resources released in this way to strengthen the core regulatory capacity of the Ministry.

### **Recommendation**

24. The Ministry of the Environment should implement a charge on the generation of hazardous wastes on a per tonne basis. The revenues obtained through such a charge should be used to support programs and activities related to hazardous wastes and substances including the remediation of 'orphan' contaminated sites, maintenance of spills and other emergency response capacity, pollution prevention planning programs, and hazardous waste reduction technology and skills development and diffusion.

25. The revenues released through the support of these programs through the application of a hazardous waste charge proposed in Recommendation 23 should be reallocated to the basic regulatory functions of the Ministry related to hazardous and other 'subject' wastes, such as approvals, monitoring, enforcement, and public reporting.

## **TREATMENT AND DISPOSAL FACILITIES**

In its 1994 decision regarding the Ontario Waste Management Corporation, the Environmental Assessment Board identified a substantial need for additional hazardous waste treatment and disposal capacity in Ontario. The Board highlighted the absence of a treater of last resort in the province, and the increasing dominance of the off-site treatment and disposal services sector by a very small number of firms.<sup>97</sup> These problems continue to exist. The province also remains vulnerable to border closings with respect to exports of wastes for which treatment and disposal capacity does not exist in Ontario, such as biomedical wastes requiring incineration.

In addition, no method of disposal exists for some elements of the hazardous waste stream. CFC's are a particularly significant problem in this regard. The Ministry of the Environment has estimated that the phase-out of CFC's will eventually require the treatment of 40,000 tonnes of the chemicals.<sup>98</sup> No method currently exists for the destruction of these substances.<sup>99</sup>

Given the potential environmental and human health impacts of hazardous waste treatment and disposal facilities, it is critical that adequate reviews of proposed facilities occur before they are established. It is also important that new disposal capacity not be approved in isolation from an overall provincial strategy to reduce the generation of hazardous wastes. The availability of low cost disposal facilities may undermine both the use of more environmentally sound destruction and disposal options, and efforts to encourage hazardous waste reduction through the application of pollution prevention skills and technologies.

Within this context, serious concerns have been raised regarding the approach taken by the Ministry of the Environment's to recent approvals of new permanent hazardous waste treatment and disposal facilities. In September 1997, for example, a 15-20 year expansion of the province's only hazardous waste landfill, the Laidlaw Environmental Service's facility Sarnia, was approved without a public hearing before the Environmental Assessment Board.<sup>100</sup>

In addition, in December 1997 the use of a scrap metal smelting furnace as a permanent low-level PCB disposal facility, operated by Gary Steacy Dismantling Ltd was approved. In its decision regarding the facility, the Board questioned why the proposal had not been designated for review under the *Environmental Assessment Act*, particularly given its implications for the use of commercially available, mobile, non-incineration PCB destruction technologies in the province. The Board also noted the absence of public interest intervenors able to challenge evidence brought forward by the proponent in the hearing regarding the likely environmental and health impacts of the facility, due to the lack of intervenor funding.<sup>101</sup>

These events highlight the impact of the expiry of the *Intervenor Funding Project Act* in April 1996, and the erosion of approval requirements related to hazardous waste handling, treatment and disposal facilities over the past few years. These developments have significantly weakened the level of external oversight and accountability related to the establishment of such facilities.

## Recommendations

26. A regulation should be adopted under the *Environmental Assessment Act* designating all proposals for permanent hazardous and other 'subject' waste disposal facilities for review under the Act.

27. The *Environmental Protection Act* should be amended to require public hearings before the Environmental Assessment Board under the prior to the approval of hazardous waste handling or disposal systems or sites.

28. Provision should be made for intervenor funding to *bona fide* public interest intervenors in such hearings.

## CONTAMINATED SITES

The improper management of hazardous wastes in the past has left a significant legacy in form of contaminated sites in Ontario and across Canada. Such sites cannot be put to new uses until they are remediated and, in some cases, pose direct threats to ground and surface waters, and the health of human beings living near them. The remediation of such sites is often expensive, and results in the generation of significant quantities of hazardous wastes which themselves require disposal.<sup>102</sup> The remediation of a former PCB transfer station in Smithville, Ontario for example has cost more than \$50 million to date.<sup>103</sup>

There is no complete inventory of contaminated sites in Ontario or Canada as a whole, or reliable estimate of the number of sites which exist. The Auditor-General of Canada has estimated that there are at least 5,000 contaminated sites on federal lands alone,<sup>104</sup> with a potential clean-up cost of up more than \$2 billion.<sup>105</sup> Estimates of the total cost of remediating all sites across Canada, based on experience in the U.S. and elsewhere, range from \$20 to \$75 billion, excluding sites contaminated with radioactive materials.<sup>106</sup>

The province's approach to this problem over past few years has been confused. In some cases, Ministry has aggressively sought to impose liability for clean-up on past and present owners and occupiers of contaminated sites.<sup>107</sup> In absence of remediation fund for sites for which the responsible party no longer exists, or cannot be identified, this has been seen as the only way to avoid public having to fund site clean-ups.

However, there is considerable anecdotal evidence that this practice has had the effect of discouraging the redevelopment of potentially contaminated sites. This has been particularly true with respect to former industrial lands in urban areas. The redevelopment of such lands is widely seen as being desirable from the perspectives of urban renewal, and as an alternative to urban sprawl.<sup>108</sup>

The Ministry of the Environment's response to these concerns to date has been to grant exemptions from liability for site remediation to particular sectors, such as financial institutions,<sup>109</sup> and to effectively lower the standards required for clean-up. New contaminated site remediation guideless adopted in July 1996, for example, permit the use of site specific 'risk based' standards for site remediation.<sup>110</sup> These allow the remediation of sites to a level that is less rigorous than the standard of restoration to background levels of contamination required in the Ministry's original 1989 guidelines.

A number of stakeholders, including environmental organizations, have argued over the past few years that the Ministry needs to follow the approach being taken by a number of other provinces, such as British Columbia,<sup>111</sup> and adopt an comprehensive approach to this problem. This would deal with the issues of clean-up standards, the

funding of orphan site remediation, the assignment of liability, and the establishment of a publicly accessible registry of contaminated sites in the province, in an integrated manner.<sup>112</sup>

## **Recommendations**

29. The Ministry of the Environment should adopt a policy on the allocation of liability for the costs of site remediation, reflecting the following principles articulated for the Law Reform Commission on Canada in 1990:

- the protection of public health and welfare and the environment;
- the orderly, efficient and effective remediation of environmental degradation;
- the prevention and deterrence of future contamination;
- the promotion of compliance and self-regulation;
- provision of incentives for environmental protection;
- requirement that polluters pay in order to protect the public purse;
- the equitable imposition and allocation of liabilities;
- the avoidance of unjust enrichment or deprivation;
- clarity and precision in defining responsibilities; and
- sufficient flexibility and discretion to allow regulators to address a wide range of situations.<sup>113</sup>

30. Following the model of many U.S. states,<sup>114</sup> the province should establish an orphan site remediation fund. This should be supported through the allocation of some of the revenues from the hazardous waste charge which is proposed in Recommendation 23.

31. The Ministry of the Environment should review its approach to standard setting for contaminated sites. In particular, sites remediated on the basis of the 'site-specific, risk-based' model should not be permitted to be redeveloped for housing purposes. Prohibitions on other uses of lands remediated to 'risk-based' standards through which particularly vulnerable populations, such as children, might come into contact with contaminated soil, should also be considered. This would include such uses as schools and playgrounds.

32. Following the model of British Columbia and other provinces, the Ministry of the Environment should establish a publicly accessible registry of contaminated sites in the province. This should be accompanied by the establishment of clear rules requiring registration of histories of site contamination, and the clean-up measures undertaken, on title to land.

## **STRENGTHENING GOVERNMENT AND INDUSTRY ACCOUNTABILITY IN HAZARDOUS WASTE MANAGEMENT**

The Ministry of the Environment proposed wide ranging alterations to the

regulatory framework for the management of hazardous wastes in the province in July 1996, and indicated its intention to proceed with the bulk of these changes in June 1998, under the auspices of its regulatory review process.<sup>115</sup> These proposals were presented with little or no supporting documentation or evidence regarding the need for change, or the likely impact of the proposed changes on public safety and environmental protection.

These developments, and the recent approvals of new permanent hazardous waste disposal facilities in the province, highlight the need for enhanced accountability structures regarding the Ministry's regulation of the management of hazardous wastes. This requirement is particularly acute in light of the elimination of most of the Ministry of the Environment's external advisory committees over the past two years.<sup>116</sup>

## **Recommendation**

33. An independent advisory committee regarding hazardous waste management should be established to provide independent advice, and review Ministry proposals on issues related to the management of hazardous wastes.

In the longer term, a number of broader steps could be taken to both improve the environmental accountability of the government and strengthen the information base available for public policy decision-making. These should include a commitment to providing regular state of the environment reports to the public. In addition, the practice of providing annual reports regarding environmental law enforcement activities by the Ministry, terminated in 1995, should be restored.

## **CONCLUSIONS**

Over the past four years, the Province of Ontario has experienced a significant growth in the generation of hazardous wastes from Ontario sources. The total quantities of waste manifested for off-site treatment and disposal in Ontario has risen from 1.5 million tonnes in 1994, to 2.1 million tonnes in 1997. The rate of growth in manifested waste quantities exceeds the rate of growth for the provincial in the same period by a factor of more than three to one.

The province is also experiencing a dramatic increase in international imports of hazardous wastes for 'recycling' and disposal, rising from 56,439 tonnes in 1993 to 246,000 tonnes in 1997. Ontario's International hazardous waste traffic is almost exclusively with the United States. This growth in waste imports may be a result of the strengthening of regulatory controls on the disposal of hazardous wastes in the United States, while the regulatory regime in Ontario has remained static or, in some cases, been weakened.

These trends indicate that the province's regulatory and information systems for hazardous wastes requires a thorough overhaul and modernization. This is necessary to provide an adequate information base for public policy decision-making, ensure the

accountability of industry and government, protect the public's safety, health and environment, and promote pollution prevention and hazardous waste reduction. The changes that have been proposed will require several years to implement, and necessitate substantial investments of resources. However, these measures are necessary to ensure a safe and environmentally sustainable future for present and future generations of Ontarians.

## SUMMARY OF RECOMMENDATIONS

1. The Waste Generator Registration process should be revised to establish an annual reporting requirement. Under such a structure, all generators of 'subject' wastes should be required to file annual reports with the Ministry of the Environment, on total subject waste, defined as non-product output of named substances or classes of substances, generated, its composition and its on- and off-site fate. The annual reports should also include information on substances in storage and non-production waste generation.
2. A publicly accessible registry of pesticide container, waste oil and other sites dealing with 'subject' wastes operating under exemptions from the general requirements of the province's waste management regulations should be established, along with requirements for regular reporting to the Ministry of the Environment regarding the quantities of materials received, stored at such sites, and their fates.
3. Industrial facilities regulated through the MISA program should be required to provide discharge monitoring data to the Ministry of the Environment in a standardized electronic format. This data should be made available to the public in a timely, easily accessible and user-friendly format.
4. The Ministry of the Environment should establish a requirement that municipalities provide annual reports to the Ministry regarding permitted and estimated total industrial discharges to their sewer systems. These reports should be made available to the public.
5. The Ministry of the Environment should establish a requirement that landfill operators report direct leachate discharges to municipal sewer systems to the Ministry. These reports should be made available to the public.
6. The Ministry of the Environment should establish a requirement that pesticide vendors report their sales of pesticides to the Province, including information on the types and quantities of pesticides sold, on a regular basis. Commercial applicators and municipalities should be required to report their use of pesticides on a similar basis. This information should be made available to the public.
7. The Ministry of the Environment should publish an annual report on the management of hazardous and other related wastes in the province of Ontario. This would include information on- and off-site management, discharges from MISA regulated industrial facilities, and industrial discharges to sewers. The data collected by the Ministry on the generation and fate of hazardous and other 'subject' wastes should also be made available to the public in a timely, comprehensive and user-friendly electronic format.
8. The Ministry of the Environment's regulatory oversight of hazardous and liquid industrial waste 'recycling' and 'processing' activities should be strengthened. Specifically, the existing exemption for such activities from the requirements of Part



V of the *Environmental Protection Act* (EPA) and Regulation 347 should be reviewed and consideration given to its withdrawal;

9. Stringent approval, emission and operating regulatory standards for biomedical, liquid industrial and hazardous waste incinerators, and facilities using 'subject' waste as fuel, should be developed and adopted by the Ministry of the Environment.
10. The Ministry of the Environment should establish pre-treatment standards for industrial discharges to sewers, as proposed in the original MISA program, and establish of pre-treatment requirements for landfill leachate discharges or transfers to municipal sewage treatment plants.
11. Restrictions on the land disposal of hazardous wastes should be imposed by the Ministry of the Environment, beginning with a ban on the land disposal of liquid organic wastes.
12. The use of hazardous or other 'subject' wastes as dust suppressants should be phased-out.
13. The Ministry of the Environment should adopt a permanent prohibition of the use of waste oil as fuel in small space heating furnaces.
14. A modernized definition of biomedical wastes should be adopted by the province. This should not permit the disposal of untreated blood or bodily fluids in sanitary sewers or septic systems.
15. All waste pesticides should be included in the province's definition of hazardous wastes.
16. The province should move towards the establishment of policy and regulatory system that controls the generation, use, handling and disposal of materials on the basis of their hazardous properties, regardless of whether they are a 'product,' 'recyclable material' or 'waste.'
17. The Ministry of the Environment should establish specific requirements regarding the operation of sites which collect HHW from the public which are not subject to full certificate of approval requirements. These requirements should address:
  - staff training, with particular emphasis on regulatory requirements, occupational health and safety, and fire and spill prevention and response;
  - storage limits and requirements related to storage practices;
  - facility location;
  - provision of notice of intent to establish facilities to the Ministry of the Environment, and acknowledgement by the Ministry prior to the commencement of operations;
  - confirmation of fire protection requirements prior to the commencement of operations;
  - regular reporting requirements, and public access to reports; and

- the reporting of the location and ownership of operating sites through the public registry proposed in Recommendation 2.
18. The Province should move towards the establishment of life-cycle producer responsibility for the collection, recycling and disposal of products which may become household hazardous wastes, including waste oil, paint, pesticides, fuels, batteries and solvents. The establishment of deposit/refund and return to retailer requirements should be considered for products for which producer responsibility arrangements are not made by manufacturers or retailers.
  19. Ontario should enact a *Pollution Prevention Planning Act*. This should be based on the Massachusetts and New Jersey models of "materials accounting" and planning, and be integrated with the revised waste generator registration and reporting requirements proposed in Recommendation 1.
  20. The substances on the primary candidates substances list should be targeted for virtual elimination in the revision and modernization of the province's standards for hazardous air pollutants.
  21. The substances on the primary candidate substances list should be targeted for virtual elimination in review of other standards, including industrial and municipal water pollution control standards under the MISA program and the Model-Sewer-Use By-Law.
  22. Reductions in the use and generation of substances on the primary and secondary candidate substances lists should be sought through the pollution prevention planning program proposed in Recommendation 20.
  23. The Ministry of the environment should review all of its existing standards to consider the potential impacts of endocrine disrupting substances.
  24. The Ministry of the Environment should implement a charge on the generation of hazardous wastes on a per tonne basis. The revenues obtained through such a charge should be used to support programs and activities related to hazardous wastes and substances including the remediation of 'orphan' contaminated sites, maintenance of spills and other emergency response capacity, pollution prevention planning programs, and hazardous waste reduction technology and skills development and diffusion.
  25. The revenues released through the support of these programs through the application of a hazardous waste charge proposed in Recommendation 23 should be reallocated to the basic regulatory functions of the Ministry related to hazardous and other 'subject' wastes, such as approvals, monitoring, enforcement, and public reporting.
  26. A regulation should be adopted under the *Environmental Assessment Act* designating all proposals for permanent hazardous and other 'subject' waste disposal

facilities for review under the Act.

27. The *Environmental Protection Act* should be amended to require public hearings before the Environmental Assessment Board under the prior to the approval of hazardous waste handling or disposal systems or sites.
28. Provision should be made for intervenor funding to *bona fide* public interest intervenors in such hearings.
29. The Ministry of the Environment should adopt a policy on the allocation of liability for the costs of site remediation, reflecting the following principles articulated for the Law Reform Commission on Canada in 1990:
  - the protection of public health and welfare and the environment;
  - the orderly, efficient and effective remediation of environmental degradation;
  - the prevention and deterrence of future contamination;
  - the promotion of compliance and self-regulation;
  - provision of incentives for environmental protection;
  - requirement that polluters pay in order to protect the public purse;
  - the equitable imposition and allocation of liabilities;
  - the avoidance of unjust enrichment or deprivation;
  - clarity and precision in defining responsibilities; and
  - sufficient flexibility and discretion to allow regulators to address a wide range of situations.<sup>117</sup>
30. Following the model of many U.S. states,<sup>118</sup> the province should establish an orphan site remediation fund. This should be supported through the allocation of some of the revenues from the hazardous waste charge which is proposed in Recommendation 25.
31. The Ministry of the Environment should review its approach to standard setting for contaminated sites. In particular, sites remediated on the basis of the 'site-specific, risk-based' model should not be permitted to be redeveloped for housing purposes. Prohibitions on other uses of lands remediated to 'risk-based' standards through which particularly vulnerable populations, such as children, might come into contact with contaminated soil, should also be considered. This would include such uses as schools and playgrounds.
32. Following the model of British Columbia and other provinces, the Ministry of the Environment should establish a publicly accessible registry of contaminated sites in the province. This should be accompanied by the establishment of clear rules requiring registration of histories of site contamination, and the clean-up measures undertaken, on title to land.
33. An independant advisory committee regarding hazardous waste management should be established to provide independent advice, and review Ministry proposals on issues related to the management of hazardous wastes.

## ENDNOTES

- 1.Environmental Commissioner for Ontario, Annual Report 1997 (Toronto: ECO, 1998), pg.4.
- 2.Apogee Research, The Canadian Hazardous Waste Inventory (Ottawa: Environment Canada, 1995).
- 3.Joint Board, Ontario Waste Management Corporation Application: Decision and Reasons for Decision Ch-87-01, November 23, 1994, Table 1. The OWMC estimated total generation of all subject waste, including liquid industrial waste at 5.4 million tonnes/yr. An estimate of between 4-5 million tonnes/yr may be projected from the total of 2.1 million tonnes reported disposed of off-site in 1997 through the province's waste manifest system.
- 4.Environment Canada, The State of Canada's Environment (Ottawa: Minister of Supply and Services, 1991), pg.14-12.
- 5.Office of the Provincial Auditor, 1996 Annual Report (Toronto: Queen's Printer for Ontario, 1996), pg.120.
- 6.1996 Annual Report of the Office of the Provincial Auditor of Ontario, (Toronto: Queen's Printer for Ontario, 1996), pp.119-121.
- 7.Joint Board, OWMC Decision, pg.3-4, and note 12.
- 8.Joint Board, OWMC Decision, ch.3.
- 9.See, for example, B.McAndrew, "Recycle plant charged with toxic dumping," The Toronto Star, August 25, 1997.
- 10.S.D. Porteous/Solicitor-General Canada Organized Crime Impact Study: Highlights (Ottawa: Public Works and Government Services Canada, 1998), pg.ii.
- 11.Under this system, established in 1985, generators of 'subject' waste are required to register with the Ministry of the environment. However, they are not required to provide regular updates on their waste generation after initial registration.
- 12.Under the NPRI program, facilities that use or process more than 10 tonnes/yr of 178 designated substances must report their releases to the environment or transfers off-site in waste of these substances to Environment Canada on an annual basis, which releases the data to the public. Facilities were first required to report their releases and transfers under the program in 1993.
- 13.1996 Annual Report, pp.119-121.
- 14.The Joint Board, OWMC Decision, Ch.3.
- 15.Apogree Research, Canadian Hazardous Waste Inventory.
- 16.Joint Board, OWMC Decision, Table 1. This estimate may be low, as Second Report of Progress Under the Canada-Ontario Agreement Respecting the Great Lakes Ecosystem 1995-1997, pg.9, giving figure of 1.8 million tonnes reported off-site transfers of hazardous and liquid industrial waste of 1996. The OWMC estimated total generation of all 'Subject' waste to be 5.4 million tonnes/yr.

17. Second Report of Progress Under the COA, pg.9 reports a 25% increase in transfers of hazardous and liquid industrial wastes off-site for disposal recorded through the waste manifest system between 1994 and 1996.
18. Environment Canada, National Pollutant Release Inventory: Summary Report 1994 (Ottawa: Minister of Supply and Services, 1996) pp.65-68; Environment Canada National Pollutant Release Inventory: Summary Report 1995 (Ottawa: Minister of Supply and Services, 1997), Table 27; Environment Canada National Pollutant Release Inventory: Summary Report 1995 (Ottawa: Minister of Supply and Services, 1998), pp.106-116.
19. Ministry of Finance, *The Ontario Economy, 1994-99*, URL: [www.gov.on.ca/FIN/english/Tab2htm.htm](http://www.gov.on.ca/FIN/english/Tab2htm.htm).
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23. Environment Canada, NPRI 1994 Summary Report, Table 38.
24. Figures provided in The Globe and Mail, November 24, 1994, citing the Ministry of the Environment as source.
25. Ministry of Environment and Energy, "Distribution of Hazardous & Liquid Industrial Waste in Ontario," unpublished document provided to CIELAP, March 1997.
26. Environment Canada, Hazardous Waste Branch, Transboundary Movement Division, February 22, 1999.
27. Taking Stock: North American Pollutant Releases and Transfer: 1995 (Montreal: North American Commission on Environmental Cooperation, 1998), Table 7-1.
28. Resilog, December 1996, Vol.10, No.1.
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30. S. Casey-Lefkowitz, "Transboundary Movements of Hazardous Wastes in North America: A United States Perspective," paper delivered at CIELAP Workshop on the Transboundary Movement of Hazardous Wastes In North America, October 1997.
31. Resilog, December 1996.
32. Controlling Industrial Discharges to Sewers (Toronto: Ministry of the Environment, 1988, pg.1.; Ministry of Environment and Energy, The MISA Industrial Program (Toronto: January 1994).
33. See, for example, Joint Board, OWMC Decision, pg. 6-26, Schedule G.
34. Ibid., pp. 6-44 - 4-46.
35. Office of the Fire Marshal, Protecting the Public and Environment by Improving Fire Safety at Ontario's Recycling and Waste Handling Facilities (Toronto: Ministry of the Solicitor General and Correctional Services, August 1997).
36. For a recent example of this problem see, McAndrew, "Recycle plant charged with toxic dumping."

37. Environment Canada and Ontario Ministry of the Environment and Energy, COA Stream 2 Progress Report (July 1995-August 1996) (Toronto: November 1996).
38. D. Mean and B. Longley, Evaluation of Quantities of Biomedical Waste Generated in Ontario (Mississauga: ORTECH, December 1992).
39. NPRI 1994 Summary Report, Tables 38 and 39.
40. Winfield, Hazardous Waste Management in Ontario, Table IV-10.
41. Joint Board, OWMC Decision, Table 1.
42. The Hon. N. Sterling, Minister of the Environment, Response to Order paper No 218, Question 2087, Filed August 25, 1997, by D. Augustino, M.P.P.
43. The Hon. N. Sterling, response to Order Paper No. 218, Question No. 2086, filed by D. Augustino, M.P.P., August 25, 1997.
44. Pers. Comm., Renato Legati, Senior Environmental Manager for Canadian Operations, Safety-Kleen Canada Ltd., March 25, 1997.
45. Ministry of Environment and Energy, Responsive Environmental Protection: Technical Annex (Toronto: MoEE, August 1996), pg. 77.
46. See, for example, Regulation 501/92.
47. Joint Board, OWMC Decision, pg. 3-4 and note 12.
48. M. Winfield and G. Jenish, Ontario's Environment and the 'Common Sense Revolution': A Third Year Report (Toronto: CIELAP, 1998), Figure (i)b.
49. Northing Left to Cut: A field report on activities of the Ontario Ministry of Environment and Energy (Toronto: Ontario Public Service Employees Union, January 1997), Figure 9.
50. Winfield and Jenish, Ontario's Environment and the 'Common Sense Revolution', Table iii and Figure iii.
51. Responsive Environmental Protection: A Consultation Paper (Toronto: Ministry of Environment and Energy, July 1996).
52. EBR Registry No. RA8E0023 - Draft Waste Management Regulation, June 2, 1998.
53. These exemptions were adopted in March 1998. See EBR Notice RA7E0012.P and R. Nadarajah and M. Winfield, Submission to the Ontario Ministry of Environment and Energy Re: EBR Notice RA70012.P Amendments to Regulation 347 (Toronto: Canadian Environmental Law Association and Canadian Institute for Environmental Law and Policy, November 1997).
54. For a detailed commentary on these proposals see R. Nadarajah, T. McClenaghan, and M. Winfield, Submission to the Ministry of the Environment RE: EBR Notice RA8E0023 Draft Waste Management Regulation (Toronto: Canadian Environmental Association (Brief #352) and Canadian Institute for Environmental Law and Policy (Brief # 3/98), September 1998).

55. See, for example, "Environmental Management Agreement among Dofasco Inc., Ministry of the Environment, and Environment Canada," January 8, 1998.
56. OFM, Protecting the Public and Environment by Improving Fire Safety at Ontario's Recycling and Waste Handling Facilities.
57. The Ministry's proposals include two minor positive revisions. These are the introduction of a requirement for semi-annual reporting on on-site disposal of 'subject' wastes under the Waste Generator Registration System, and the removal of the general exemption for waste agricultural pesticides from the definition of hazardous waste.
58. EBR Registry No. RA78E0018.P - RA7E0026.P, December 30, 1997.
59. EBR Registry No. PAE0029 - 1998 Model Sewer Use By-Law. June 14, 1998.
60. Environmental Commissioner for Ontario, Annual Report 1997 (Toronto: ECO, 1998), pg.4.
61. Controlling Industrial Discharges to Sewers (Toronto: Ministry of the Environment, 1988).
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**RESOURCES – NOT GARBAGE:  
MUNICIPAL SOLID WASTE IN ONTARIO**

By John Jackson

Prepared for  
The Environmental Agenda for Ontario Project

March 1999



## SUMMARY

### **Current Status**

In 1996, almost 9 million tonnes of municipal solid wastes were generated in Ontario. This amount was almost identical to the amount of wastes generated in 1987, almost ten years earlier. Approximately 80% of the waste generated was dumped into landfills in 1996.

As of 1996, garbage disposal had been reduced by 22% from 8.9 million tonnes in 1987 to seven million tonnes in 1996. This means that four years after the provincially-set 1992 interim target date, we still have not met the interim target of 25% reduction. This makes it very unlikely that the target of 50% reduction by 2000 will be achieved.

Disposal of garbage from residences has increased by 2.6% between 1987 and 1996. Disposal from the industrial, commercial and institutional sectors has decreased by 60%.

This failure to reduce wastes generated and disposed of results in: wasted valuable resources, increased energy use, increased contamination at both the production and disposal stages, increased use of water at the production stage, increased climate change because of the release of methane by decomposing garbage, and the release of toxic contaminants from waste disposal facilities to the air and to surface and ground waters.

The failure to reduce garbage generation and disposal to a greater extent has resulted in proposals for the expansions of many landfills across the province and for the creation of new mega-sites such as the Adams Mine in northern Ontario.

### **Causes of Problems**

This failure to reduce waste generated and disposed of reflects industry's failure to emphasize environmental factors in the design of products so as to increase the durability and repairability of products and to eliminate and reduce packaging. It also reflects the high consumption levels in our society. Per capita consumption in our society has increased by 45% in the past twenty years.

Provincial government actions and inactions have exacerbated these problems. These include: failure to enforce provincial regulations requiring refillable soft drink containers and the failure to expand such requirements to all beverage containers; the failure to require product stewardship by the manufacturers, distributors and sellers of products; the failure to ensure that industry pays for recycling costs, which has resulted in many municipalities reducing their efforts in recycling; and the weakening of the public role in decision-making around waste management, especially in the approvals process for waste disposal facilities.

### **Agenda for Change**

Used materials must not be seen as garbage, something to be gotten rid of, but as valuable materials to be preserved and reused. The waste management system should be transformed into a used materials management system.

The goals in this vision are:

- to minimize energy and materials consumption,

- to maximize the reuse of materials,
- to eliminate waste disposal,
- to provide citizens with a controlling role in the design and oversight of the used materials management system,
- to make producers and sellers responsible for their products,
- to educate the public on how they can achieve these goals, and
- to have government, industry and consumers working together to develop the used materials management system.

The components in this system are: use and waste reduction, producer responsibility, emphasis on reuse and refill, deposit-return systems, composting, curbside and depot collection, residuals to cleaner disposal, public control, and public education.

### **Key Recommendations**

- The Province should set a target of 80% reduction in disposal by 2005 in comparison with 1987 with an interim target of 60% by 2003.
- The Province should pass regulations requiring producer-operated take-back systems, including refundable deposits, on hazardous products, reusable products, and durables. Product producers, brand owners and distributors should be required to cover the costs of municipal composting, recycling and disposal programmes.
- The Province should ban the disposal of refillable, reusable, repairable, recyclable and compostable used items from disposal.
- The Province should develop standards for disposal facilities that require that specialized facilities be designed specifically to meet the hazards created by the specific types of materials permitted to be received at the facility. Mixed waste landfills should be banned. All wastes should go through a processing facility before going to disposal. The Province should require that disposal facilities be located in the community where the wastes are generated. A disposal facility should not be built unless the neighbourhood residents where it is to be located agree to the facility.



**Author:**

John Jackson has worked with citizens' groups on waste management issues for the past 20 years. He is coordinator of the Citizens' Network on Waste Management and led the successful fifteen-year struggle by groups in the Niagara Peninsula to defeat the Ontario government's plans to build a hazardous waste incinerator and landfill in West Lincoln. John is a member of numerous federal, provincial and regional committees on waste issues.

**Acknowledgements:**

The author wishes to thank those who contributed to this paper by reviewing the draft: Kelly Allan, Linda Ervine, Bob Gibson, Karen Guenter, Eleanor Hart, Alan Marshall, Janine Ralph, Bob Sexsmith, Mark Winfield, Elizabeth Wharton.



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## RESOURCES – NOT GARBAGE MUNICIPAL SOLID WASTE IN ONTARIO<sup>1</sup>

*The only species capable of generating waste  
is the human species.  
No other in nature is capable of producing something  
no one else wants to have.*

Gunter Pauli,  
*Upsizing: The Road to Zero Emissions:  
More Jobs, More Income and No Pollution*

### INTRODUCTION

On average, in Ontario each person disposed of about 348 kilograms of residential solid waste in 1996 for a total of 3.9 million tonnes.<sup>2</sup> This places us fifth in the world in per capita residential waste disposal, after the U.S., Australia, the Netherlands, and Japan.<sup>3</sup> When solid wastes from the industrial, commercial and institutional sectors are added, the wastes disposed of totaled approximately 7 million tonnes in 1996.<sup>4</sup> It is estimated that an additional 1.7 million tonnes of wastes were generated that were diverted from disposal through recycling and composting programmes.<sup>5</sup>

The flip side of high waste production levels in our society is the high levels of consumption. These levels have been growing dramatically during this century. In the U.S. the population tripled between 1900 and 1989. During the same period, the consumption of raw materials to manufacture products grew by seventeen times.<sup>6</sup> The patterns have been very similar in Canada.

Canada and the U.S. have approximately 5% of the world's population but consume more than a third of the world's resources.<sup>7</sup> If everyone on the planet had a lifestyle similar to the average North American, we would require three Earth's.<sup>8</sup> Calculations have been made to determine an individual's "fair Earthshare" if resources and assimilative capacity were equally divided among the Earth's inhabitants. Just purchasing and disposing of the *Globe and Mail* each day uses up 10% of an individual's "fair Earthshare."<sup>9</sup>

### ENVIRONMENTAL PROBLEMS FROM MUNICIPAL SOLID WASTE

#### Wasted Resources

Every time something is landfilled or burned in an incinerator or energy from waste plant valuable resources are lost. This means that more raw materials are extracted from the environment to create replacement or new products. This increased extraction adds to the perpetuation and increase in the devastation created by current forestry and mining practices.

The devastation to the environment is substantially greater at the production end than at the disposal end in the lifecycle of a product. Waste production processes in our society result in 94% of the materials extracted for production processes being turned into waste before we even see the product.<sup>10</sup>

#### Increased Energy Use

Making products from raw materials usually requires substantially more energy than reusing materials or making the same product from recycled material. For example, reuse of glass

containers saves 80% of the energy used to make glass.<sup>11</sup> It takes 25 times as much energy to make an aluminum item from raw materials as from recycled aluminum.<sup>12</sup> It takes almost twice as much energy to make a cereal box from raw materials as from recycled boxboard.<sup>13</sup> As a result, municipal waste adds to the environmental impacts, including climate change, from energy production.

### **Increased Contamination in the Production Stages**

Reducing the amount of materials thrown away as waste reduces the amount of new production and, as a result, reduces the contamination of air, water and land. For example, producing recycled paper results in 75% less air pollution and 35% less water pollution than making a paper product from trees.<sup>14</sup> When scrap iron is used instead of ore to make steel, mining wastes are reduced by 97%, air pollution by 86% and water pollution by 76%.<sup>15</sup> It also reduces the production of hazardous wastes.

### **Increased Use of Water**

It usually takes more water to make an item from raw materials than from recycled materials or to reuse a product. For example, it requires 60% less water to make paper from recycled fibres than from trees.<sup>16</sup>

### **Environmental Damage from Disposal of Municipal Solid Waste**

#### **Climate Change**

Methane is a potent greenhouse gas, contributing to climate change. On a per kilotonne basis, methane is approximately twenty-one times more potent than carbon dioxide as a greenhouse gas.<sup>17</sup> Methane is responsible for approximately 13% of all of Canada's greenhouse gas emissions.

As the organic wastes in solid waste landfills decompose, they generate methane. Almost three-quarters of this methane is released into the air, despite the presence of methane capturing systems at landfills. According to Environment Canada, solid waste landfills are the third largest source of methane emissions in Canada, accounting for almost one-quarter of all methane releases.<sup>18</sup>

Composting also creates methane, but much less of this is released to the environment. It is estimated that landfilling wastes rather than composting them results in the release of 93% more methane gases for the same amount of waste.<sup>19</sup>

The collection and transfer of used materials for recycling, composting or disposal also contribute to greenhouse gases through the release of CO<sub>2</sub> as a result of burning fuel during transportation. The City of Toronto estimates that collecting and transporting one tonne of used paper the average distances involved in the city results in the release of 12 kilograms of CO<sub>2</sub>. The lighter and less dense that the materials collected are the greater the amounts of CO<sub>2</sub> released per tonne because trucks are filled more quickly and more total miles must be traveled.<sup>20</sup>

#### **Release of Toxic Air Contaminants**

The incineration of used materials releases toxic air contaminants. These include carcinogenic and endocrine disrupting organic chemicals and heavy metals such as arsenic, lead, cadmium, mercury and chromium. Approximately 22% of the airborne dioxins that enter the Great Lakes come from municipal waste incinerators.<sup>21</sup> Despite the use of the most modern air pollution control equipment, incinerators or energy from waste plants still emit toxic air contaminants.

Municipal landfills also emit hazardous air contaminants, although only limited testing has been carried out on the air above landfills. Environment Ministry tests in 1995 of the air above Toronto's and York Region's main landfill, the Keele Valley site, found vinyl chloride, a known carcinogen, at levels of 2.9 micrograms per cubic metre. Ontario's standard for vinyl chloride in the air is one microgram per cubic metre over a 24-hour period.<sup>22</sup> These levels were found despite the fact that the Keele Valley site has modern gas collection and destruction systems. This information has led to 30,000 current and former owners of property near the Keele Valley landfill launching a class-action suit against Toronto for \$600 million.<sup>23</sup> Vinyl chloride, benzene and a dozen other volatile organic chemicals have also been found in the air around the Britannia landfill in Mississauga and the Brock West landfill in Pickering.<sup>24</sup>

### **Release of Toxic Contaminants to Surface and Ground Waters**

All solid waste landfills create a toxic soup called leachate. Leachate is created by the percolation of rainwater and liquids already in the waste through the layers of waste at the site and by the anaerobic decay of organic wastes. Leachate commonly contains aromatic hydrocarbons such as benzene and toluene, chlorinated benzenes, volatile halocarbons, phenols and various carboxylic acids.<sup>25</sup> Leachate can be released to either ground or surface waters. Some recent examples of municipal landfills leaking toxics include the Ennismore landfill site in Peterborough County, Manitoulin Island's landfill, a Sidney Township landfill near the CFB Trenton base, and a City of Kingston landfill leaking into the Cataraqui River. Although all these dumps were built prior to the modern engineered landfill, it is generally accepted that even the best-designed landfill will eventually leak.<sup>26</sup>

Elaborate leachate collection systems are now used to avoid ground and surface water contamination. The leachate that is thus collected is piped or trucked to a sewage treatment plant. Leachate trucked from landfills is the largest component of the hazardous wastes shipped off-site in Ontario for treatment or disposal. Municipal sewage treatment systems are not designed to destroy many of the hazardous contaminants in landfill leachate so the contaminants end up being discharged into rivers and lakes.<sup>27</sup>

Many of the toxic air contaminants released by incinerators and landfills also eventually fall to the ground becoming surface water contaminants.

### **Fires and Explosions**

Fires and explosions have occurred at waste treatment facilities because of improper storage or handling of materials. The latest year for which the Ontario Fire Marshall has gathered statistics on fires at waste facilities is 1995. They show that there were 15 fires at waste transfer sites, including two injuries. There were 35 fires in recycling facilities, including six injuries and one death. The injuries were primarily to workers at the facilities.<sup>28</sup> The most notorious fire at a recycling plant is the fire in July 1997 at Plastimet in Hamilton. This fire burnt for four days. A fire at a recycling plant in Etobicoke in February 1998 caused over a million dollars in damage. Municipal incinerators have also had explosions, resulting in injury and death to workers in the facilities.

The build up and seepage of methane from landfill sites into neighbouring homes has caused explosions and fires and long-term evacuations. In 1976 the residents of an 81-unit townhouse development in Kitchener started moving out of their homes because of fear of explosions from methane seeping from an adjacent municipal landfill. By 1986, the development had become a ghost town. In late 1993, the units were reopened after Waterloo Region spent over \$6 million on new gas extraction wells and a barrier wall between the landfill and the homes.

### **Other Environmental Effects**

These include truck traffic, noise, odours, litter, dust, attraction of rats, birds and insects, and aesthetic concerns.

In 1998, thirty-five families on Ralgreen Crescent in Kitchener filed a lawsuit against the City for \$65 million because of damages caused by an old municipal landfill site. Their homes were built on or near the landfill. The residents have been experiencing illnesses suspected to be caused by landfill gases leaking into their basements. Structural damage, including large cracks in the foundations, exterior walls and floors and garages, has occurred in their homes. The residents claim that the shifting of the ground as the garbage decomposes causes this damage.

## **CURRENT STATUS AND TRENDS**

### **Diversion from Disposal**

In 1987, the Liberal government set a provincial goal of reducing the amount of solid waste going to disposal by at least 50% by the year 2000 compared to the amount disposed of in 1987. An interim target of 25% reduction by 1992 was set. Disposal is defined to include landfill and incineration, including energy from waste plants. These targets were subsequently confirmed by the NDP government and by the current PC government.

As of 1996, garbage disposal had been reduced by 22% from 8.9 million tonnes in 1987 to 7 million tonnes in 1996.<sup>29</sup> This means that four years after the 1992 interim target date, we still have not met the interim target of 25% reduction. Disposal of garbage from residences has increased by 2.6% from 1987 to 1996. Disposal from the industrial, commercial and institutional sectors has decreased by 60%.

Reduction in garbage going to disposal has stalled in recent years. The amount of waste disposed of in 1996 is identical to that disposed of in 1994. This makes it even more unlikely that the 50% diversion target will be met by 2000 - a target that does not even begin to match the 80% diversion targets that numerous studies and experiences in many communities show is feasible.<sup>30</sup>

The Ministry of the Environment has redefined the waste diversion target to make it easier to achieve the 50% goal. The goal is now defined not as an absolute reduction in wastes going to disposal, but as a per capita reduction. On this basis there had been a 32% per capita reduction in wastes going to disposal in Ontario in 1996 in comparison with 1987 disposal levels. Even using this substantially more lax definition of the target, it is highly unlikely that the 50% waste diversion target will be met. Between 1994 and 1996, there was only a 2% increase in per capita diversion. At that rate, per capita diversion in 2000 would be 36%. This is substantially lower than the 50% target that the government has stated as its goal.

### **Reduction**

The reduction aspect of solid waste has not been taken seriously. Between 1987 and 1996, the total amount of solid wastes generated in Ontario was unchanged. In the residential sector, wastes generated *increased* by 27% while the population increased by only 15%.

This failure to reduce waste generated in the residential sector reflects the failure to emphasize environmental factors in the design of products so as to increase the durability and repairability of products and to eliminate and reduce packaging. It also reflects the high consumption levels in our society. Per capita consumption in our society has increased by 45% in the past twenty years.<sup>31</sup>

In the industrial, commercial and institutional sectors, wastes generated decreased by 23%. This reduction has focused on the stages of making their products and transporting them to retailers.



Industry has not placed the same emphasis on reducing consumer packaging, etc., which is necessary to reduce the generation of waste in the residential sector.

### **Reuse and Refill**

Ontario has regulations calling for the use of refillable containers for soft drinks and milk. Regulation 357 requires that all carbonated soft drinks be sold in refillable containers. However, Regulation 340 allows for the sale of carbonated soft drinks in non-refillable containers provided that a minimum of 30% of sales are in refillable containers and a 50% recycling rate is met.

Regulations 344 and 345, developed in 1972, limit the size of disposable milk containers, with the intention of promoting the use of refillable containers. Regulation 344 exempts certain recyclable milk containers from the refillable requirements.

Successive Ontario governments have repeatedly weakened the requirements for refillable soft drink containers. In the 1950's and 1960's almost all soft drinks were in refillables. In 1978, a gentlemen's agreement was made between the soft drink industry and the Province to have 75% of soft drinks in refillables. In 1985, a regulation was passed requiring 40% refillables if the recycling rate is less than 50% and 30% refillables if the recycling rate is at least 50%. These regulations are still in force. The provincial target set by the PC government in the 1970's was to have 75% of fluid milk sold in refillable containers.

Industry and government consistently ignore the refillable regulations for milk and soft drinks. Less than 2% of soft drinks are now sold in refillable containers and successive provincial governments over the past ten years have failed to enforce the regulations.<sup>32</sup> The situation is similar for milk containers. As the provincial government notes regarding refillable milk containers, "Over the years, exemptions have served to void the original intent of the regulations."<sup>33</sup> The province is proposing to revoke the requirements for 30% refillables for soft drinks.<sup>34</sup>

The Toronto Environmental Alliance launched a lawsuit in 1996 to try to enforce the soft drink refillable regulations against Coca-Cola Beverages Ltd. Later that year, the Provincial Government stopped TEA's private prosecution by stating that the Province was in negotiations with the company.

Despite the failure of the province and the soft drink industry to take refillables seriously, there is support for the use of refillable containers. A 1997 survey of Ontario residents found that 84% of the respondents believe that refillable beverage containers are better for the environment than single-use containers that require recycling after only one use; 80% believe that a deposit-return system with a preferential refund for refillable beverage containers should be required in Ontario. Sixty-eight percent of the respondents support a ban on non-refillable beverage containers.<sup>35</sup>

Some companies are using the refillables option. Many of The Beer Store's sales are in refillable containers.<sup>36</sup> A winery near Toronto has just introduced returnable-refillable wine bottles. Refillable milk containers are now used in some dairies in London, St. Thomas, Simcoe, Brantford, Stratford, Woodstock, Hamilton, Burlington, Ottawa, Carleton and Toronto.<sup>37</sup>

Refillable beverage containers are common in many European countries. For example, in Denmark 97% of all beverage containers are refillable; in Germany 76% of soft drinks are in refillables; in Austria 95% of mineral water is in refillables; in Norway, 60% of wine and liquor is in refillables.<sup>38</sup>

Reuse has become a major activity in the product distribution system. Reuse accounted for almost half of the packaging used in 1996.<sup>39</sup> This is overwhelmingly accounted for by the reuse of wood and plastic pallets for carrying products.

Reuse is also growing in construction, renovation and demolition activities.

### **Composting**

Approximately one-quarter of the solid wastes generated in Canada are organics that are compostable.<sup>40</sup> Approximately 37% of residential waste is compostable. In 1996, only seven percent of the residential waste stream in Ontario was composted in backyard composters or in central composting facilities. Data on composting by the industrial, commercial and institutional sectors is not available.

Ontario's regulations require municipalities with populations over 5,000 to encourage and support backyard composting. This generally takes the form of municipalities subsidizing the costs of backyard composters for residents. In municipalities over 50,000, the municipality is required to also provide for leaf and yard waste collection and composting. In almost all cases this takes the form of special pickups in the fall after the leaves have fallen and in early January for Christmas trees. Some municipalities also have a special pickup in the spring after people have cleaned up their yards. A few municipalities pick up compostables on a regular basis. This includes Guelph, with its wet-dry system, and St. Thomas and Tillsonburg.

In May 1998, the province issued draft guidelines for aerobic composting facilities and for compost use. The provincial government does not financially supported municipal composting programmes.

In June 1998, the Ministry issued for comment draft regulations for the approval, siting and operation of composting facilities for leaf and yard waste, compostable vegetable waste, and wood that is not painted, treated or laminated. These regulations propose that composting facilities be exempted from applying for certificates of approval. They would be under the new standardized approval regulations (SAR) where they simply notify the Ministry that they are setting up the facility and state that they are following the guidelines. These new provisions would reduce the opportunity for local residents to have input into the siting and operation of composting facilities.

A major problem that has arisen with composting is contamination. Compost is potentially a valuable resource that can add vitality to soils. Unfortunately, in some cases, the product from centralized composting facilities contains hazardous contaminants that do not make it suitable to grow food on. For this reason, in some cases, compost has been used as landfill cover. This does not make the best use of valuable resources.

Compost becomes contaminated because of the collection system, in which other wastes are intermingled with the compostables.

### **Recycling**

The main tool that the province and municipalities have relied upon to reduce waste disposal is recycling programmes, especially the blue box programme. Municipalities with a population over 5,000 are required to have a curbside recycling programme that receives a minimum of seven materials, including newsprint, aluminum, glass, steel, PET and a choice of two other materials. In 1996 the provincial government proposed to give municipalities more flexibility in choosing the materials they would recycle. But in November 1997, the province stepped back from these proposed changes.

Approximately 3.5 million households or 85% of the households in Ontario have curbside recycling service, primarily through the blue box. It is estimated that 85% of those households with access to recycling service use it on a regular basis.<sup>41</sup>

Despite this emphasis on household recycling, only 12% of household waste went into recycling programmes in 1996.<sup>42</sup> When the industrial, commercial and institutional sectors are added, approximately 16% of wastes went to recycling. *The Toronto Star* has calculated that only 18% of the recyclable materials in Ontario end up being recycled.<sup>43</sup>

Over the past few years Ontario's recycling programme has become more controversial for several reasons:

### **Costs**

Between 1985 and 1996, municipalities put \$375 million into the blue box programme; the province put in \$208 million and industry put in \$41 million.<sup>44</sup> But industry ended their contributions and as of March 1998 the provincial government ended all financial contributions to the programme.

Municipalities started recycling programmes with the understanding that they would share the costs with industry and the Province. Municipalities have become alarmed as the full costs of operating the blue box programme have been dropped on them. This cost is estimated to total \$43.6 million each year, after revenues from the sales of recyclable materials.<sup>45</sup>

Industry, especially Corporations Supporting Recycling (CSR) and the Canadian Soft Drink Association, say that the aluminum pop can is the "cash cow" that will finance the blue box. This cash cow, however, appears to be shrinking. The soft drink industry is increasingly using PET containers for their product instead of aluminum. The Association of Municipal Recycling Coordinators reports that over the past three years aluminum can tonnages have gone down while tonnages of PET containers have gone up. This is true even in those communities where CSR has had an advertising campaign to urge the public to put their pop cans into the blue box. This switch has dramatic financial implications for municipalities. In the spring of 1998, a tonne of aluminum cans sold for between \$1212 and \$1865; a tonne of PET bottles sold for between \$115 and \$407.<sup>46</sup>

The market prices for selling recyclable materials constantly fluctuate. This places municipalities in a speculative market, making it impossible for them to precisely predict the revenues from their recycling programmes.

When there are substantial differences in costs between recycling and disposal programmes, municipal councillors find it hard to justify keeping the recycling programmes going. This becomes especially difficult as other factors, such as increases in social service costs, place upward pressure on municipal tax rates.

### **Failure to Follow Regulations**

Until recently, Thunder Bay ignored the regulatory requirement to set up a curbside-recycling programme. Even though all municipalities over 5,000 in population are required to have curbside collection of recyclables, Thunder Bay with a population of approximately 110,000 had only a depot system for collecting recyclables, until two-and-a-half years after the date that it was required to have curbside collection. Thunder Bay only set up the programme after the province issued a control order against the city for its failure to obey the regulations.

Some municipalities, particularly in northwestern Ontario, are put into a difficult position in trying to follow the regulations because of the long distances that recyclables have to be

transported to get to market. This adds substantially to their costs, especially for heavy items such as glass. In some cases, these municipalities are stockpiling glass and looking at ways to use the glass in their communities, such as in road beds. In September 1998, Blind River announced that it was dropping its recycling programme because of the high costs.<sup>47</sup>

Other municipalities are now threatening to stop picking up certain materials in their blue boxes because of the failure of industry and the province to financially support the programme.

### **Deposit-Return**

Ontario's regulations require a deposit-return system for at least 30% of the soft drinks marketed. These are the same 30% that are supposed to be in refillable containers. As with the requirements for refillables, this requirement is being ignored by industry and government. Instead these containers end up on municipalities' hands in their recycling and disposal systems.

Manitoba and Ontario are the only provinces without substantial deposit-return regulatory requirements. Effective October 1998, British Columbia's deposit-return system was extended to all beverage containers except milk. Tetrapak containers were given an extra year to start a deposit-return system.

Deposit-return systems are much more effective than curbside collection methods for retrieving containers for reuse or recycling. Canadian and U.S. experience demonstrates that deposit-return systems result in recovery rates of 72% to 98% of beverage containers.<sup>48</sup> Current curbside collection in Ontario of soft drink packaging is only about 54%.<sup>49</sup> The best curbside collection programmes for beverage containers achieve less than 70% recovery.<sup>50</sup> Another benefit of deposit-return systems is that the containers are recovered in better condition - unbroken and with less contamination - and are, therefore, more compatible with reuse than are materials gathered at the curb.

The provincial government is currently assessing whether to continue having deposit-return requirements. The Toronto Environmental Alliance and the Citizens' Network on Waste Management have been leading a campaign to have the current regulations enforced and to expand them to all beverage containers. As of September 1998, 269 Ontario municipalities, representing almost 84% of Ontario's population, had passed resolutions asking the Province to have a strong deposit-return system.<sup>51</sup> A survey of Ontario residents found that 87% of Ontarians would support the government if it required a deposit on all juice, soft drink and bottled water containers; only 7% opposed such action.<sup>52</sup>

### **Recycling or Downcycling?**

Recycled materials frequently are not made into the same item again. For example, a PET bottle may be made into plastic fence posts. As a result, value is lost whereas in reuse programmes the same use is maintained and value is maintained. In addition, most items cannot be endlessly recycled. They eventually end up being disposed of because the quality of the material has deteriorated so badly. For example, the more they are recycled, the shorter paper fibres become. As the fibres get shorter they become too weak to be used.

Another factor that decreases the use of recycled materials for the production of the original item is that some Federal health regulations are barriers to recycling plastics into food containers because of concern about contamination of the food.

### **Provincial Proposals for Reform**

The Province plans to make the following kinds of changes to "promote diversion and recycling":

- revise the definition of recyclable material to encourage reuse and recycling;
- revise the source separation requirements for municipalities to allow for the use of wet-dry collection systems;
- place approvals for municipal recycling sites under the new standardized approval regulations process, where a certificate of approval is not issued (The municipality simply informs the Ministry that they are going to operate the facility. This reduces the former opportunities for public input.);
- remove the regulatory requirement for a 50-metre buffer around municipal recycling facilities, if all processing and storage is within enclosed buildings; and
- remove the regulatory requirements for large industrial, commercial and institutional establishments to develop waste audits and amend the requirements for waste reduction workplans.

Concern has been raised by the public about these lessening of requirements for recycling facilities because of past experiences where recycling facilities have caused serious community problems. The Plastimet fire in Hamilton is the most spectacular example of this kind of problem.<sup>53</sup>

### **Incineration and Energy from Waste**

Three incinerators and energy from waste facilities for municipal waste now operate in Ontario; these are located in Hamilton, London, and Brampton.

In April 1991, the NDP government banned the construction of new municipal solid waste incinerators and the expansion of existing ones. This ban was put into regulation in September 1992. In December 1995, the PC government lifted this ban. They also put into place guidelines for combustion and air pollution control requirements for new municipal waste incinerators. Since that time there has been substantial lobbying by the incinerator industry for new incinerators, but none have been built or expanded. Public concern and the high costs of building and operating incineration plants are the main reasons why there has not been more activity in this sector.

### **Current Activity**

Since the lifting of the ban, the Ministry of the Environment has issued one certificate of approval for an incinerator for municipal waste. This was granted in December 1996 for the operation of a five-tonne per day incinerator in the Town of Durham in southwestern Ontario. The incinerator was not installed because of the municipality's concerns about the costs of the facility. After one year the certificate of approval expired.

KMS Peel Inc., which operates the energy from waste plant in Brampton, is preparing environmental assessment documents for an expansion of their plant. This plant receives municipal wastes from throughout the Region of Peel. KMS Peel plans to submit its final EA documents to the Ministry in 1999.

Toronto plans to put out a call for proposals for disposal options for its waste in 1999. Among the options that will be considered is incineration or energy from waste.

Simcoe County had considered building an energy from waste plant, but, after extensive lobbying by local environmentalists, the County withdrew incineration and energy from waste from its list of options.

The use of burn barrels by householders to burn their garbage is a serious concern. The U.S. Environmental Protection Agency reports that burn barrels emit significant quantities of volatile

organic compounds, chlorobenzenes, dioxins and furans, and metals to the air. The EPA concluded that "the large magnitude of the emissions [from backyard burning of residential wastes], coupled with the concentration of these emissions in the local neighborhoods due to poor dispersion, will lead to increased direct inhalation exposure."<sup>54</sup> The extent to which burn barrels are used in Ontario is not known. The Province does not ban burn barrels. It is left up to the by-laws of each municipality to deal with the burn barrel issue. Most cities have banned the use of burn barrels.

### **Current Trends**

There is an increasing focus on waste derived fuel as a method to get rid of municipal garbage. This includes sending materials such as tires and wood waste to be burned as fuel in industrial operations.

The concept is now being expanded to the creation of special pellets out of municipal waste to be sold as fuel. For example, the Herhof system, which is now being promoted throughout Ontario and is in use in Caledon, proposes to make a "stabilate" out of the product from the composting process. This would be sold as refuse derived fuel to cement, steel and hydro producers.<sup>55</sup>

The province is proposing to facilitate this process by amending the regulations to expand the definition of waste derived fuel and to specify the thermal energy value that must be met to be defined as waste derived fuel.

Another trend in the incineration industry is to try to find ways to avoid the costs of disposing of incinerator ash in solid waste or hazardous waste landfills. Approximately 30% by weight of the wastes that go into an incinerator or energy from waste facility ends up as ash that must be removed from the plant.<sup>56</sup>

KMS Peel is proposing to mix the bottom ash from their incinerator with plastic wastes. These would then be used to manufacture shipping pallets and paving stones.<sup>57</sup>

### **Landfill**

In 1996, 7 million tonnes of solid waste were disposed of in Ontario. Approximately 95% of this went to landfill.

Just over five years ago a waste disposal crisis seemed imminent across Ontario. Ministry of the Environment information documents asserted:

By the year 2000, nearly 250 currently active landfills are expected to be full. However, as a result of the loss of actual disposal capacity by the closing of landfill sites, more than half of Ontario's residents will have no place to dispose of their garbage by as early as 1996.<sup>58</sup>

Another Ministry backgrounder announced: "Waste Crisis in the Greater Toronto Area."

The waste disposal crisis seemed to fade away. Among the reasons for this were:

- strong local citizen action that forced communities to drop their focus on disposal and look at ways to reduce the garbage produced,
- the growth of recycling programmes, and
- the substantial movement of wastes, especially from the industrial and commercial sectors, to cheap landfill sites in the U.S.

But many neighborhoods are still confronted by the prospect of their communities being disrupted by new or expanded landfills as the search continues for landfills in many communities across Ontario.

Some recent trends in the landfill situation include:

1) There have been substantial decreases in some of the landfilling fees charged. At one point dumping fees at Toronto's Keele Valley site were close to \$180 per tonne. As of December 1998, the fees were \$55 per tonne.

2) Municipalities are seeing landfills as a way to make money. For example, Osgoode Township near Ottawa is considering expanding the Township's Springhill Landfill site, even though they have enough space to satisfy the needs of their residents for 40 to 60 years. The reason is that the Township sees the landfill as a business opportunity that could "provide significant revenue for the municipality over a period of many years" if it received wastes from throughout eastern Ontario.<sup>59</sup>

Waterloo Region has become alarmed at the revenues they are losing because industrial and commercial wastes are being shipped to cheaper sites in the U.S. They have given special landfill fee reductions to commercial and industrial waste generators.<sup>60</sup>

3) More municipalities are focusing on expanding existing landfills rather than seeking to site new large landfills on greenfield sites. Examples of this are the landfills in Grey County, Warwick, and Richmond. Municipalities generally see it as easier to expand a site rather than get a whole new community angry with them if they try to site a new one. Also it tends to be easier to get provincial approval for an expanded site than it is for a new site.

4) Increasingly landfills are being permitted to receive wastes from throughout Ontario. Previously most certificates of approval limited the area from which wastes could be taken to a landfill to the municipalities surrounding the landfill.

5) As more landfills are developed and licensed by private companies, narrow definitions of need and alternatives for environmental assessment purposes are used. When dealing with private sector proposals, the Ministry accepts opportunity as the only need description that is required. Opportunity means the ability to find wastes to fill the landfill. The opportunity to make money has become all that is needed to define need. Alternatives are also very scoped. In private sector proposals, the Ministry does not require the proponent to do more than a very limited assessment of alternative ways to address the need and they are only asked to look at other sites that the company already owns. This means that, when private companies provide disposal facilities for municipal solid waste, the debate is much more scoped than it would have been if the proponent were a municipality.

6) As a result of changes to the *Municipal Act* made in 1993, by majority vote a county can take over responsibility for waste management in the county, including taking over landfills currently owned and operated by a township or town. This has resulted in weakened local control over waste disposal operations in many small municipalities. It has, however, in some cases resulted in improved operations at these already existing landfill sites and in progress on clean-up activities because the upper tier municipality has access to more money to carry out the activity.

7) When landfills leak, the owner of the site sometimes acquires adjacent land instead of cleaning up the contamination or preventing further leakage. Ontario's Reasonable Use Guidelines require that groundwater beyond the boundaries of a landfill site not exceed certain levels. Recently, when this guideline is exceeded, owners have, with the support of the Ministry of the Environment, bought adjacent land so the guideline can be met. This allows the contamination

of groundwater under more and more pieces of land. The most recent example of this occurred when the Town of Haileybury bought 55 hectares next to their landfill to be a leachate contaminant attenuation zone.<sup>61</sup>

8) Competition in the landfill field in Ontario has recently diminished. Canadian Waste Services bought out all the solid waste landfill operations previously owned by Laidlaw and Philip Environmental, with the exception of Philip Environmental's Taro Landfill in Stoney Creek. As municipalities increasingly look to the private sector to provide them with landfill space instead of going through the expensive and politically difficult task of siting landfills, the control by Canadian Waste Services over landfill space will grow.<sup>62</sup> Canadian Waste Services has recently become a partner in Notre Development's Adams Mine landfill proposal, a proposed landfill that would be large enough to take one-seventh of all the solid wastes currently disposed of in Ontario for the next twenty years.

### **Toronto**

In early 1998, Toronto began shipping part of its municipally collected waste to a BFI-owned landfill near Ann Arbor, Michigan. As of 1999, Toronto was shipping 450,000 tonnes of garbage to this site each year. This has resulted in considerable concern by citizens in Michigan who have joined with Windsor activists to form "No Waste - the Network of Waste Activists Stopping Trash Exports".

Toronto plans to issue a request for proposals for disposal in 1999.

### **Adams Mine**

Notre Development Corporation plans to build a landfill for municipal solid waste in an abandoned iron mine in Temiskaming, about ten kilometres southeast of Kirkland Lake. Northeastern Ontario residents are alarmed at the proposal because the hydraulic trap containment system proposed to keep hazardous leachate away from ground and surface water is unproven. Also local residents object to waste from southern Ontario being shipped to the North, leaving northern residents to bear all the risks. It is estimated that 90 to 95% of the area's residents are opposed to the plan.<sup>63</sup>

After fifteen-hearing days in a process that had been severely scoped by the Minister of the Environment, in June 1998 the Environmental Assessment Board gave approval to Notre Development Corporation to develop Adams Mine as a landfill to receive waste from anywhere in Ontario. The approval was given on the condition that the proponent meet 26 conditions relating to monitoring/operation and remedial action and contingency plans, contaminating lifespan, financial assurance, and community consultation and participation. In addition, the company was to conduct one more test on the underlying groundwater movement. One Board member dissented stating that "it is my considered opinion the proponent has not fulfilled the onus placed on it to demonstrate the effectiveness of the proposed hydraulic containment design."<sup>64</sup>

A coalition of farmers, residents and environmental groups in the area appealed the Board's decision. In late August, the provincial cabinet denied the appeal, supporting the Board's decision. The local coalition has filed an application for review by the courts of the hearing board's decision.

In March 1999, the Ministry stated that it intends to issue the certificate of approval for the site. The approval is for the disposal of one million tonnes of waste a year for the next twenty years. This would take one-seventh of all the wastes currently disposed of in Ontario. Over the past few years, Notre Development has approached municipalities throughout southern Ontario as potential customers. The main customer that the company is looking to is Toronto and the area surrounding Toronto.



## **Provincial Changes**

**1) Hearings:** Since the introduction of the Environmental Protection Act and the Environmental Assessment Act, rarely have landfills been approved without a substantial hearing. Since the P.C. government came into power, this situation has changed. In July 1996, despite the fact that the Hamilton Region Conservation Authority and 3,000 members of Stoney Creek Residents Against Pollution (SCRAP) requested a hearing, the Ministry approved a landfill site in a quarry in Stoney Creek without a hearing. This is the Taro site owned by Philip Environmental.

A municipal landfill in Dufferin County near Orangeville was approved in December 1997 without a hearing.

The Adams Mine landfill, a major proposal for 20 million tonnes of waste, was put through a quick, very scoped hearing. The only topic that could be discussed at the hearing was the hydraulic containment system. The Minister announced the hearing in December 1997 and stated that the Board decision had to be made by May 1998. This was later extended by one month.

**2) Intervenor Funding:** In order to support public participation in hearings before administrative tribunals on environmental matters, successive governments have awarded intervenor funding to citizens' groups to hire lawyers and technical experts. This practice first began in 1984 when the P.C. cabinet began giving intervenor funding on an ad hoc basis. This was formalized in April 1989 when the Liberal government brought in the *Intervenor Funding Project Act*. This legislation was extended in April 1992 by the NDP government. In April 1996, the P.C. government let the legislation expire, thus ending intervenor funding for citizens to participate in hearings.

As a result, because of lack of funding, the concerned citizens who were opposed to the Adams Mine landfill proposal were severely limited in the number of expert witnesses that they were able to call. In a hearing on a proposed PCB waste transfer and processing facility in Northumberland, the hearing panel expressed concern about the inability of concerned citizens to launch a case.<sup>65</sup>

**3) Landfill Standards:** New landfill standards have been passed into regulation by the government effective August 1, 1998. These standards include mandatory air emissions controls, assessment of hydrogeology and surface water, generic and site-specific landfill design standards, requirements for site operations and monitoring, closure and post-closure care requirements, and financial assurance.

Describing the new standards, the Ministry states: "The advantage of generic designs is the added certainty they bring to the approvals process."<sup>66</sup> It is likely that these standards will be used in the future as a justification for eliminating hearings or restricting the topics discussed at hearings.

Ontario's proposed waste management regulation<sup>67</sup> includes provisions that would allow changes to an approval for a landfill without going back for a new hearing or, in some cases, without even having to notify the Ministry of the Environment that the changes have been made. These include extending the time that the landfill can be used, expanding the area from which wastes can be taken, and alterations in pollution control equipment and the contours.

## **Producer Responsibility**

Does the responsibility of the manufacturer and distributor of a product end when the product is put on the store shelf? In Ontario, for the most part the answer to this question is "Yes". In Ontario the overwhelming responsibility for dealing with used materials and their associated

wastes rests with municipalities. In Europe and some parts of Canada, this answer is not accepted. There the responsibility is placed on the producer of the product.

Producer responsibility or extended producer responsibility, as it is sometimes called, takes many forms:

- return to retailer or manufacturer systems, sometimes called take back systems (e.g., electronic equipment, computers, household appliances, used oil, tires, automobiles, cameras, batteries, drugs, beverage containers, pesticide containers); these often have a deposit attached to them at the time of purchase to encourage consumers to return the used product to obtain a refund;
- manufacturer, brand owner and distributor operated and paid for collection systems for retrieving products sold (e.g., the system in Germany for retrieving packaging); and
- payments by manufacturers, brand owners and distributors to municipalities for all or part of the costs for operating a recycling system.

There is broad public support in Ontario for producer responsibility. Over 70 municipalities have passed resolutions calling for full producer responsibility for used materials. Seventy-four percent of Ontarians believe that "product manufacturers and their consumers" should pay for the disposal and recycling of consumer packaging while only 14% believe municipal taxpayers should pay.<sup>68</sup>

Some companies in Ontario have set up producer responsibility systems. Examples are the Brewers of Ontario, with their take back system for beer containers and packaging, and Canadian Tire, Zellers, Radio Shack, Black's Photography, Astral Photo Images and Battery Plus, which take back worn out rechargeable batteries.

Despite this widespread support for producer responsibility and the fact that some companies are assuming responsibility, very little has been done in Ontario to support and require producer responsibility. A recent survey of Canadian jurisdictions by Environment Canada showed that Ontario had done less to encourage producer responsibility than any other province in Canada.<sup>69</sup>

Successive provincial governments have discussed producer responsibility schemes for over a decade but no provincial action has been taken to require such responsibility. Instead, provincial governments have taken actions to undermine or discourage producer responsibility. Ontario governments have failed to require the soft drink industry to follow provincial regulations requiring deposit-return systems. The current provincial government is proposing to drop these requirements.

In 1997, when municipalities such as North York and Windsor-Essex County were planning to use powers granted to them under Bill 26 to raise money from producers, such as wine and liquor stores and newspapers, to cover their costs of disposing of and recycling their products, the Ministry of Municipal Affairs and Housing quickly passed a regulation that "prohibits charges being imposed for the management (including collection, disposal, reuse and recycling) of any waste materials except on the person who actually discards the material or except where the charges relate to the cleanup of illegally disposed of waste."<sup>70</sup>

In June 1998, the province brought forward a proposed regulation for "manufacturer controlled networks." The intent of these regulations is to facilitate product stewardship programmes. A manufacturer controlled network is a "waste management system of an original product manufacturer, that may include MCN consolidation sites and MCN collection systems, for the receiving, collection, handling, sorting, bulking, baling, packaging, temporary storing,

transferring and transporting of a spent product."<sup>71</sup> This regulation would give such networks exemptions from certain requirements of the Environmental Protection Act, such as the need for certificates of approval and the filling in of manifests when transporting the materials.

In October 1998, Ontario's Minister of the Environment called on the private sector to assume their "fair share" of the costs of waste diversion programmes by making financial contributions to a new "waste diversion organization." The purpose of this organization is "to give municipalities the tools to reduce the cost of their recycling programs and to develop, implement and fund municipal initiatives to increase waste diversion." The Liquor Control Board of Ontario made an initial contribution of \$4 million. The Minister said that if industry fails to voluntarily make enough financial contributions to the new waste diversion organization, the government will require them to contribute.<sup>72</sup> Enough details have not yet been provided on this programme to determine the extent to which it will lead to producer responsibility.

## **VISION FOR THE FUTURE**

On the basis of the experiences that citizens across this province have had with our current solid waste management system, citizens have developed a vision of the direction that we must take.

The goals in this vision are:

- to minimize energy and materials consumption,
- to maximize the reuse of materials,
- to eliminate waste disposal,
- to provide citizens with a controlling role in the design and oversight of the used materials management system,
- to make producers and sellers responsible for their products,
- to educate the public on how they can achieve these goals, and
- to have government, industry and consumers working together to develop the used materials management system.

The core of this shift is to make all decisions on the basis of not viewing used materials as garbage, as something to be gotten rid of, but instead as valuable used materials to be preserved and reused. The waste management system should be transformed into a used materials management system.

Achievement of our vision involves the following components:

### **Use and Waste Reduction**

Waste reduction efforts usually focus on lessening the amount of materials used in a product or package. This includes, for example, light-walling the container or increasing the efficiency of the manufacturing processes by using fewer resources. While such initiatives are essential, they are not sufficient to achieve the reduction goals that we have set.

Focus on used materials management means that we must devise lifestyles and provide consumer choices that encourage us to live better with less. It also means that products should be designed to last longer and to be repairable. Whenever possible, packaging should be eliminated.

Use reduction should also focus on eliminating the use of hazardous materials in the production of products.

## **Producer Responsibility**

Full producer responsibility should be at the core of the used materials management system. A key component of producer responsibility is the requirement for industry to take back what it produces after the consumer is finished using it - to accept responsibility for the product throughout its entire life-cycle. The takeback principle encourages companies to use fewer resources in the production process, to design for reuse and remanufacturing, and to become more eco-efficient.

## **Emphasis on Reuse and Refill**

Reuse and refill should be stressed to minimize the use of new raw materials and to decrease the consumption of energy. This should begin with all beverage containers and rapidly be expanded to other containers. Non-reusable products and non-refillable containers should be phased out. For example, throw-away-after-single-use items, such as disposable cameras, should be banned.

Community reuse facilities should be set up. These easily accessible neighbourhood facilities include exchange programmes, repair shops, and mechanisms for sharing tools, lawn mowers, etc.

## **Deposit-Return Systems**

The most effective way to ensure that product take-back systems work and to increase reuse and refill is through deposit-return systems. Deposit-return systems should start with all beverage containers and then be extended to other products such as household hazardous waste products and packaging (e.g., used solvent containers, batteries, pesticides, paints) and durables (e.g., appliances, computers and electronic equipment).

## **Composting**

Backyard composting of residential wastes should be stressed. Apartment and condominium complexes should set up small-scale composting facilities for each building. Apartment buildings should be designed to facilitate the use of composting facilities. In addition neighbourhood composting facilities should be set up.

The use of centralized facilities should be carefully assessed, since there tends to be greater contamination in such facilities. However, they may prove to be the most effective way to recover the compostables from apartment buildings, especially in apartment buildings that have not been specially designed to support composting programmes.

Restaurants and grocery stores, as well as other industrial, commercial and industrial facilities should send their organic wastes for reuse or composting, or set up their own composting facilities on site. They could then sell or give away the compost to their customers.

## **Curbside and Depot Collection**

Curbside and depot collection should be set up only for the used materials that are not covered by take-back and deposit-return systems, or backyard or community composting facilities. For example, recyclables such as newsprint, old corrugated cardboard and fine paper as well as containers that do not lend themselves to return systems would continue to be collected in curbside recycling systems or at recycling depots in smaller communities. Other products such as non-recyclable fibres, brush and trees that do not break down well in backyard composters could be collected at curbside and taken to community or centralized composting facilities.

Apartment buildings should be designed to facilitate separation of used materials at source for ease of use and to facilitate the gathering of uncontaminated recyclables and compostables.

### **Residuals to Cleaner Disposal**

Reusables, compostables, recyclables and hazardous materials should be banned from disposal at solid waste facilities.

With diversion rates of at least 80% by 2,000 in the new used, materials management system, disposal facilities would be much smaller. As well, with the prohibition of both hazardous materials and compostables from disposal, the production of leachate will be decreased and will be less hazardous. It will be possible to develop dry fills and disposal facilities that are specially designed for the specific materials being sent to them. The large, multi-material, mixed waste landfill will be an historic artifact. All wastes should go through a processing facility before any wastes are disposed of. Such smaller, less hazardous facilities will allow for more flexibility in siting and will be more acceptable to communities.

Disposal facilities should be located in the community where the wastes are generated. This will encourage local residents to be more responsible since it will make them have to live with the consequences of any bad decisions they make in the used materials management system. This approach is also essential for environmental justice reasons.

Incineration and energy from waste plants should not be part of the disposal option. They waste valuable used materials and are a very inefficient energy source. They also are a major source of environmental contamination from their stack emissions and the ash left over from the burning process.

### **Payment for Collection, Recycling, Composting and Disposal**

In the used materials system, most costs will be covered directly by the producers, brand owners and distributors of the product through take-back systems.

The cost of handling those materials that are still left for the municipality to take care of, i.e., going into the curbside and depot system, should be handled to the largest extent possible by the producers of the products. There may be some costs left over that cannot be reasonably allocated back to the producers of the products. These costs could be recovered through user fees charged to the residents and institutions, commercial and industrial operations that use the system. A properly set up user fee system will encourage people to properly use the used materials system, i.e., encourage them not to throw away valuable used materials.

### **Public Control**

Local people should have control over the used materials management strategy in their community. For example, a disposal facility should not be located in a neighbourhood unless the local people willingly accept it. No one community should be the repeated recipient of undesirable used materials management facilities. Compensation mechanisms should not be used to bribe communities into accepting undesirable waste facilities.

Community monitoring committees should be set up for used materials management facilities on which local neighbours form the majority. If the community is not satisfied that the promises made when the facility was approved are being met, the community should be able to close down the facility. This committee should also have the power to require a formal public inquiry when a disaster such as that at Plastimet in Hamilton occurs.

## Education

Education programmes are essential for the development and implementation of a used materials management strategy. People must understand the implications of their consumption habits and of the ways that they handle used materials. They must understand the options for addressing waste management problems. Educational programmes are a central aspect behind effective involvement in the decision-making process.

## Enhanced Employment and Economic Vitality

Long-term economic vitality is dependent on making the transition from a wasteful society to a conserver society. The used materials approach, based on reusing valuable resources and reducing the consumption of raw resources and energy, ensures an economy that has the materials needed to produce the items that we and future generations will need. An economy focused on reusing and recycling used materials will also increase employment.

A study by the Tellus Institute for Resource and Environmental Strategies compared the economic impacts of increasing the proposed waste diversion targets for the Greater Toronto Area from 50% to 80%.<sup>73</sup> They concluded that the economic advantages would be:

- \* 2,214 more jobs, primarily in the low tech sector,
- \* establishment of 19 new recycling industries, and
- \* revitalization of deteriorating industrial sectors because the new industries could be sited in abandoned industrial buildings.

## RECOMMENDATIONS FOR PROVINCIAL ACTION

### Targets

**Recommendation 1:** The Province should set a target of 80% reduction in disposal by 2005 in comparison with 1987 with an interim target of 60% by 2003. This target should be measured on an absolute basis - not per capita. Disposal should continue to be defined as landfill and incineration, including energy from waste.

### Take-Back and Refillables

**Recommendation 2:** The Province should revise the deposit-return and refillables regulations for soft drinks to raise the minimum refillables rate from 30% to 90% by 2003. The Province should place similar requirements on all beverage containers, including milk, soft drinks, wine, liquor, juices and water. Refillable regulations should also be developed for all other containers. The Province should enforce its deposit-return and refillables regulations.

**Recommendation 3:** The Province should pass regulations requiring producer-operated take-back systems, including refundable deposits, on hazardous products, including batteries, pesticides, paints and cleaners, on tires and on durables such as appliances, computers and electronic equipment.

**Recommendation 4:** Systems for refill, reuse and repair should be readily available to everyone.

### Composting

**Recommendation 5:** The Province should provide financial and technical support for backyard, neighbourhood and centralized composting facilities.

**Recommendation 6:** Neighbourhood composting facilities could be approved under standardized approval regulations. These regulations should include requirements for consultation with neighbours of the proposed facility.

**Recommendation 7:** The Province should require that centralized composting facilities receive a certificate of approval and there should be a discretionary hearing determined on the basis of public demand or the concerns of the Ministry's Director.

**Recommendation 8:** The Province should require screening processes to ensure that composted material does not contain hazardous materials.

**Recommendation 9:** The Province should require product producers, brand owners and distributors to contribute to the costs of municipal composting programmes. Large commercial agri-businesses should be required to contribute to these costs, but small farm producers should not.

### **Recycling**

**Recommendation 11:** The Province should maintain and enforce its requirements for curbside collection of recyclables in all communities with a population over 5,000.

**Recommendation 11:** The Province should require that recycling facilities receive a certificate of approval to operate and there should be discretionary hearings if there is a public call for hearings or if the Ministry's Director has concerns. The current requirement for a 50-metre buffer zone around municipal recycling facilities should be maintained. The requirements for buffer zones and hearings should apply to both municipal recycling facilities and private operations.

**Recommendation 12:** The Province should require that product producers, brand owners and distributors cover the costs of municipal recycling programmes.

### **Incineration and Energy From Waste**

**Recommendation 13:** The Province should place a ban on the construction of new incinerators or energy from waste plants for municipal solid waste. This ban should include a ban on the production of refuse derived fuel that is intended to be used in incineration processes.

**Recommendation 14:** The Province should require that existing municipal solid waste incinerators and energy from waste plants be phased out by 2005.

**Recommendation 15:** The Province should ban the use of burn barrels for municipal solid waste.

### **Disposal**

**Recommendation 16:** The Province should ban the disposal of refillable, reusable, repairable, recyclable and compostable used items.

**Recommendation 17:** The Province should develop standards for disposal facilities that require specialized facilities designed specifically to meet the hazards created by the specific types of materials to be received at the facility. Unprocessed mixed municipal solid waste should be banned from landfills.

**Recommendation 18:** The Province should require that disposal facilities be located in the community where the wastes are generated.

**Recommendation 19:** All disposal facilities should be subject to the full Environmental Assessment process, including a hearing, and assessment of need and alternatives.

**Recommendation 20:** Participant and intervenor funding should be required by provincial law for concerned citizens both at the hearing and pre-hearing stages.

**Recommendation 21:** A disposal facility should not be built unless the neighbourhood residents where it is to be located agree to the facility. The definition of neighbourhood and of the extent and nature of the indication of agreement will have to be worked out through further discussions across the province. If a site cannot be agreed to for a facility, the community should explore other methods for handling the waste.

**Recommendation 22:** The Province should require that a community liaison committee be set up for each disposal facility. Neighbourhood residents should have the majority of seats on the committee.

**Recommendation 23:** If significant violations of the certificate of approval occur and corrective actions are not implemented within a satisfactory timeframe, the community liaison committee should have the power by majority vote to require the Province to close the down the facility and/or hold a formal public inquiry.

**Recommendation 24:** The Province should require product producers, brand owners and distributors to contribute to the costs of municipal disposal programmes.

**Recommendation 25:** Disposers of wastes should be required to contribute to the costs of municipal disposal and composting programmes through user fees, sometimes called “pay as you waste” or “pay as you throw” systems. Such systems should not, however, replace the requirements for the producers and sellers of products to contribute to these costs.

### **Hazardous Wastes**

**Recommendation 26:** The Province should ban hazardous materials, such as pesticides, fertilizers, and batteries, from the composting, recycling and disposal streams. The most effective way to ensure that hazardous materials do not enter the municipal solid waste stream is to ban the use of some of these items or ban the inclusion of certain hazardous substances in them.

### **Industrial, Commercial and Institutional Actions**

**Recommendation 27:** The Province should require industrial, commercial and institutional facilities to conduct waste audits and develop waste reduction plans with a particular focus on reduction and reuse. The plan should be available to the community for comment and should be assessed by the Province for adequacy and accuracy. Failure to develop and implement an acceptable waste reduction plan should result in provincially-imposed penalties.

**Recommendation 28:** The Province should require industrial and commercial operations to ensure that their products and services are designed and delivered in ways that support reuse, composting, and recycling, and eliminate or minimize the need for disposal.

### **Provincial Actions**



**Recommendation 29:** The Province should set an example by conducting waste audits and developing and implementing waste reduction plans.

**Recommendation 30:** The Province should enact purchasing policies that emphasize reduction, reuse and recycling criteria.

### **Education**

**Recommendation 31:** Governments, schools, industry and environmental and community organizations should have educational programmes to make the public aware of the need to reduce consumption of resources and of how they can minimize their resource consumption and waste generation.

**Recommendation 32:** Government and industry should financially support environmental and consumer organizations to put together and distribute public service pieces that encourage reduced consumerism. All media should be required to use these public service pieces.

## ENDNOTES

- <sup>1</sup> In this paper, the term municipal solid waste refers to residential, industrial, commercial and institutional wastes that are not designated by provincial regulations as hazardous wastes. It includes both wastes that municipalities are responsible for collecting, composting, recycling or disposing of, whether by their own workforce or by contract with private companies, and wastes that industrial, commercial and institutional organizations themselves take for reuse, recycling, composting or disposal.
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- <sup>4</sup> *Recycling Roles and Responsibilities, Final Report*, Appendix E.
- <sup>5</sup> *Ibid.*
- <sup>6</sup> John E. Young and Aaron Sachs, *The Next Efficiency Revolution: Creating a Sustainable Materials Economy* (Washington, DC: Worldwatch Institute, 1994), p. 14.
- <sup>7</sup> Lester R. Brown and Christopher Flavin, "China's Challenge to the United States and to the Earth," *World Watch*, (September/October 1996), p. 10.
- <sup>8</sup> Mathis Wackernagel & William Rees, *Our Ecological Footprint: Reducing Human Impact on the Earth* (Gabriola Island, BC: New Society Publishers, 1996), p. 158.
- <sup>9</sup> *Ibid.*, p. 88.
- <sup>10</sup> Vanessa Baird, "Trash Inside the Heap," *New Internationalist*, (October 1997).
- <sup>11</sup> Argonne National Labs for U.S. Department of Energy, *Container and Packaging Recycling Update* (Spring 1995), p. 3.
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- <sup>14</sup> Robin Daddar, "Recycling the statistics are astounding," *Environmental Science & Engineering* (May 1997).
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- <sup>16</sup> *Ibid.*
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- <sup>19</sup> *Ibid.*
- <sup>20</sup> Memo to Works and Utilities Committee, City of Toronto, "RE: The Issues Associated with a Deposit Return System for Alcoholic and Non-Alcoholic Beverage Containers" (March 18, 1998), p. 11.
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- <sup>22</sup> *Hazardous Materials Management* (June/July 1995), p. 51.
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- <sup>26</sup> Jerry A. Nathanson, *Basic Environmental Technology: Water Supply, Waste Management and Pollution Control*, 2nd Edition (Upper Saddle River, New Jersey: Prentice Hall, 1997), p. 298.
- <sup>27</sup> *Ibid.*, p. 230.
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- <sup>29</sup> Data in this section is based on *Recycling Roles and Responsibilities Final Report*, *op. cit.*, Appendix E.
- <sup>30</sup> See for example, Resource Integration Systems, *Preliminary Metro 3Rs Strategy Draft Report* (Toronto: Municipality of Metropolitan Toronto, 1996); Sound Resource Management Group inc., *The Ministry of Environment and Energy's Draft Greater Toronto Area 3Rs Analysis: Review, Critique and Waste Diversion Potential Assessment*, 1994.
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- <sup>45</sup> Ibid., p. 18.
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- <sup>58</sup> *Environment Information* (Toronto: Province of Ontario, Winter 1992).
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<sup>73</sup> *A Preliminary Analysis of the Costs of Alternative Approaches to Solid Waste Management for the Greater Toronto Area, 1993.*



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**TOWARD A NEW ENERGY STRATEGY**

By Suzanne Elston

Prepared for

The Environmental Agenda for Ontario Project

March 1999

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## SUMMARY

*We will head in the direction in which we look.*

*Gene Roddenberry*

### **Current Status**

Our energy demands are putting a serious strain on our resources, our environment and our economy. These demands essentially come from two sectors: electricity production and transportation.

Within the electricity sector, there are dramatic changes on the horizon. The passage of Bill 35 and the opening of the electricity market to competition will provide a window of opportunity unparalleled in this province's history. The ending of Ontario Hydro's generation monopoly marks the beginning of a new era of energy diversification. This restructuring comes at a critical juncture.

Coupled with the freedom of open market comes the challenge of the climate change targets reached in Kyoto. While traditional energy producers may see these targets as restrictive, what they provide for green energy producers is both leverage and opportunity.

Changes within the transportation sector are not as forthcoming. At present, 27% of our total greenhouse gas emissions come from the transportation sector. While new technologies in engine design and fuel sources are promising, the pollution free car is not yet ready for broad market distribution. Meanwhile, our dependence on the automobile is ever increasing. There are six million cars on the road in Ontario today. By 2005, that number will exceed seven million.

### **Causes of Problem**

In both energy sectors, the greatest impediment to establishing a sustainable energy future is the lack of a level playing field. In neither case are the real impacts considered in the cost. For example, the health impacts of the burning of fossil fuels for transportation and electricity production are not considered part of the price. The cost of nuclear power can never be fully estimated until the issue of long-term waste disposal is settled.

Despite the introduction of Bill 35, the ratepayers of Ontario will continue to subsidize Ontario Hydro's massive investment in nuclear power through a competition transition charge. This charge will be applied to electricity customers and generators to recover Ontario Hydro's excess stranded debt. This will make Hydro's nuclear plants falsely competitive while penalizing newer, more sustainable types of generation, where the true future of energy production lies.

*Toward a New Energy Strategy*

In the transportation sector, inadequate legislation and government subsidies continue to favour private transportation over public. The decentralization of our cities means that more vehicles are travelling greater distances every year, while government cutbacks are limiting access to adequate public transportation.

### **Agenda for Change**

The stage is set to prove what environmentalists have always known: sustainable, green energy sources are both cost effective and environmentally sustainable.

Rather than creating a free market system where anything goes, a truly sustainable future can be realized through the careful creation of a balanced, well-legislated system that creates a level playing field for all energy sources. Government subsidies, tax incentives and funding should be equal, open and based on a full-cost accounting of all environmental and economic factors.

### **Key Recommendations**

The province should immediately remove loan guarantees for Ontario Hydro. Pickering A and Bruce A should not be re-started. Pickering B, Bruce B and Darlington should be phased out at the time when major rehabilitation is required (i.e., fuel channel replacement, steam generator replacement - at the 20 to 30 year time period.)

The province should establish a Renewable Portfolio Standard (RPS) that applies to all market participants, both within the electricity pool and through bilateral contracts. The standard should require 5% of electricity sales from new renewables starting in 2000, rising by an additional 1% per year through 2011. Electricity generators must provide full disclosure regarding the source, emissions and cost of their electricity.

The province should institute changes in the tax system to encourage the use of public transit and discourage the use of the private automobile for commuting. Employer-provided transit passes should be classified as a tax-free benefit and employer-provided free parking should be classified as a taxable benefit.

Expansion of highways should only be considered when they are the least cost solution for providing high quality transportation. This means the benefit of road improvement should be weighed against the benefits of improving public transit or expanding rail service.

Author:

Suzanne Elston is a freelance writer and researcher. Her weekly environmental column is self-syndicated in Ontario and her radio commentary can be heard regularly on public radio stations throughout the Great Lakes Basin. She is currently serving her second term as public utilities commissioner for the Municipality of Clarington and has been a steering committee member of Nuclear Awareness Project for over a decade.

Acknowledgements:

The author would like to acknowledge the significant contributions made to this paper by Tom Adams, Greg Allen, David Argue, Alan Bangay, Jake Brooks, Peter Bursztyn, Louise Comeau, Shirley Farlinger, Jack Gibbons, Bob Gibson, Sharon Gow, Karen Gventer, Wendy Heron, Greg Jenish, Ziggy Kleinau, Irene Kock, David Martin, Paul McKay, Ray Metcalfe, Ralph Torrie, Hubert Vogt, Barbara Wallace, Mark Winfield and Elizabeth Wharton.

Special thanks go to John Jackson for his patience.

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## TOWARD A NEW ENERGY STRATEGY

### INTRODUCTION

The chaos that ensued after the ice storm of '98 was a chilling example of how dependent we are on a centralized energy system. It has become as essential to our survival as the air that we breathe and the water that we drink. Transportation, communications, heating, cooling, lighting, education, health, our food supply, water and even public safety, are all dependent on a steady supply of cheap, reliable energy.

While electricity consumption has remained fairly stable over the past five years <sup>1</sup> the economic and environmental costs have increased dramatically. This is primarily due to the unreliability of nuclear power. In order to replace the nuclear generating capacity lost when seven of Ontario's reactors were shut down in 1997, the province has had to rely on coal and oil generation. The result is a staggering 47% increase in air pollution during the first six months of 1998, compared to the same period in 1997. <sup>2</sup>

With the passage of Bill 35, the *Energy Competition Act*, 1998, comes an open and competitive electricity market. The ending of Ontario Hydro's generation monopoly will allow for energy diversification, although this is limited. Most of the government's statements on Bill 35 are focused on achieving low-cost energy for the consumer. <sup>3</sup>

Price is only part of the equation. It's critical that market freedom not be seen as a licence to pollute. The environmental impact of Ontario Hydro's nuclear shutdown has already demonstrated that importing cheaper, dirty coal-generated electricity from the U.S. will further increase air pollution in this province.

Our current patterns of consumption and production are not sustainable. We need to find a way to meet our energy requirements while protecting human health and the environment. With this in mind, a new energy strategy for Ontario should be based on three basic goals: decentralization, simplification and diversification. Centred in each of these goals is accountability, not just in economic terms, but in a full social and environmental context. These goals can only be achieved through the establishment of an equitably legislated market that removes the old barriers while creatively providing new incentives for sustainable energy.

### ELECTRICITY

#### EFFECTS

*Humanity is conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to global nuclear war.*

*The Changing Atmosphere Conference, 1988<sup>4</sup>*

## **Fossil Fuels**

The burning of fossil fuels to generate electricity, run our factories and power our vehicles is having a dramatic impact on the concentration of greenhouse gases in the atmosphere. The global impact of this increase can be seen in more frequent and severe droughts, floods, storms, heat waves and other climate extremes. The terrible forest fires that raged for weeks across the northern parts of Ontario and Alberta during the Spring of 1998 were caused by changes in precipitation. Last winter's ice storm, and the tremendous flooding of the Red River Valley and the Saguenay in 1997 are also indicators of dramatic changes in the weather.

In response to the threat of climate change, world leaders gathered in Kyoto, Japan in December 1997, and agreed to reduce greenhouse gas emissions 6% below 1990 levels during the period 2008 to 2012. While world leaders were busy commending themselves for reaching any agreement, climate experts pointed out that in order to stabilize CO<sub>2</sub> levels in the atmosphere, we would have to cut our emissions by 50%.

Power generation also accounts for nearly two-thirds of sulphur dioxide emissions, a major contributor to smog and acid rain. In addition, the release of persistent toxic substances such as mercury, lead, cadmium and arsenic, as well as land degradation from strip mining are all by-products of our dependency on fossil fuels.

## **Economic Implications**

The long-term costs associated with climate change are staggering. In 1996 alone, extreme weather in Canada caused \$1.5 billion in property damage and an addition \$3 billion in indirect costs and lost revenue.<sup>5</sup>

Globally, the economic losses from natural catastrophes has jumped from \$5 billion U.S. during 1965 to 1969 to \$213 billion during 1990 to 1994 (corrected to 1992 U.S. dollars).<sup>6</sup>

A 1998 study commissioned for the province, which forecasts the health costs to the province if air pollution remains at current levels, suggests that the total cost to the Ontario economy by the year 2015 will range from \$398 million to as much as \$1.2 billion.<sup>7</sup>

Acid rain has an estimated \$1 billion impact on forests, tourism and agricultural industries in Eastern Canada alone. Health and aboriginal resettlement costs could be even higher.<sup>8</sup>

## **Nuclear: No Solution to Climate Change**

*Nuclear power, in itself, does absolutely nothing to reduce greenhouse gas*



*emissions. It's a cynical gambit on the part of the nuclear industry to save itself from being phased out.*<sup>9</sup>

*Irene Kock, Nuclear Awareness Project*

Even before the Kyoto agreement was signed, the Canadian Nuclear Association (CNA) began its campaign to promote nuclear power as a solution to climate change. On November 26, 1997, a series of CNA sponsored advertisements in newspapers across Canada stated that nuclear power "must be an integral part of the solution developed at the Kyoto Conference."

The nuclear option would satisfy no one but the nuclear industry itself. When nuclear is used for base load generation, fossil generation is needed to meet daily and seasonal peaks in addition to covering for poor nuclear performance and outages. Using fossil generation to compensate for the shutdown of seven of Ontario Hydro's nuclear reactors has increased air pollution 47% in the first half of 1998 as compared with 1997.<sup>10</sup>

Nuclear power is neither clean nor safe. Radioactive emissions are air pollution just as much as sulphur dioxide, carbon dioxide and nitrous oxide. The International Joint Commission has urged that radioactive emissions be included with other persistent toxins for virtual elimination. The health impacts of the entire nuclear fuel chain, from the mining of uranium, to the routine release of radionuclides from power plants, both during operation and post-closure, must also be considered.

Tritium releases have been a particular cause for concern for residents who live within the immediate area of nuclear plants. Tritium levels in drinking water downstream from nuclear facilities are consistently elevated above background. In 1994, the Advisory Committee on Environmental Standards (ACES) recommended that the standard of 40,000 Bq/l in drinking water be immediately changed to 100 Bq/l and then dropped to 20 Bq/l over the next five years. The government responded in December 1994 by lowering levels to 7,000 Bq/l.<sup>11</sup>

Last year it was discovered that radiation isn't the only harmful substance being released by Ontario's nuclear power plants. Over the past 25 years, corroding brass condenser tubing in the cooling units have discharged 1,183 tonnes of copper and zinc into the lakes adjacent to the Pickering and Bruce plants.

Another problem facing Ontario's nuclear plants is their declining capacity. Ontario Hydro's current Nuclear Asset Optimization Plan (NAOP) has assumed a potential 86% capacity factor. This is both unrealistic and unattainable. The average nuclear capacity has declined from 80% (1980 to 1983) to 70% (1984 to 1989) to 65% (1990 to 1996). CANDU performance is now the worst in the world among major competitive reactor designs.<sup>12</sup>

### **Economic Implications**

Although Ontario Hydro continues to assume a 40-year life span for its nuclear reactors, Pickering A and Bruce A were shut down after only 25 years of service. Hydro considers these shutdowns temporary and plans to invest \$22 billion in a nuclear recovery program through to 2009. Of that, \$8.4 billion will be spent before competition is introduced in 2000. The \$22 billion total does not include replacement power costs of \$3.014 billion for increased use of coal stations between 1997 and 2003.<sup>13</sup>

Separate from NAOP is the issue of Ontario Hydro's debt. According to Ontario government estimates, construction cost overruns on nuclear plants has driven Ontario Hydro's accumulated debt and other liabilities to \$39.1 billion. A net asset worth of only \$15.8 billion leaves the utility with a stranded debt of \$23.3 billion.<sup>14</sup> It is not clear how, or to what extent, the estimated \$18.7 billion required for fuel management and reactor decommissioning is included in this figure.<sup>15</sup>

Budgeting is not the only problem that Ontario Hydro faces with regard to high level waste. Many of the radioactive components of spent nuclear fuel will pose a threat for thousands of years. For example, the most long-lived actinide component, Plutonium 242, has a half-life of 387,000 years.<sup>16</sup>

### **Waste and Resource Use for a single CANDU fuel bundle.\*<sup>17</sup>**

Uranium mining	mine site = 70m <sup>2</sup> mine effluent = 3,000 litres
Uranium milling	weight of tailings = 12 tonnes volume of tailings = 9m <sup>3</sup> 120MBq of each <sup>238</sup> U decay product leach ate carries 0.2-1.6 Bq/ <sup>1226</sup> Ra
Reactor cooling water	180 million litres
Airborne reactor emissions	36,000,000,000 Bq tritium oxide 28,000,000,000 Bq.MeV noble gases 2,400 Bq iodine 131 29,000 Bq particulates
Waterborne reactor emissions	80,000,000,000 Bq tritium 1,600,000 Bq gross beta
Low and intermediate level radioactive waste	7.6 kg
High level radioactive waste	19 kg

(\*One CANDU fuel bundle is used in a reactor for about 15 months, and produces about 1000 megawatt hours of electricity. Reactor emissions are based on total emissions during 1992, normalized per megawatt.hour. The figures for uranium mining and processing assume use of Elliot Lake area uranium with uranium content of 0.1%.)

In March 1998, a federal panel studying deep rock burial released its recommendations after eight years of public consultation and study. Instead of focusing their recommendations on the mechanics of burying our nuclear legacy deep below the surface, the panel concluded that safety is only one part of the equation. Broad public support is necessary to ensure the acceptability of a concept for managing nuclear fuel wastes. In order to gain that support, safety must be viewed from two complementary perspectives: social and technical. Given the long life of these wastes, it's highly unlikely that the public will ever be able to agree to a permanent solution.<sup>18</sup>

### **Large Hydro**

Like their nuclear and fossil fuel burning counterparts, large hydro-electric plants are expensive to build and carry significant environmental costs such as the flooding of wetlands, displacement of indigenous peoples and the destruction of natural habitat. The anaerobic decomposition of flooded vegetation produces methane, a potent greenhouse gas. There is also concern that toxic materials, such as mercury, can be released from rocks due to flooding.

The James Bay Hydro Development is a classic example of how big hydro creates big problems. The initial cost estimate of 1 billion dollars in 1970 rose to 15 billion by 1982. This has translated into a quadrupling of Quebec electricity rates, 45% of which goes to pay down Hydro Québec's debt.<sup>19</sup>

The timelines for constructing these giants are also colossal, with corresponding cost overruns, which further add to their multi-billion dollar price tags. Another disadvantage of the long timelines is the fluctuating energy market and the inability to accurately pinpoint market growth. Large hydroelectric installations also have major impacts on wildlife, wetlands and wilderness.

### **Green Energy Goals - EFFECTS**

It is clear that the existing financial and socio-environmental costs of producing power are far too high. In order to mitigate these impacts, we must immediately:

reduce greenhouse gases emissions,  
reduce sulphur dioxide, nitrogen oxide and air toxic emissions, and  
phase out nuclear and coal generating facilities.

### **Recommendations:**

1. The Government of Ontario should implement greenhouse gas emissions caps for both electricity generated within the province and imported to Ontario that will reduce greenhouse gas emissions 10% below 1990 levels by 2005. This exceeds the Kyoto target of 6%.

2. Provincial sulphur dioxide emission caps should reduce sulphur dioxide emissions 75% from the existing 175 kilotonnes per year to 43.75 kilotonnes, as recommended by the Acidifying Emissions Task Group.<sup>20</sup>
3. The Ontario government should put nitrogen oxide caps in place to reduce emissions to below 38 kilotonnes per year.
4. The Ontario government should put regulations in place to assure the virtual elimination and effective zero discharge of any emissions such as mercury, lead, cadmium, arsenic, hexavalent chromium, nickel, polyaromatic hydrocarbons and particulates that are identified as persistent toxic substances, as per the International Joint Commission's recommendations.<sup>21</sup> This includes any radionuclides that meet the definition of persistent toxic substances.<sup>22</sup>
5. The risk associated with fluoride emissions from the utility sector should be clarified, and an appropriate course of action taken.<sup>23</sup>
6. The province should remove loan guarantees for Ontario Hydro. Pickering A and Bruce A should not be re-started. Pickering B, Bruce B and Darlington should be phased out at the time when major rehabilitation is required, i.e., fuel channel replacement, steam generator replacement - at the 20 to 30 year time period.
7. The province should require Ontario Hydro to establish an actual fund, under independent control, to pay for future costs of reactor demolition and long-term waste management, as opposed to the virtual fund established by Ontario Hydro.
8. The province should adopt the tritium drinking water standard of 100 Bq/L recommended by the Advisory Committee on Environmental Standards (ACES). The province set Bq/L. the current standard of 7,000 in December 1994, down from a previous standard of 40,000 Bq/L.<sup>24</sup>

## CONSUMPTION / DEMAND

*Focusing private and public policy on barrier-busting can permit businesses to buy energy savings that are large enough to protect the climate, intelligent enough to improve living standards, and profitable enough to strengthen economic vitality, employment and competitiveness.*<sup>25</sup>

*Amory & Hunter Lovins*

Our economy is driven by large, multinational corporations whose survival depends on the consumption of everything from energy to consumer goods. Ontario Hydro, the largest public utility in North America, currently holds the monopoly to supply our

electricity needs. In order to meet these needs, Hydro has encouraged consumption to finance the construction of large generating facilities.

It's not surprising then that, despite the vast body of evidence that conservation and efficiency measures work, our society has failed to fully grasp the idea of demand management. These are, in effect, non-products, which are difficult to sell in a consumer-based society. Conservation and efficiency need to be regarded as the vehicles to establish a more transparent energy economy. To paraphrase Amory Lovins, rather than focusing on supplying energy we need to look at the services that energy provides.

In order to accomplish this, a dramatic paradigm shift is required. The general perception is that we must do these things in order to salvage what's left of our future from the ravages of climate change, pollution and resource depletion. Furthermore, as participants we are driven by the unspoken fear that if we stop consuming, the economy will collapse. This is not only counterproductive; it's down right depressing. As Greg Allen so eloquently put it, "How can we be excited when the best that is offered is to slow our rate of demise?"

This shouldn't be a depressing process. It is truly an opportunity to shape the future - an opportunity that is presented by the restructuring of Ontario Hydro and the need to comply with greenhouse gas reduction targets. Furthermore, the economy will not collapse if we stop consuming at the current rate, but it will change into a more sustainable, less centralized form.

For the green community, the question of lost jobs as a result of changes in energy policy, particularly in the nuclear sector, has been difficult. Labour and environment have traditionally had a supportive relationship but calling for the shutting down of Ontario's nuclear plants, for example, is perceived to threaten thousands of jobs.

In reality, nuclear reactors would be phased out over time, thus allowing for attrition in the workplace. Once the reactors have been shut down, there will be many jobs in the decommissioning process as well as maintaining the site in a safe condition. Workers from older plants will also be transferred to newer facilities. For example, displaced workers from the Bruce plant are already being re-located to Darlington.

In addition, the province should institute a skills re-training program in sustainable energy practices and turn nuclear workers into renewable energy experts. Coupled with this could be the creation of renewable energy projects, which would help re-energize the local economy while providing sustainable employment.

A truly green energy strategy goes far beyond electricity. All aspects of energy consumption, including heating and cooling, transportation, infrastructure, shipping and manufacturing are all part of the energy picture. We need to examine the end-use of energy needs and apply the most appropriate, conserving efficient tool to get there.

Our goal is to convince the provincial government and the public that a green energy strategy is not only feasible, but also it will enable us as a society to transcend our existing economy into a truly sustainable one.

#### **What Energy Efficiency Can Do:**

**"Efficient lighting is not just a free lunch; it's a lunch you are paid to eat."**

\* Since 1979, the cost to heat government buildings has dropped 25%. By the year 2000, it is expected that energy renovations will have provided the private sector with contracts worth \$60 million that will lead to annual energy savings of \$12 million. Accordingly, the annual return on investment is expected to be 20%.

\* A \$7.5 million compact-fluorescent lamp factory saves as much electricity as a \$1 billion power plant makes, while avoiding the plant's fuel costs and pollution. Net capital saving? A cool \$992.5 million.

\* If the City of Toronto were to exercise demand management retrofits at cost-effective levels, it could reduce its electrical load by at least 50%.

\* Standard incandescent lights are really tiny space heaters that just happen to give off a little light: over 90% of the energy they use ends up as heat. Often, this heat has to be removed by an air conditioner, wasting yet more money. Replacing incandescent lamps with efficient compact fluorescent lamps (CFLs) lowers utility bills and reduces cooling loads. CFLs last five to thirteen times longer than incandescents and save \$30 to \$50 in energy bills over their lifetime.

#### **Green Energy Goals - CONSUMPTION/DEMAND**

Energy efficiency doesn't cost - it pays. The first priority is to remove the market barriers that have created an uneven playing field. The second is to create a well-educated consumer who understands the choices available. In order to accomplish this, we need:

a fully regulated system where all costs associated with energy consumption are reflected in the consumer price,  
public awareness of the economic and environmental benefits of energy efficiency programmes, and  
recognition of obsolete technologies and the re-training of related workers in sustainable fields.

#### **Recommendations:**

*Toward a New Energy Strategy*

1. Ontario's municipal utilities and other energy service companies should aggressively act on the promotion of energy efficiency services by performing energy audits, installing energy efficient devices and providing information to customers on how this will reduce their electricity/energy costs.
2. The province should provide full funding for all Green Communities Programs to perform energy audits and for teams to help homeowners and businesses install energy efficient equipment (perhaps a co-operative arrangement with public utilities - See Recommendation #1).
3. Aggressive energy efficiency standards should be put into the provincial building code.
4. A Builder Tax Credit should be provided to builders who install photovoltaic panels instead of standard roofing on new homes. (Benefits: cheaper energy costs for homeowners, increased volume in photovoltaic sales will bring down unit costs, higher re-sale value for homes.)
5. Provide tax incentives for any commercial or residential retrofits that would allow a full-cost write-off after three years.
6. Utilities should replace block rates with equal billing per kWh of electricity consumed. Small concessions could be made to businesses/industries who have a portion of their electricity supplied as interruptible power.
7. The province should develop curriculum materials for schools that integrate the concepts of pollution prevention, energy conservation and efficiency.
8. Through its community college system, the province should establish an energy efficiency job re-training programme for workers displaced by obsolete technologies.
9. Utilities should establish a high-use penalty rate for residential consumers, based on size of homes.

## **PRODUCTION**

*Given that energy is the most polluting sector of our economy, it follows that the introduction of energy efficiency and independent power also represents the greatest single opportunity for environmental protection.*

*Jake Brooks, Executive Director,  
Independent Power Producers' Society of Ontario*

Large generating facilities, whether they be nuclear, fossil fuel or hydroelectric are no longer an acceptable option. They are capital intensive, have long-term environmental impacts and require years, or even in some cases, decades of planning and construction. Cost overruns have created a \$23.3 billion stranded debt<sup>26</sup> that will be carried by the ratepayers of this province.

Ontario Hydro's existing monopoly on power generation and the provincial subsidies of Hydro's facilities has trapped us into the bigger is better mentality. Fortunately, the flexibility and speed required to respond to the coming open market will render any plans to build new mega-projects obsolete.

In practical terms, our dependence on large hydro has put all our energy eggs in two or three baskets. When one of these energy sources fails, the bulk of our supply is wiped out. This is referred to as common mode failure. For example, prior to the shutdown of seven reactors last year, 60% of Ontario's electricity came from nuclear. To compensate, Hydro has been using fossil fuel generation. The result has been a 47% increase in air pollution from the first half of 1997 to the same period in 1998.<sup>27</sup>

Where we need to be operating from is a system of self-sufficiency. With a diversified energy base, the energy needs of the province could be met without sacrificing the environment or reliability. Local generation will also safeguard against catastrophic events, such as last winter's ice storm. In such a case, service can more readily be restored on smaller distribution systems. The establishment of small-scale, decentralized power will eliminate future calamities.

*We resolve never again to be dependent on a single power source.*

*Cindy Barrett, ice storm survivor*

Our energy future then, lies with a decentralized and diversified base of renewable power sources that utilizes gas-fired co-generation plants as a transition technology.

Renewable energy sources are perfectly priced to achieve the desired long-term goal of sustainable, environmentally responsible energy production. There are virtually no latent downstream costs related to pollution or environmental degradation. In the case of solar, wind and water, there are no direct fuel costs.

Over the long term, renewables make good investments. Unfortunately, because most of the costs related to renewables are up front, they cannot currently compete with subsidized producers. Current direct federal expenditures on the energy sector are close to \$700 million, with only 5% of that going to research and development on alternative energy. Other federal assistance to the energy sector adds up to about \$1.9 billion per year.<sup>28</sup>



On April 15th, 1997, Ontario Hydro agreed to subsidize Domtar in return for its agreement to not self-generate at its Packaging Facility in Red Rock for five years. In October, 1997, Ontario Hydro's board approved a deal to supply Shell Canada Products Limited with subsidized power in return for Shell's agreement to shelve its self-generation plan for three years. This is despite the fact that industrial self-generation is usually at least twice as energy efficient as comparable Ontario Hydro's generation and reduces demands on the Provincial grid. These subsidies are being given at the expense of Ontario ratepayers at a time when Hydro has to import energy to compensate for lost production at its nuclear facilities.<sup>29</sup>

With the government's focus on achieving low-cost energy for the consumer,<sup>30</sup> it will be difficult for renewable projects to get established. The answer to creating an equitable market would be to adopt a renewable energy portfolio standard that would guarantee renewable producers a share of the market, while eliminating subsidies to large producers. Long-term contracts for renewable producers will provide the financial security necessary to make them financable. Regulation would be required to ensure that production was indeed renewable. Power sources would have to be identified to allow the consumer to make green energy choices.

### **Transition Technologies**

*Significant reductions in electricity-related emissions can be achieved, at no net cost to consumers, by investing in energy efficiency and by end-use fuel switching from electricity to natural gas.*

*Jake Brooks, Executive Director,  
Independent Power Producers ' Society of Ontario*

### **Cogeneration**

Using high-efficiency gas turbines in conjunction with heat recycling makes cogeneration the most efficient use of fossil fuels for power generation. Utilizing the heat that is normally rejected by a power generating system to produce steam for an industrial process, or as hot water for space heating, produces conversion efficiencies of more than 80%. This compares with only 30 to 40% for a conventional power generating system, which releases heat directly into the environment.<sup>31</sup>

Cogeneration is not a renewable technology, but rather a transition solution, which will enable the province to move quickly from large, heavily polluting sources of energy to sustainable ones.

### **District Energy (Heating & Cooling)**

District heating refers to any system where the energy for more than one building comes from a central plant. This can include heating, cooling and electricity from a variety of fuel sources. Generally, district heating is less expensive to build and to operate. District

heating systems are approximately 40% smaller than the aggregate capacity of individual systems. They improve air quality and are energy efficient.<sup>32</sup>

The primary drawbacks to district heating are legislative. A greater level of coordination between builders, utilities and government is required to make this application more widespread. In addition, there is a tax prejudice against district heating. The Canadian tax system only allows a 4% depreciation rate, which is much slower than the depreciation rate allowed on competing energy investments.<sup>33</sup>

### **What is Green power?**

There has been considerable debate over what constitutes green energy. Proponents of nuclear power, for example, consider it green because it doesn't directly produce greenhouse gas emissions. While large hydro plants are considered to have considerable environmental impacts, small hydro projects are generally felt to be an acceptable renewable source.

While a consensus on this issue has yet to be reached, the federal Environment Choice Program's standards for alternative source electricity generation are being used by the various stakeholders as the baseline definition for renewable power.

Renewable energy sources are derived from those natural, mechanical, thermal and growth processes that repeat themselves within our lifetime and may be relied upon to produce predictable quantities of energy when required.

#### Alternative Source Electricity Generation Certification Criteria:

Alternative source electricity generation must be generated by one of the following alternative source technologies:

- \* solar technologies (e.g., photovoltaics, solar water and air heating, specific building designs),
- \* water technologies (e.g., generation of 20 MW or less\*\*, run-of-the-river facilities, including advanced micro-hydro facilities),
- \* wind technologies (e.g., turbines such as individual or small to medium wind farms),
- \* gas recovery from sewage or landfills, and
- \* other technologies that use media such as hydrogen, compressed air or fuel cells to control, store and/or convert renewable energy.

\*\*( It is expected that this standard will be increased to 80 MW by Spring1999)

## **Renewables:**

### **Small Hydro (run-of-the-river)**

Small hydro is generally defined as power generated by falling water at an average capacity of 20 MW or less. Unlike their larger cousins, small hydro installations are much less likely to cause environmental disruptions such as the flooding of low-lying lands. They don't result in atmospheric emissions or hazardous waste. Small hydro installations have proven to be durable, highly reliable and dependable and can often be used for such secondary purposes as flood control and fish breeding. Small hydro projects that use pipes rather than dams to direct water to their turbines are called run-of-the-river projects. Because they require no dam construction, they tend to be cost-effective and environmentally acceptable.

### **Biomass**

The burning of natural source fuels such as wood, straw or agricultural by-products can be used to generate power, or in a cogenerative application for both heat and power. Using refuse fibres for fuel, biomass helps reduce the release of methane, a potent greenhouse gas into the atmosphere, while replacing the need for non-renewable fuels.

The key to neutralizing the release of carbon dioxide from combustion into the atmosphere is to ensure that new plants are grown to absorb the amount of CO<sub>2</sub> released by the biomass that is burned. In Sweden, for example, fast growing birch groves are grown in seven-year rotation. The one to six year-old saplings absorb the carbon released when the seven year-old trees are burned.

### **Wind Energy**

Canada is one of the five nations of the world that could theoretically derive all its electricity needs from wind, according to The Worldwatch Institute.<sup>34</sup> In Ontario, the shores of four of the Great Lakes have many proven high velocity wind sites.

The latest improvements and integration of new electronic controls have made wind turbines cost-competitive with nuclear and fossil fuel generation, even without taking externalities into account. A 600 kW wind turbine like the Tacke Test Turbine near Kincardine can satisfy the needs of 160 homes. Small, natural gas-fired generators could be used to make up for low wind conditions.

A major benefit of using wind turbine plants is that they can be built within nine to twelve months and close to the locations where power is consumed, thus cutting transmission losses by up to 10%. Ontario Hydro's Renewable Technology Program proposed that Ontario's 973,00 rural retail customers could be given the choice of installing their own wind/solar hybrid generating systems with back-up power being supplied by the grid.

The Canadian Wind Energy Association estimates that the development of a Canadian wind energy industry that generates \$200 million annually in sales would create more than 3,000 jobs and displace at least one million tonnes of greenhouse gas emissions annually.

### **Solar**

Solar power is our most direct renewable energy source. The key to widespread use of solar power is in consumer demand, which brings prices down and productivity up, ultimately creating thousands of long term, sustainable jobs.

The most economical use of solar is in direct heating applications such as thermal water heaters.

The photovoltaic (PV) process involves sunlight striking silicon particles, which when bombarded with photons, give off electrons to create an electrical charge. This technology has been rapidly improved to the point where PV panels have reached efficiencies of up to 37%.<sup>35</sup>

The cost of solar power has dropped 95% over the last 25 years, but even lower costs are possible. A 1997 study by British Petroleum (BP) indicates that solar photovoltaic panels can be made cost-competitive with coal and nuclear electricity using existing technology. A factory that produces 500 megawatts of photovoltaic panels annually would create 3,000 jobs.<sup>36</sup>

Solar tiles, another evolving technology, are being developed to replace standard roofing tiles and should be on the market shortly.

The Kortright Centre for Conservation in Woodbridge is an excellent example of how small, diverse solar installations can create a sustainable energy system. A 4-kilowatt grid is connected to a PV system that supplies electricity to run the wastewater treatment facility. Inside the treatment facility, a solar hot water system provides hot water for domestic use and radiant floor heating.

The renewable energy cottage has a modest 500-watt system made up of 300 watts of PV and 200 watts of wind. The Kortright Centre also boasts Canada's first solar PV single system. It generates 800 watts and is connected to Ontario Hydro's grid.<sup>37</sup>

### **Hydrogen**

Hydrogen, produced by passing an electrical current through water, can be used to store solar energy and regenerate it when needed for nighttime energy requirements. It can be burned to produce heat or passed through a fuel cell to produce electricity.<sup>38</sup>

### **Landfill Gas**

Unlike other renewables, which are essentially environmentally neutral, landfill gas facilities actually help improve the environment. Producing energy from landfill gas improves local air quality, eliminates a potential explosion hazard and reduces greenhouse gas emissions to the atmosphere. Landfill gas is about 50% methane,<sup>39</sup> and accounts for 26% of Canada's total anthropogenic methane emissions.<sup>40</sup> Methane is a potent greenhouse gas, with 21 times the global warming potential of CO<sub>2</sub>.<sup>41</sup>

Landfill gas applications are particularly well suited for district heating because of their ability to produce power approximately 80% of the time. Using landfill gas to generate electricity displaces fossil fuels, which further reduces emissions.<sup>42</sup>

With all the associated benefits, landfill gas facilities should become as mandatory a part of landfill design as installing liners and providing for groundwater monitoring.

At present there are a number of landfill gas facilities producing electricity for Ontario Hydro's grid. Eastern Power's facility at the Brock West landfill generates 27 megawatts, and second plant at Keele Valley produces 12 megawatts. Energen Cogen's facility at the Beare Road site in Scarborough generates 3 megawatts. A four-megawatt plant under development by Toromont at the Kitchener-Waterloo landfill is expected to go online in 2000. In addition to these facilities, a study by the Ontario Ministry of Energy estimates that there is potential for another 70 megawatts of generating capacity around the province.<sup>43</sup>

#### **Municipal Anaerobic Digestors**

Even more effective than landfill gas facilities is the centralized, anaerobic digestion of wet waste. Wet waste is removed from the solid waste stream. While the solid stream is mined for recyclables, the wet stream is processed to produce a biogas with a high methane content. The biogas can either be pressurized and then sold to gas vendors, or combusted on-site for use in co-generation. The remaining organic material can be used as compost. This same technology has application for the agricultural community with the anaerobic digestion of animal wastes.<sup>44</sup>

Eastern Power is currently working with The City of Guelph to augment the city's wet-dry garbage system. The goal is to reduce the amount of waste still going to landfill from the facility. Company officials ultimately hope to process 25,000 tonnes of solid waste while generating electricity. The project will begin sometime in 2000.<sup>45</sup>

Other biogas options include utilization of sewage gases to produce both heat and methane for electricity generation at some sewage treatment plants.

**(INSERT "The Economic Cost of New Generation" chart here.)**

## **Green Energy Goals: PRODUCTION**

In re-designing our energy future, renewables provide an exciting opportunity to provide sustainable, affordable, clean power to the province. This can be initiated by:

the transfer of all grants, subsidies and tax benefits from non-renewable, unsustainable sources of energy to the renewable energy sector, and  
the establishment of a sustainable, economically and environmentally responsible decentralized energy system for the province.

### **Recommendations:**

1. Ontario Hydro should immediately be forced to cancel any existing self-generation agreements (co-generation avoidance rates), such as those with Domtar and Shell Canada, and companies should be encouraged to install self-generating facilities through tax incentives, such as full-cost write-offs over a period of three years.
2. Electricity generators must be required by the province to provide full disclosure regarding the source, emissions and full cost of their electricity.
3. Fuel switching for end-use application such as from electricity to solar for water heaters and from electricity to natural gas for home heating should be promoted.
4. Tax incentives and other subsidies to the fossil fuel industry should be eliminated. Realized revenues should be redirected to encourage the development of innovative energy producing technologies.
5. Additional tax incentives should be introduced to promote the development of environmental technologies, innovations such as district heating energy systems, co-generation and renewable energy sources, including tax rebates/incentives for switching to renewable sources
6. The various provincial government departments should coordinate their efforts to encourage district-heating systems.
7. A provincial regulation should require that landfill gas facilities become a mandatory part of all new landfill design.
8. The Ontario government should adopt the Canadian Wind Energy Association's targets of:

the installation of at least 500 MW of wind generated electricity capacity by the year

2000, and at least 5,000 MW by the year 2010,  
the installation or export of 15,000 wind powered water-pumping systems by the year  
2000, and  
the installation of 2,500 micro-wind systems by the year 2000.

## GOVERNMENT POLICY

### The Restructuring of Ontario Hydro

The passage of the *Energy Competition Act* or Bill 35 has finally provided a legislative vehicle for the changes needed in Ontario's energy sector.

Of key importance is the government's goal to ensure that greater competition will not threaten environmental protection in the province. In order to achieve this, the restructuring Bill will amend both the *Environmental Protection Act* (EPA) and the *Energy Board Act*.

Legislative changes will include proposed pollution disclosure requirements that will enable consumers to make sustainable energy choices. They will also include emission performance standards (EPS) that will define maximum emissions levels per unit of electricity generated. In other words, only those sources that meet acceptable environmental standards will be allowed to sell electricity in the province, unless they purchase credits from other generators whose emissions are well below EPS.

While the intent of the legislation is to create opportunities for more efficient and environmentally benign technologies, unfortunately it doesn't level the playing field. The establishment of a renewable portfolio standard (RPS) that will provide a guaranteed share of the market for sustainable energy technologies should be introduced.

Bill 35 will require generators, wholesale suppliers and retailers to report to both regulators and consumers the nature of their electricity supply. Although this environmental labeling will tell consumers what percentage of the various types of power they are buying, it will not tell them what the impact associated with each type of generation is. A more progressive label would include both a percentage and an environmental rating.

The legislation is also geared at maintaining existing emissions limits, where they exist, rather than setting aggressive new reduction targets. The province should follow the lead set by the City of Toronto's Clean Air Initiative, which hopes to reach a 20% reduction in carbon dioxide emissions by the year 2000.

The current Ontario Hydro structure will be replaced by three entities: the Ontario Electric Generation Corporation (OEGC), which will include all nuclear, fossil and hydraulic generating capacity; the Ontario Electric Services Corporation (OESC), a holding company consisting of the transmission network, the retail system and Ontario Hydro International and Ontario Hydro Technologies; and the Independent Market Operator (IMO), which will manage both the physical and market aspects of electricity exchange in the new system.



To aid the transition process, the government has formed two consultative committees, the Market Design Committee (MDC) and the Transition Committee. In addition to the stranded debt and the promotion of energy efficiency and environmental regulations, these committees must deal with the rules for the interim market for replacement power, legislation for the new electricity structure, and the restructuring of the municipal electric utilities (MEUs).

### **Stranded Debt**

After much speculation, on October 26th, 1998, the Ministry of Finance announced the stranded debt figure for Ontario Hydro was \$23.3 billion. This figure was estimated based on assessing Hydro assets at \$15.8 billion, and its debts and other liabilities at \$39.1 billion.<sup>46</sup>

Although this debt is largely the result of Hydro's huge investment in nuclear power plants,<sup>47</sup> it is being restructured so that the burden of repayment falls on the ratepayers of Ontario - not the nuclear plants. \$7.9 billion will be paid off through a competition transition charge; the remaining \$15.4 billion will be paid off through Hydro's successor companies in lieu of property, federal and provincial taxes. On the other hand, as a result of Bill 35 the municipal electric utilities will now be required to pay revenue taxes.

It is clear that the restructuring of Ontario Hydro has little to do with real competition, and everything to do with managing Hydro's debt. Rather than creating a level playing field for all electricity producers, removing the burden of debt from the nuclear power plants makes them falsely competitive in an open market. Furthermore, the competition transition charge effectively transfers a large portion of the nuclear debt to cleaner electricity sources such as wind power or natural gas co-generation, effectively making them less competitive.<sup>48</sup>

### **Renewable Portfolio Standard**

What is missing from Bill 35 is the requirement for a renewable portfolio standard (RPS) that would require all generation companies or retail electricity suppliers to provide a specified amount of their generation sales from renewable sources. RPS can also include a secondary market in renewable energy credits, providing a flexible, market-based approach for achieving a valuable environmental benefit - the promotion of renewable energy - at the lowest possible cost. The RPS makes a logical and compatible companion for a System Benefits Charge (SBC), which is typically used to fund conservation and efficiency programmes, as well as the research, development and commercialization of new renewable energy technologies.<sup>49</sup>

### **The Role of the Municipal Electric Utilities**

Bill 35 requires that utilities split their operations into two divisions: a monopoly wires company and an energy services company that will have to compete for customers. In this new customer-driven market, utilities will have to diversify their products and services to include renewable power, conservation audits and energy efficient appliances in order to satisfy energy conscious consumers.

In September 1998, Enmax, Calgary's electrical utility, became the first public utility in Canada to offer its customers the option of buying wind power. Even before the plan was officially announced, the utility was overwhelmed with calls from customers willing to pay a premium of \$7.50 per month to direct the utility to purchase wind generated power. The premium will pay for about 125 kilowatt-hours of electricity, or about 25% of the average annual household consumption of 550 kilowatt-hours. It's expected that as wind power becomes more popular, it will also become cheaper.<sup>50</sup>

In Ontario, Toronto Hydro took the lead in July 1998, by releasing its new CO2 plan, which focuses on lowering its own energy use, educating customers, and forming new alliances with organizations committed to reducing air pollution. Under the 25-point plan, customers will have the option of purchasing renewable power. In addition, small-scale generating facilities or RETs (renewable energy technologies) of 50 kilowatts or less will be able to bank excess electricity through Toronto Hydro, which will then forward it to the grid for credit. The utility will also look at ways of improving efficiency within its own facilities and throughout its distribution system.<sup>51</sup>

### **Ontario Energy Board**

Under the changes proposed in the *Energy Competition Act*, the Ontario Energy Board (OEB) will be redesigned and strengthened to provide better protection for electricity customers. The OEB will also be mandated to regulate investments in the expansion of the transmission grid, as well as "local wires" businesses and distribution companies. The board will oversee the activities of the Independent Market Operator (IMO), and ensure that market participants don't abuse market power or engage in anti-competitive pricing or other monopolistic practices. The OEB will continue in its role as regulator for the natural gas business.

While the new strengthened role of the OEB is welcomed, its mandate could be broadened to cover the implementation of a renewable portfolio standard (RPS) and the monitoring of emissions trading within the framework of the provincial utilities.

### **Emissions Trading**

In response to the Kyoto Protocol, it is anticipated that emission reduction credits and emission permits will become part of federal and international policy. Effectively emissions trading allows producers with expensive reduction options to pay for lower priced options within other companies and/or arenas. For example, it may be cheaper to

fund the planting of trees to absorb CO2 from the atmosphere, than it would be to prevent an equivalent amount from being released through fossil fuel consumption.

There has been some concern that the cheapest, most easily attainable reductions will be purchased first, effectively driving the cost of future reductions up and the cost of electricity with it. "In addition to the public interest, there are a variety of private interests that will have a stake in how the market is set up, and these interests conflict with each other and sometimes in the public interest." <sup>52</sup>

Another issue that needs to be addressed is the quality of the reductions achieved, i.e., what's best for the environment may not necessarily be the easiest or the most economic reductions to achieve.

### **Green Energy Goals - POLICY**

Bill 35 has provided legislation for the restructuring of the electricity sector in Ontario. Unfortunately, it falls short of creating a sustainable, competitive energy future for the province. In order to achieve this, we require:

the end of government subsidies and loan guarantees for Ontario Hydro, an open system where cost and source are given equal value, a level playing field for producers and consumers, and promotion and development of renewable energy technologies.

### **Recommendations:**

1. Ontario Hydro's provincial debt guarantee should be removed immediately in order to prohibit Ontario Hydro from making further bad investments, thereby ensuring that customers and taxpayers will not have to pay for additional stranded costs.
2. The province should establish a Renewable Portfolio Standard (RPS) that applies to all market participants both within the electricity pool and through bilateral contracts. The standard should require 5% of electricity sales from new renewables starting in 2000, rising by an additional 1% per year through 2011. Electricity generators should be required to provide full disclosure regarding the source, emissions and cost of their electricity.
3. Under provisions in Bill 35, environmental labeling for consumers should include both the percentage of electricity supplied and some kind of standardized environmental impact rating.
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## TRANSPORTATION

*Transportation accounts for 31.5% of all energy used in the country, with road vehicles responsible for 81% of that share.<sup>53</sup>*

*Charles Caccia,  
Chair, Environment and Sustainable Development Standing Committee,  
1997*

Ontario is home to six million vehicles, or almost half the nation's total. The Greater Toronto area alone is currently home to three million vehicles.<sup>54</sup> On average, these vehicles emit six tonnes of CO<sub>2</sub> annually.<sup>55</sup> Natural Resources Canada forecasts that the total number of gasoline-based cars and light trucks in Ontario will reach 7.2 million by 2005. This represents an overall increase of 39.2% from the 1990 level.<sup>56</sup>

## ENVIRONMENTAL IMPACTS

### Smog and Climate Change

According to Environment Canada, the transportation sector makes up 27% of the total greenhouse gas emissions. Even with the manufacturing of cleaner, more fuel-efficient vehicles and new tailpipe emission standards, automobile emissions are expected to increase by almost 6% above 1990 levels by 2005.<sup>57</sup>

These emissions not only make a significant contribution to climate change, but three-quarters of the pollutants that combine to form ground-level ozone (the major source of smog) come from automobiles. Scientists predict that the higher temperatures created by climate change will increase the frequency and extent of urban smog. In addition, as green space is paved over to accommodate roads, the roads themselves become heat islands, which will further contribute to higher temperatures in urban areas.

The highest concentration of smog in Canada is in the Windsor to Quebec City transportation corridor, with nearly half of Canada's road emissions being generated in the Greater Toronto area. Pollutants drifting from the United States cause half of Ontario's smog problem.<sup>58</sup>

### Land Use

Building more roads only further entrenches our dependence on the private automobile and creates significant issues in land use planning. In Ontario there are already 55,000 km of highways, roads and streets. Every kilometre of highway takes up about 6.5 hectares of land. In our cities, approximately half of the urban landscape is devoted to either roadways or parking.<sup>59</sup>

Many of the materials required for road construction destroy land through aggregate mining. The use of toxic road surfaces such as Dombind, (a liquid industrial waste from pulp and paper mills, used as a dust suppressant), and the application of road salt during winter months further degrade the environment.

## **HEALTH IMPACTS**

Smog and air pollution have been linked to increased incidence of allergies, asthma, chronic bronchitis and other respiratory and heart ailments.<sup>60</sup> According to a scientific study, 2 to 4% of respiratory deaths can be attributed to pollution levels. Similar associations were observed for cardiovascular deaths.<sup>61</sup>

Data collected for the period 1983 to 1988 found a significant connection between both pollutants and daily admissions at southern and eastern Ontario hospitals. On average, 5% of hospital admissions due to respiratory problems from May to August were associated with increases in ground-level ozone. Sulphates accounted for an additional 1%.<sup>62</sup>

## **ECONOMIC IMPLICATIONS**

Registration fees, gasoline and corporate taxes cover less than 42% of the total cost of our transportation infrastructure. Ontario Government revenues from the transportation sector in 1990 were \$3.5 billion, whereas direct car-related expenditures topped \$4.5 billion, including \$20.3 million in subsidies to the auto and oil industries. Hidden costs such as loss of farmland and crop damage due to ground level ozone, loss of time due to traffic congestion and loss of productivity due to injury and death, add an additional \$3.8 billion, bringing the total to \$8.3 billion. These figures do not include the effects of global warming.<sup>63</sup>

Traffic congestion has a significant impact on the economic, social and environmental health of the province. According to Ontario government estimates, lost time due to traffic congestion costs the economy \$2 billion annually.<sup>64</sup>

It's estimated that idling is responsible for 4% of fuel consumption. While most of this waste can be attributed to sitting in heavy traffic, unnecessary idling, particularly in the winter months, is avoidable. But when the City of Toronto passed an anti-idling by-law, the Minister of Municipal Affairs disallowed the by-law, citing difficulty of enforcement and infringement on individual rights.<sup>65</sup>

## THE ROLE OF THE CONSUMER

*The car has become a secular sanctuary for the individual, his shrine to the self, his mobile Walden Pond.*

*E.C. McDonagh*

The consumer can play a significant role in lessening the environmental impact caused by the private automobile. Cutting driving speeds from 112 km/h to 80 km/h reduces fuel consumption by 30% while reducing nitrogen oxide emissions. Driving on improperly inflated tires can reduce fuel efficiency by 4%.<sup>66</sup>

In a pilot test project conducted in Mississauga, more than 20% of cars tested did not meet minimum emissions standards. Technicians found that one poorly tuned vehicle can emit pollutants equivalent to 20 other cars.<sup>67</sup>

Properly maintaining a vehicle will improve fuel efficiency, reduce toxic emissions and lower the average fuel bill by \$125 per year. If every vehicle in the province were regularly maintained, it would reduce nitrogen oxide emissions by 12% and volatile organic compounds by 30%.<sup>68</sup>

The trend to live in outlying communities and drive to work is expected to increase long-distance travel from 91 billion kilometres a year in 1995 to 140 billion by 2020.<sup>69</sup>

At the same time, the percentage of single occupant autos has increased from 82% in 1985 to 86% in 1995, while the average number of persons per car declined by 1.21 to 1.16 over the same period.<sup>70</sup>

## ALTERNATIVE FUELS/VEHICLES

### **Electric vehicles**

Even when the environmental impacts of electricity generation are taken into account, electric vehicles produce less greenhouse gases, and use less petroleum, energy and fossil fuels than conventional vehicles.<sup>71</sup> Electric cars are extremely quiet, which also helps to reduce noise pollution.

On the downside, electric vehicles require heavy batteries that require recharging often and limit range.<sup>72</sup> They are also limited by climate conditions. Current technology would make them unsuitable for driving in Ontario's winters.

### **Fuel Cells / Hybrid Vehicles**

Standard fuel cells generate electricity by combining hydrogen and oxygen into water. A new process that can extract hydrogen from gasoline has created a hybrid vehicle that can

utilize the existing fuel network to fuel vehicles that would achieve twice the current fuel economy while cutting pollution 90%.<sup>73</sup>

### **Propane**

Propane can reduce fuel costs by 20 to 45% and has very low hydrocarbon and carbon monoxide emissions. Vehicle conversions cost approximately \$2,000 to \$2,800.<sup>74</sup>

### **Natural Gas**

Natural gas is a clean burning fuel that is very low in hydrocarbon and carbon monoxide emissions, and high in octane. It's an ideal fuel for high-usage vehicles in urban areas. Natural gas costs about 40% less than gasoline. Conversion fees run between \$2,800 and \$3,800.<sup>75</sup>

## **CONCLUSION**

While it can be argued that Ontarians have unlimited transportation options government subsidies and inadequate legislation have weighted those options in favour of the individual use of the private automobile. Only when public transportation is as efficient as the private automobile will we see a wholesale change in driving habits. In order to accomplish this, aggressive legislation is required that gives adequate provincial support for public transportation that is at least comparable to that already provided for public highways and road development.

Legislative incentives and deterrents such as bike lanes, mandated car pools, no idling by-laws and placing the tax burden of maintaining our highway infrastructure on the user, would encourage the use of more sustainable forms of transportation. This would significantly reduce the atmospheric burden created by the burning of fossil fuels while relieving road congestion. When roads are less congested, traffic moves more efficiently, both in terms of fuel economy and driver comfort levels.

## **GREEN ENERGY GOALS**

Government subsidies should support public, not private transportation. In order to establish a more sustainable transportation sector, we must:

- improve public transportation,
- reduce government subsidies for private transportation,
- reduce transportation load on urban communities,
- move toward a user pay system,
- significantly reduce the use of the private automobile,
- improve public education,
- encourage the development of fuel efficient vehicles and alternative technologies, and
- investigate green energy fuels for non-road vehicles, thus reducing air, noise and other pollution.

## **Recommendations:**

1. A staged shift should be made by the province from provincial taxes to a user-pay infrastructure tax on gasoline and road use to cover the true cost of transportation in the province. There should be a corresponding reduction in property taxes that would eliminate the road portion currently paid by homeowners. (These two actions would be revenue neutral, but would place burden of financial responsibility on the transportation user, while highlighting the real cost of driving in the province.)
2. The federal and provincial governments should institute changes in the tax system to encourage the use of public transit and discourage the use of the private automobile for commuting. They should classify employer-provided transit passes as a tax-free benefit (carrot) and classify employer-provided free parking as a taxable benefit (stick).
3. Fuel efficiency and vehicle maintenance should be required knowledge for provincial driver testing and education.
4. The province should establish a provincial toll-road system on major highways for heavy transports (user pay).
5. Provincial licence plate fees should be based on vehicle weight (user pay).
6. The province should institute a strict corporate average fuel efficiency standard that includes sport utility vehicles and vans.
7. The province should eliminate standard third party insurance for low-risk drivers and replace it with a gasoline liability tax. This would achieve the goal of placing the burden of responsibility on the heaviest users, while ensuring that all vehicles are covered (revenue neutral).
8. A parking lot tax should be instituted for large commercial lots and shopping malls. Taxes would be paid by the mall owners and passed on to store owners according to sales, creating a user pay system. Tax revenues would go toward subsidizing public transit. All building permits should be conditional on the availability of adequate public transportation.
9. Building codes should be adopted to ensure that a dedicated, secure parking area for bicycles is incorporated into all commercial developments.
10. Expansion of highways should only be considered when they are the least cost solution for providing high quality transportation. This would mean the benefit of road improvement would be weighed against the benefits of improving urban transit or expanding rail service.



11. Designated bicycle and bus lanes should be required in all urban centres.
12. The federal and provincial governments should set up a corporate tax incentive for companies working on alternative fuel vehicles.
13. Road re-engineering and surface studies should be carried out to maximize mileage and traffic flow studies to eliminate bottlenecks.
14. The use of virgin raw materials should be minimized by redesigning plans for roadbed construction and include recycled materials such as rubber and glass.
15. The province should promote alternative energy sources and mechanical means for equipment currently dependent on fossil fuels and/or electricity such as lawnmowers, clippers, weed-eaters, etc. It should encourage mechanical means wherever possible, e.g., reel or push mowers, hand clippers and other hand tools.
16. A graduated minimum should be required for alternative fuel vehicles.
17. The province should legislate and enforce a reduction in highway speed.
18. The province should provide incentives and/or tax rebates for car-pooling.
19. The province should require full-dress pollution controls on all internal combustion vehicles, including railway locomotives.

## **SUMMARY OF RECOMMENDATIONS**

### **Effects**

1. The Government of Ontario should implement greenhouse gas emissions caps for both electricity generated within the province and imported to Ontario that will reduce greenhouse gas emissions 10% below 1990 levels by 2005. (This exceeds the Kyoto target of 6%)
2. Sulphur dioxide emission caps should reduce sulphur dioxide emissions 75% from the existing 175 kilotonnes per year to 43.75 kilotonnes, as recommended by the Acidifying Emissions Task Group.<sup>76</sup>
3. Nitrogen oxide caps should be put in place to reduce emissions to below 38 kilotonnes per year.
4. The virtual elimination and effective zero discharge of any emissions such as mercury,

lead, cadmium, arsenic, hexavalent chromium, nickel, polyaromatic hydrocarbons and particulates that are identified as persistent toxic substances, as per the International Joint Commission's recommendations.<sup>77</sup> This includes any radionuclides that meet the definition of persistent toxic substances.<sup>78</sup>

5. The risk associated with fluoride emissions from the utility sector should be clarified, and an appropriate course of action taken.<sup>79</sup>

6. The province should remove loan guarantees for Ontario Hydro. Pickering A and Bruce A should not be re-started. Pickering B, Bruce B and Darlington should be phased out at the time when major rehabilitation is required, i.e., fuel channel replacement, steam generator replacement - at the 20 to 30 year time period.

7. The province should require Ontario Hydro to establish an actual fund, under independent control, to pay for future costs of reactor demolition and long-term waste management.

8. The province should adopt the tritium drinking water standard of 100 Bq/L recommended by the Advisory Committee on Environmental Standards (ACES). (The current standard of 7,000 Bq/L. was set by the province in December 1994, down from a previous standard of 40,000 Bq/L.<sup>80</sup>

### **Demand**

1. Ontario's municipal utilities and other energy service companies should aggressively act on the promotion of energy efficiency services by performing energy audits, installing energy efficient devices and providing information to customers on how this will reduce their electricity/energy costs.

2. The province should provide full funding for all Green Communities Programs to perform energy audits and for teams to help homeowners and businesses install energy efficient equipment (perhaps a co-operative arrangement with public utilities - See Recommendation #1).

3. Aggressive energy efficiency standards should be out into the provincial building code.

4. A Builder Tax Credit should be provided to builders who install photovoltaic panels instead of standard roofing on new homes. (Benefits: cheaper energy costs for homeowners, increased volume in photovoltaic sales will bring down unit costs, higher re-sale value for homes.)

5. Provide tax incentives for any commercial or residential retrofits that would allow a full-cost write-off after three years.

6. Utilities should replace block rates with equal billing per kWh of electricity consumed. Small concessions could be made to businesses/industries who have a portion of their electricity supplied as interruptible power.
7. The province should develop curriculum materials for schools that integrate the concepts of pollution prevention, energy conservation and efficiency.
8. Through its community college system, the province should establish an energy efficiency job re-training programme for workers displaced by obsolete technologies.
9. Utilities should establish a high-use penalty rate for residential consumers, based on size of homes.

### **Production**

1. Ontario Hydro should immediately be forced to cancel any existing self-generation agreements (co-generation avoidance rates), such as those with Domtar and Shell Canada. and, companies should be encouraged to install self-generating facilities through tax incentives, such as full-cost write-offs over a period of three years.
2. Electricity generators must be required by the province to provide full disclosure regarding the source, emissions and full cost of their electricity.
3. The aggressive promotion of fuel switching for end-use application, such as from electricity to solar for water heaters and from electricity to natural gas for home heating.
4. The elimination of tax incentives and other subsidies to the fossil fuel industry should be eliminated. Realized revenues should be redirected to encourage the development of innovative energy producing technologies.
5. Additional tax incentives should be introduced to promote the development of environmental technologies, innovations such as district heating energy systems, co-generation and renewable energy sources, including tax rebates/incentives for switching to renewable sources
6. The various provincial government departments should coordinate their efforts to encourage district-heating systems.
7. Provincial regulations should require that landfill gas facilities become a mandatory part of all new landfill design.
8. The Ontario government should adopt the Canadian Wind Energy Association's targets of:

- a) the installation of at least 500 MW of wind generated electricity capacity by the year 2000 and at least 5,000 MW by the year 2010,
- b) the installation or export of 15,000 wind powered water-pumping systems by the year 2000, and
- c) the installation of 2,500 micro-wind systems by the year 2000.

### **Government Policy**

1. Ontario Hydro's provincial debt guarantee should be removed immediately in order to prohibit Ontario Hydro from making further bad investments, thereby ensuring that customers and taxpayers will not have to pay for additional stranded costs.
2. The province should establish a Renewable Portfolio Standard (RPS) that applies to all market participants both within the electricity pool and through bilateral contracts. The standard should require 5% of electricity sales from new renewables starting in 2000, rising by an additional 1% per year through 2011. Electricity generators should be required to provide full disclosure regarding the source, emissions and cost of their electricity.
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**DEMOCRACY AND ENVIRONMENTAL  
ACCOUNTABILITY IN ONTARIO**

By

Mark S. Winfield  
Canadian Institute for Environmental Law and Policy

And

Paul Muldoon  
Canadian Environmental Law Association

Prepared for

The Environmental Agenda for Ontario Project

April 1999

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## SUMMARY

The past four years have witnessed an unprecedented dismantling of the mechanisms for ensuring the legal and political accountability of the provincial government for the decisions that it makes about Ontario's environment and natural resources. The exercise of power over these public goods and public resources has been increasingly separated from accountability to the public for the consequences of those decisions.

### *The Accountability of the Provincial Government to Ontarians*

The extensive use of enabling legislation has marginalized the role of the Legislature by eliminating the need for the cabinet and bureaucracy to seek the approval of the public's elected representatives before taking action. At the same time, decision-making authority over public resources has been transferred to private entities not accountable to the public; freedom of information legislation weakened or undermined; the independence of adjudicative boards, commissions and tribunals eroded; independent advisory committees eliminated; commitments to aboriginal peoples abandoned; and environmental monitoring and reporting programmes drastically reduced. As a result, the exercise of power by the provincial government and its agents has been increasingly separated from accountability to the public for the consequences of these actions.

These measures not only threaten the protection of the province's environment, and the sustainable management of its natural resources, they also present a challenge to the basic principles of parliamentary democracy, responsible government and the rule of law. Similar changes have occurred to mechanisms for public participation in public policy decision-making, especially in the areas of environmental approvals and environmental assessment. Major legislative and institutional reforms are necessary to deal with this situation.

### *Public Participation in Decision-Making*

Over the same period, opportunities for members of the public to participate in decisions about the environment and public resources have also been severely affected. Requirements for public hearings before the approval of major projects, such as landfills, for example, have been removed, while the expiry of the intervenor funding program has made it very difficult for citizens and communities to participate effectively when hearings are held. The weakening of *Environmental Assessment Act* has significant implications in terms of the degree to which the potential long-term costs and benefits of major projects and activities will be understood before they are approved.

### **Key Recommendations**

1. An independent Commission should be established to conduct a review of the procedures, functions and structure of the Legislature, reporting within one year of its establishment. The Commission's mandate should recognize deliberation as the central function of the Legislature, and that other interests, including governmental convenience, are secondary. In the interim, a procedure should be established to permit the Legislature

to disallow proposals by the government to introduce, amend or repeal regulations. The use of omnibus legislation to make unrelated substantive amendments to more than one statute should be barred.

2. Legislation should be adopted to remove: crown immunity clauses; clauses stating that regulations can override the provisions of statutes; clauses exempting the making of regulations by the cabinet and other bodies from the requirements of the *Regulations Act*; clauses permitting the setting of tax rates by the Minister of Finance or cabinet, rather than the Legislature; provisions permitting the alteration of statutes without the approval of the Legislature; and clauses permitting the delegation of decision-making powers to persons who are not public entities or officials, from legislation enacted over the preceding five years.
3. Legislation should be adopted to apply the requirements of the *Environmental Bill of Rights*, *Ombudsman Act*, *Freedom of Information and Protection of Privacy Act*, *Audit Act*, *Environmental Assessment Act* and *French Language Services Act* to all private or non-governmental organizations to whom provincial governmental functions or decision-making authority have been delegated, and to corporations in which the Crown in Right of Ontario is the primary or sole shareholder.
4. The *Environmental Bill of Rights* model of a public registry, and notice and public comment period requirements should be extended to all proposals to introduce, amend or repeal regulations and major public policies through amendments to the *Regulations Act*.
5. The Regulatory Impact and Competitiveness Test, developed by the Red Tape Commission should be terminated, and a new evaluative policy for proposed regulations, programs and policies adopted by the government of Ontario. This new policy should emphasize the achievement of net gains to the social, environmental and economic sustainability of Ontario society.
6. Legislation should be adopted to require that all government advertising be reviewed by the Legislative Assembly's Integrity Commissioner to ensure that it is informational rather than partisan in nature.
7. The *Freedom of Information and Protection of Privacy Act*, and the *Municipal Freedom of Information and Protection of Privacy Act* should be amended to widen the application of the Acts, to reduce the scope of exemptions from their requirements, and to provide that the Information and Privacy Commissioner, rather than the heads of agencies, make determinations of when information requests can be rejected on the basis of their "frivolousness" or "vexatiousness."
8. Legislation should be adopted regarding appointments to regulatory agencies, boards and commissions. This should provide for the review of proposed appointments by a committee of the Legislature; require that terms for appointments be fixed, not at pleasure; create strict conflict of interest rules regarding appointments; and mandate the establishment of independent advisory committees regarding appointments to regulatory tribunals.



9. The *Municipal Act* should be amended to strengthen the authority of local governments to deal with environmental matters.
10. The Government of Ontario should re-affirm its commitment to the 1991 Statement of Political Relationship with the province's First Nations and aboriginal peoples.
11. The *Business Corporations Act* should be amended to require that provincially incorporated firms provide information on their environmental performance in their Annual Reports to shareholders.
12. The *Occupational Health and Safety Act* should be amended to provide a right to refuse environmentally damaging work, similar to the existing right to refuse dangerous work.
13. The provincial government should commit to providing the public with a comprehensive state of the environment report for Ontario every two years. The province's major environmental and natural resources management statutes should be amended to require tabling of annual reports to the Legislature on the administration and enforcement of these Acts.
14. The *Environmental Assessment Act* (EAA) should be amended: (a) the Act should apply to all environmental assessments; (b) an exemption from the requirements of the EAA should only be granted pursuant to clearly articulated statutory criteria and after there has been public comment on the proposed exemption; (c) exemption requests should be scrutinized by an independent body for a recommendation to the Minister; and (e) all environmental assessments should be conducted pursuant to legislated criteria, which must include the purpose of, need for, and alternatives to the proposal.
15. The approval of a class EA must be carried out in accordance with that of a full individual EA. Class EA's must be limited by statute to minor activities that have insignificant, predictable, and mitigable impacts on the environment. Furthermore, there needs to be a statutory requirement to include a bump-up provision in all class EA's.
16. The EAA should be amended to add the following features: (a) a requirement for early and meaningful public consultation throughout the EA process, including timely notice provisions, free access to relevant information, and the provision of participant and intervenor funding where appropriate; (b) a requirement for follow-up and effectiveness monitoring; (c) a mechanism to evaluate government policies and programmes; (d) inclusion of consideration of cumulative and synergistic effects; and (e) the establishment of an independent advisory council to assist the Minister.
17. The government must ensure that there are adequate trained staff and resources to carry out environmental enforcement activities effectively. The investigations branch should resume publishing enforcement statistics on an annual basis.

18. Intervenor funding should be renewed to enable individuals and groups involved in environmental decision-making procedures to participate effectively.
19. The basic prohibition on pollution discharges without a permit should be maintained. Permits should only be issued if it can be demonstrated that there will be no adverse effect on the natural environment. Standardized approvals may be appropriate for activities that are simple and routine and have only very minor impacts on the natural environment and human health as long as an adequate auditing scheme is also put in place. The development of standardized approvals must be undertaken with full public participation.
21. Different government staff or a different department than the staff that made the original decision should carry out requests for review and investigation under the *Environmental Bill of Rights*. The Environmental Commissioner of Ontario should be able to undertake requests for review, requests for investigation, and to comment on proposals affecting legislation and regulations under its mandate.
22. With respect to the *Environmental Bill of Rights*:
  - (a) The electronic registry should be improved by providing a wide range of searching options and ensuring that accurate precise summaries are included for each posting.
  - (b) The leave to appeal provisions should be clarified to better inform the public as to what information is required to satisfy the test. There should also be some provision for extending the 15-day deadline for filing the leave to appeal.
  - (c) The right to sue provisions of the EBR should be reviewed in order to determine whether the preconditions are too onerous. If so, they should be amended accordingly.
23. There should be ramifications for ministries that do not promulgate an instrument classification regulation under the EBR within 1 year.

Authors:

Mark Winfield is the director of research with the Canadian Institute for Environmental Law and Policy. He holds a doctorate in political science from the University of Toronto, and has published numerous articles and reports on environmental law and policy.

Paul Muldoon is the executive director of the Canadian Environmental Law Association, a public interest group whose mandate is to use and improve laws to protect the environment. He also teaches environmental law and policy at the University of Toronto and York University.

Acknowledgements:

The authors would like to thank Paul McCulloch who, while a student-at-law at the Canadian Environmental Law Association, provided research and insights into this chapter. The authors would also like to thank those who reviewed earlier drafts of this paper: Margaret Casey, Duff Conacher, Bob Gibson, Bruce Lofquist, and Bob Sexsmith.

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# DEMOCRACY AND ENVIRONMENTAL ACCOUNTABILITY IN ONTARIO

## PART 1 – GOVERNMENT POWER AND ACCOUNTABILITY IN ONTARIO

*...the struggle for responsible government is a continuing one.*

F.F.Schindler, Responsible Government in Ontario<sup>1</sup>

### Introduction

In its March 1997 document *Our Future! Our Health!: A Statement of Concern*, the Ontario Environmental Protection Working Group, a coalition of some of the province's leading environmental organizations, identified a set of fundamental principles that should form the foundation of the province's environmental and natural resource management policies. These principles are presented in Box 1.<sup>2</sup>

#### PRINCIPLES FOR ONTARIO'S ENVIRONMENTAL AND NATURAL RESOURCE POLICIES

- Ontario's parks, forests, wildlife, air, public lands, and waterways constitute a public trust, which must be protected and conserved for the future benefit of all Ontarians.
- Governments have a fundamental role to play in the protection of these public goods, the protection and enhancement of ecological capital, and in ensuring the environmentally sustainable use of energy, land, material and energy resources. Governments, acting in the public interest, must ensure that economic activities are carried out in the context of ecological sustainability, and are socially desirable and economically viable (on a full cost accounting basis).
- Governments have a responsibility to provide and enforce environmental standards. On the basis of historical experience and current events, private actors cannot be relied upon to regulate their own use of public environmental resources. The marketplace alone cannot provide for the effective protection of public goods, such as public health and safety, clean air, water and land, the protection and conservation of biological diversity and the ecologically sustainable management of natural resources.
- Governments must be able to be held to account for their actions and the consequences of their laws and policies. State of the Environment Reporting and public access to information are the cornerstones of this accountability.
- Governments must ensure that those who will be affected by government decisions and policies have the right to participate in the decision and policy-making process.
- Governments must ensure that sufficient resources are provided to the agencies, boards and commissions mandated to protect Ontario's environment and natural resources.

Source: Ontario Environmental Protection Working Group, *Our Future, Our Health: A Statement of Concern* by Ontario Environmental Organizations, March 1997.

The events of the past few years have seriously challenged these principles. The province has witnessed the adoption of a series of measures, the effect of which has been to separate the exercise of power over the province's environment, natural resources and other public goods from accountability to the public for the consequences of those decisions.

There has also been dramatic erosion of the role of the Legislature, and its ability to oversee and limit the exercise of power by the cabinet and bureaucracy. In addition, a substantial portion of the provincial government's decision-making authority over the province's environment and natural resources has been transferred to private and semi-private entities.

These developments have been accompanied by significant losses of opportunities for public participation in decision-making. This has occurred through the direct removal of public participation mechanisms through legislative amendments, the elimination of mechanisms to facilitate and support public participation in public hearings and other formal decision-making processes, and the movement of decision-making responsibility over public resources to the private sector.

### **The Loss of Legal and Political Accountability for Decision-Making about Ontario's Environment and Natural Resources**

Ensuring the accountability of the provincial government for the consequences of its decisions about the environment and natural resources has always presented significant challenges. The adoption of the *Environmental Assessment Act* in 1975, *Freedom of Information and Protection of Privacy Act* (FOIPPA) in 1987, the *Municipal Freedom of Information and Protection of Privacy Act* (MFIPPA) in 1989 and the *Environmental Bill of Rights* and creation of the Office of the Environmental Commissioner in 1993 have each contributed to the public's ability to hold the government to account for its environmental decisions and policies.

Significant gaps, however, remained. The province, for example, has never presented a comprehensive state of the environment report, and certain types of potentially important provincial government information remained exempt from the FOIPPA.

These problems have grown significantly worse over the past few years. The ability of the Legislature, the courts and, most importantly, the public to hold the government of Ontario to account for the consequences of the decisions that it makes about the province's environment and natural resources has been seriously eroded. This is the result of a range of measures undertaken by the provincial government, including the following:

### **The Extensive Use of Enabling Legislation**

*Parliamentarians, as elected representatives of the people, must not forfeit their responsibility to control ultimately what becomes law.*



Prof. Paul Thomas, University of Manitoba, to the Standing  
Committee on Regulations and Private Bills, Legislative Assembly  
of Ontario, April 1988.<sup>3</sup>

Concerns about the provincial government's growing use of enabling legislation, which permits the government to make regulations in relation to a given subject but provides no specific policy guidance or parameters with respect to the content of these regulations, have been expressed on numerous occasions over the past twenty years.<sup>4</sup> The combination of the provision of broad delegated authority, and weak legislative supervision of the use of this authority was seen to have rendered the government's formal accountability to the Legislature for regulation making a "dead letter."<sup>5</sup>

This problem has expanded enormously in Ontario over the past four years. In fact, virtually every provincial statute related to the environment and natural resources management has been amended to give the cabinet the authority to apply, amend, and repeal its requirements through regulations,<sup>6</sup> often through the use of omnibus legislation substantively amending dozens of statutes at once.<sup>7</sup> Many of the amendments also permit the delegation of responsibility for the administration and enforcement of key elements of these statutes to municipalities,<sup>8</sup> and even non-governmental actors.<sup>9</sup>

These provisions permit the Cabinet, and in some cases, individual Ministers to make major changes in public policy, and transfer the management and decision-making authority over public resources from public entities to the private sector without debate or agreement from the Legislature. In some cases, the clauses are so broad that they seem to permit the government to do almost anything it wants within the scope of the legislation without having to return to the Legislature for approval or additional authority.<sup>10</sup>

Similarly, the government has adopted legislation that permits certain taxation levels to be established by the cabinet or Minister of Finance, rather than by a vote of Legislature.<sup>11</sup> This violates a long-standing convention that tax rates be set by the Legislature through its approval of legislation to implement the province's annual budget.<sup>12</sup> The government has also enacted legislation that would permit the amendment of statutes without the approval of the Legislature.<sup>13</sup>

These measures constitute a serious attack on the principles of the rule of law, and of parliamentary democracy. At the core of these principles is the notion that the executive (i.e., the cabinet and bureaucracy) are only permitted to act within the boundaries of the authority provided to them by the elected members of the Legislature. These principles are undermined when the Legislature effectively grants the executive the power to determine the limits of its own authority. Yet this is what has happened in Ontario in recent years.

### **The Transfer of Public Policy Decisions-Making to Private Entities**

One of the most important trends of the past few years has been the transfer of regulatory functions and decision-making authority related to the protection of the environment, public health and safety, and the management of public resources, to private and non-governmental agencies. The most dramatic example of such a transfer was the May 1997 movement of the public safety regulation responsibilities of the Ministry of Consumer and Commercial Relations, dealing with everything from upholstered furniture to elevators to underground storage tanks for gasoline, to a private, non-governmental entity called the Technical Standards and Safety Authority (TSSA). Representatives of the industries it is mandated to regulate dominate the Authority's Board of Directors.<sup>14</sup>

Other Ministries have followed similar paths. In the case of the Ministry of Natural Resources, a range of Ministry functions related to inspection, record keeping and enforcement have been effectively transferred to the forestry,<sup>15</sup> aggregates,<sup>16</sup> petroleum,<sup>17</sup> and commercial fisheries industries.<sup>18</sup> The Ministry of Northern Development and Mines has moved in the same direction with the administration of the mine closure provisions of the *Mining Act*.

One of the key consequences of these transfers is that the entities to whom these functions are assigned and their activities and the decisions that they make escape oversight by, and accountability to, the Legislature and its agents, such as the Environmental Commissioner, Ombudsman, Provincial Auditor, and Freedom of Information and Protection of Privacy Commissioner. The operations, activities and decisions of these entities are also freed of the requirements of the *Environmental Bill of Rights*, *Freedom of Information and Protection of Privacy Act*, *Ombudsman Act*, *Audit Act*, *Environmental Assessment Act*, *French Language Services Act* and other legislation that applies to agencies of the provincial government.

The transformation of the successor generation and services corporations to Ontario Hydro into private entities incorporated under the *Business Corporations Act* and held by the Crown in Right of Ontario through Bill 35, the *Electricity Competition Act* has had a similar effect. The Independent Market Operator and Electrical Safety Authority created through the Act escape the requirements of legislation that normally applies to public entities through the same means.

In addition to explicit transfers of management and decision-making responsibilities, there has been a widespread *de facto* delegation of decision-making over public resources to the private sector through the removal of approval requirements for a broad range of activities with respect to these resources. This has been particularly evident with respect to public lands and public waterways in Northern Ontario.<sup>19</sup> Again, these decisions made by private actors are subject to no meaningful accountability, review or public reporting mechanisms.

In other cases, advisory bodies whose membership consists overwhelmingly of representatives of particular economic or social interests have been given effective control over significant public resources. One of the clearest examples of this has been the role granted to the Game and Fish Advisory Board of the Ministry of Natural Resources. This body, whose membership is dominated by sport hunting and fishing interests, has been granted substantial influence over the Ministry's fish and wildlife management programs and budget.<sup>20</sup>

## The Weakening of Freedom of Information Legislation

The passage of the *Freedom of Information and Protection of Privacy Act* (FOIPPA) in 1987 marked a major step forward in strengthening the ability of Ontarians to hold their provincial government and its agencies to account for their actions and decisions. This Act has served as the model for legislation adopted by a number of other provinces.

A review of the FOIPPA completed by the Standing Committee on the Legislative Assembly in 1991, identified no major flaws or weaknesses in the Statute. The Committee did, however, recommend a number of changes to the Act, including the widening of the Act's application, and the strengthening of the limits on the exemptions to the Act.<sup>21</sup> These exemptions constrain public access to such things as cabinet records, policy advice to the government provided by public servants or consultants, documents affecting intergovernmental relations, and information affecting the "economic and other interests of Ontario."<sup>22</sup>

The Standing Committee conducted a review of the *Municipal Freedom of Information and Protection of Privacy Act* (MFIPPA) in 1994. The MFIPPA, which was passed in 1989 and came into force in 1991, extended freedom of information and protection of privacy principles to more than 2500 local government institutions, including municipal corporations, school boards, public utilities commissions, hydro-electric commissions, transit commissions, police commissions, conservation authorities, boards of health and other local boards. The Committee's conclusions regarding the MFIPPA were similar to its findings with respect to the FOIPPA.<sup>23</sup>

No action was taken to implement the Standing Committee's 1991 recommendations regarding the FOIPPA and 1994 recommendations with respect to the MFIPPA prior to the June 1995 election.

The situation with respect to the FOIPPA and MFIPPA changed dramatically in January 1996, with the passage of Bill 26, the *Savings and Restructuring Act, 1996*. Schedule K of the Bill amended the Acts to permit the establishment of fees for appeals of access to information decisions, permit charges for the first two hours of search time in relation to access requests, allow heads of agencies to deny access to records on the basis that requests are "frivolous or vexatious" and permit the Lieutenant-Governor in Council to establish regulations for determining what constitutes a "frivolous or vexatious" request. Schedule O of the Act amended the FOIPPA to state that the provisions of the *Mining Act* regarding the confidentiality of financial information provided by mining companies with respect to financial security requirements related to mine closure prevailed over the FOIPPA.

These amendments to the Acts were strongly opposed by the Freedom of Information and Privacy Commissioner,<sup>24</sup> and by many members of the public and non-governmental organizations.<sup>25</sup> Although the new provisions of the Acts related to the establishment of standards for frivolous and vexatious requests have not been employed, a \$25 fee for appeals of denied access requests has been implemented, and charges are being levied by agencies for the first two hours of search time in relation to requests. As most freedom of information requests require less than two hours of search time to fulfil, this means that charges are now being levied

for access to information that was previously free of charge. This is emerging as a significant barrier to public access to information.

### **The Red Tape Commission and the Cost-Benefit Tests for Actions to Protect Public Goods**

In July 1996, the Ontario government adopted a “Less Paper/More Jobs” test for proposed new regulations.<sup>26</sup> A more formal “Regulatory Impact and Competitiveness” test for new regulations was adopted the following year. These policies established a strict cost-benefit test for all proposed new regulations.<sup>27</sup> Ontario is the only Canadian province to have adopted a formal cost-benefit requirement of this nature.<sup>28</sup> The use of such tests has been widely criticized as creating an unnecessary barrier to the adoption of measures needed to protect the environment and human health and safety.

In its 1988 report on the regulatory process in Ontario, the Legislature's Standing Committee on Regulations and Private Bills, for example, highlighted the administrative costs associated with such tests relative to their potential benefits.<sup>29</sup> In its May 1998 report on environmental law enforcement, the House of Commons Standing Committee on Environment and Sustainable Development stressed the failure of such tests to consider fully the environmental, health and social benefits associated with new environmental protection measures.<sup>30</sup>

The adoption of a formal costs-benefit test by the province is of particular concern when considered in combination with the Bill 76 amendments to the *Environmental Assessment Act* enacted in December 1996. As outlined in the second part of this paper, these substantially narrowed the potential scope of the environmental assessment process. In effect, the consideration of the implications of provincial undertakings for the long-term environmental, social and economic sustainability of Ontario society has been reduced at the same time that new barriers have been adopted to the establishment of measures to protect these public goods for the actions of private actors.

The “More Jobs/Less Paper” and “Regulatory Impact and Competitiveness” tests were developed by the government's Red Tape Commission. The Commission is a committee of government MPP's established in the fall of 1995. It tabled extensive recommendations for the weakening of environmental regulations and

#### **THE REGULATORY IMPACT AND COMPETITIVENESS TEST**

- Regulatory action will be restricted to instances requiring intervention.
- The need and method of regulatory action will be assessed through comprehensive consultations undertaken early in the decision-making process, with all realistic alternatives being thoroughly explored.
- Implementation of the Regulatory Action will either enhance or be neutral to Ontario's competitiveness.
- The benefits of the proposed regulatory action must outweigh the risks of consequences of available alternatives or non-intervention.
- The regulatory action will be administered as efficiently as possible, minimizing procedures and the paper burden.
- All government legislation, regulations, policies and processes will be the subject of on-going review.

Source: Red Tape Commission, *Cutting the Red Tape Barriers to Jobs and Better Government*, January 1997.

standards in January 1997.<sup>31</sup> The Commission has intervened on behalf of industrial interests to block the adoption of stronger environmental standards, even in the face of overwhelming evidence of the need for change.<sup>32</sup> In effect, the Commission, which has been mandated to act as the secretariat to the Cabinet Committee on Regulations,<sup>33</sup> has provided economic interests with a means of by-passing the normal Ministry policy development processes with respect to initiatives that they may oppose. The Commission has also attempted to intervene in prosecutions by the Ministry of the Environment on behalf of industrial defendants.<sup>34</sup>

### **The Weakening of the Independence of Agencies, Boards and Commissions**

The independence and impartiality of many provincial agencies, boards and commissions charged with the protection of major environmental resources has been seriously eroded over the past few years. In the case of the Niagara Escarpment Commission, for example, appointments over the past two years have included individuals known to be hostile to the goal of the protection of the ecological integrity of the escarpment,<sup>35</sup> or who have had economic interests in its exploitation.<sup>36</sup>

Similar concerns have been raised regarding the impact of recent appointments on other regulatory and adjudicative bodies, including ones outside of the environmental field.<sup>37</sup> In light of these appointments, over the past year, both the Chief Justice of Ontario,<sup>38</sup> and the Ombudsman<sup>39</sup> have felt the need to make public statements regarding the need to ensure the independence and impartiality of the province's adjudicative agencies.

### **The Elimination of Independent Advisory Committees**

Over the past thirty years, a number of independent advisory committees were established to provide the government with advice in specific areas of public policy, including the environment. The advice and recommendations of these bodies to the government was also available to the public. They were often important sources of policy ideas and, on occasion, well-informed criticism of the policies of the government of the day.

Many of these independent bodies, including the Ontario Law Reform Commission,<sup>40</sup> Ontario Round Table on Environment and Economy,<sup>41</sup> the Environmental Assessment Advisory Committee, Advisory Committee on Environmental Standards, and the Municipal Industrial Strategy for Abatement (MISA) Advisory Committee<sup>42</sup> have been eliminated since 1995. This represents the loss of a significant public accountability mechanism for the government in the specialized areas of public policy addressed by such entities.

## **The Enactment of Crown Immunity Clauses**

Crown immunity clauses have been incorporated into a number of key environmental statutes over the past four years.<sup>43</sup> Until 1995 the incorporation of such clauses into provincial legislation had been rare. Crown immunity clauses state that the provincial government cannot be sued by someone who is harmed as a result of a decision that it makes under specific provisions of those statutes. In effect, such clauses enable the government to escape legal responsibility for the negative consequences of its actions.

## **Election Finance**

Controls on political party fund raising and campaign expenses were first adopted in Ontario through the 1975 *Election Finance Reform Act*. The Act established limits on both contributions and campaign expenditures. It was generally regarded as being successful and effective, particularly in limiting the ability of small numbers of very wealthy interests to influence the activities of candidates and parties, and thus of MPPs and government, through confidential donations of large sums of money to these political actors.<sup>44</sup>

The most significant weakness in the existing system was seen to be its failure to establish expenditure limits on non-party activities, such as advertising by interest groups during an election campaign. Such activities were seen as having the potential to undermine the expenditure limits on party campaign activities established by the Act.<sup>45</sup>

Amendments to the *Election Finances Act* were introduced by the government and enacted in June 1998.<sup>46</sup> These raised the expenditure limits on party election campaigns, and removed the limits on certain types of election spending, including polling, research and travel. The amendments were subject to widespread criticism that they would give the party with the largest financial resources an unfair advantage in the election campaign.<sup>47</sup>

Concerns have also been raised regarding the use of public funds by past and present governments for what has been seen by many to be political advertising outside of the electoral and party financing framework. To address this problem, proposals have been advanced to require that all government advertising be reviewed by the Legislative Assembly's Integrity Commissioner to ensure that it is informational, rather than partisan in nature.<sup>48</sup>

## **Balanced Budget Legislation**

In December 1998, legislation was introduced to require that the Minister of Finance present a balanced budget to the Legislative Assembly each year. The proposed legislation would also bar increases in corporate or personal income taxes, the provincial sales tax, gasoline and fuel taxes, education taxes and the employer health tax unless the increases were approved through a referendum, or presented as part of a successful election platform.<sup>49</sup>

The legislation includes exemptions for emergencies and permits increases in the designated taxes for the purposes of “restructuring” of Crown agencies and certain other circumstances.<sup>50</sup> The proposed legislation died on the Order Paper in December 1998. However, it is expected to be reintroduced when the Legislature resumes in the spring of 1999. The proposed legislation appears intended to bind future governments to the fiscal policies of the current government, regardless of the outcomes of future elections. Its structure will also make it difficult to deal with changes in the province’s economic and social circumstances, or to restructure the province’s tax system to deal with new priorities.

### **Constraining Local Democracy: Municipal Governments and Conservation Authorities**

One of the central features of the past few years has been the degree to which the provincial government has transferred responsibility for the delivery of programmes and their consequences to municipal governments, while retaining or even strengthening its own power to direct the actions of local agencies.

These transfers have included operational and financial responsibility for the delivery of sewer and water services,<sup>51</sup> public transit,<sup>52</sup> residential recycling programmes,<sup>53</sup> drinking water testing,<sup>54</sup> the regulation of septic systems,<sup>55</sup> the management of conservation lands,<sup>56</sup> and environmental protection in relation to land-use planning.<sup>57</sup> Typically, little or no resources have been provided by the province to assist municipalities in the delivery of these services. Indeed, the provincial support that had been provided in these areas has been withdrawn. At the same time, the province has proposed amendments to the *Municipal Act* to increase its ability to direct the activities of municipal governments.<sup>58</sup>

The provincial government has not hesitated to override important or innovative local environmental decisions in favour of particular economic or institutional interests. This has included disallowing an anti-idling by-law enacted by the former City of Toronto,<sup>59</sup> adopting a regulation to prevent municipalities from charging product manufacturers or importers for the costs of dealing with their products or packaging through municipal recycling programs,<sup>60</sup> blocking municipal efforts to protect ecologically sensitive areas from aggregates development,<sup>61</sup> and establishing barriers to the adoption of municipal by-laws to control the environmental and health impacts of agricultural operations.<sup>62</sup>

Finally, the province has forced the amalgamation of a number of municipalities against the clearly expressed wishes of their municipal councils and residents. The most prominent example of such action was the amalgamation of the six municipalities making up Metropolitan Toronto into a single City of Toronto.<sup>63</sup> In this case, opposition to the province's proposals was stated by all of the affected local councils, and by seventy-six per cent of Toronto residents who voted in a municipally sponsored referendum on the subject.<sup>64</sup>

### **Aboriginal Peoples**

In 1991, the government of Ontario issued a Statement of Political Relationship with the province's aboriginal peoples. The Statement indicated the province's intention to deal with First Nations and aboriginal peoples on a government-to-government basis.

However, the past four years have witnessed a dramatic deterioration of relations between the provincial government and the aboriginal peoples of Ontario. The actions of the provincial government to end the occupation of Ipperwash Provincial Park by aboriginal protestors<sup>65</sup>, the approach of the Ministry of Natural Resources to issues related to aboriginal fishing and hunting rights<sup>66</sup> and the "Lands for Life" land-use planing process in Northern Ontario<sup>67</sup> have each emerged as major points of conflict between the provincial government and aboriginal peoples.

### **The Elimination of Environmental Monitoring and Reporting Activities**

The accountability of the provincial government for the consequences of its decisions has been further eroded by dramatic reductions in the province's environmental science, monitoring and reporting activities. In many cases, environmental information is simply no longer being gathered and made available to the public.

This was highlighted by the Minister of the Environment's March 1997 statement that the development of a "State of the Environment" Report for the province was not worth the effort and expenditure.<sup>68</sup> From the perspectives of good public policy making and public accountability, the Environmental Commissioner,<sup>69</sup> Provincial Auditor,<sup>70</sup> the International Joint Commission<sup>71</sup> and the North American Commission on Environmental Co-operation<sup>72</sup> have all expressed serious concerns about this trend.

The province has also terminated reporting on its own environmental activities. Among the most significant of these measures was the decision in 1995 to discontinue the publication of annual reports on the Ministry of the Environment's environmental law enforcement activities.

### **Public Participation in Decision-Making**

The establishment of effective mechanisms for public participation in environmental and natural resources management decision-making has always been an important goal. In addition to ensuring that those who will be affected by environmental and natural resources management decisions have an opportunity to participate in those decisions, public participation processes are critically important accountability mechanisms. Effectively, these processes require the government to justify its decisions in open forums before the public or independent tribunals.

Substantial progress had been made in this area over the past thirty years through the enactment of statutes like the *Environmental Protection Act* in 1971, the *Environmental Assessment Act* in 1975, the *Intervenor Funding Project Act* in 1988 and the *Environmental Bill of Rights* in 1993. However, significant gaps remained in the public's ability to participate effectively in environmental decision-making in the province.



These problems have become significantly worse over the past few years. This has occurred in a number of ways. In some cases, statutory amendments have weakened or removed public participation requirements.<sup>73</sup> In others, Ministers have been granted expanded discretion on granting public hearings under such statutes as the *Environmental Protection* and *Environmental Assessment* Acts.<sup>74</sup> The removal of approval requirements, such as has taken place under the *Public Lands Act* and the *Lakes and Rivers Improvements Act*,<sup>75</sup> also removes the need for the posting of proposed approvals on the *Environmental Bill of Rights* electronic registry. The transfer of decision-making authority to non-governmental entities, such as the TSSA, has the potential to produce the same result. The expiry of the *Intervenor Funding Project Act* has emerged as a major barrier to effective public participation in public hearings.

### **The Overall Result**

Ensuring the accountability of the provincial government for decisions that affect the environment has always presented significant challenges. Although substantial progress to improve the situation has occurred over the past thirty years, significant gaps remained. A similar series of developments had taken place with respect to public participation in decision-making.

These trends have been significantly reversed over the past four years. Public policy decisions about the management and fate of public resources, and with major implications for public health and safety, are now being made without adequate structures for public accountability for the consequences of those decisions. In effect, power is being exercised by the provincial government and private entities to which it has delegated its decision-making authority without corresponding mechanisms for responsibility and oversight. In many cases, the transfer of decision-making responsibilities and other functions seem designed to remove these activities from oversight by the Legislature, its agents, and the public at large.

The end result of these changes is growing evidence that the province's public resources are being managed for the benefit of private rather than public interests. At the same time, there has been a parallel erosion of opportunities for public participation in decision-making.

### **A Democracy Package for Ontario**

Over the past few years, Canadian governments have claimed with increasing vehemence that they have no choice about the public policies that they pursue, pointing to the need for deficit reduction and the consequences of globalization and international trade liberalization. In reality, governments, including the government of Ontario, can and do continue to make micro and macro level choices all the time. They should not be allowed to escape responsibility for the consequences of these decisions. Nor should the private sector when it is granted decision-making authority over public resources by governments.

It is evident that accountability and responsibility for decision-making over public resources and other public goods have been seriously eroded in Ontario over the past few years. Major legislative and institutional reforms are necessary to deal with this situation.

## The Legislature

*(the House of Commons is) far more than a creature of the constitution; it is central to it and the single most important institution of our free and democratic system of government.*

*Federal Court of Canada, 1986*<sup>76</sup>

As the assembly of the public's elected representatives, the Legislature stands at the centre of the accountability structure with respect to the management of the province's public goods, such as its environment and natural resources, and the protection of the health and safety of its residents. However, its role has been significantly weakened by the use of enabling legislation, while changes to its procedural rules have severely limited opportunities for debate on legislation.<sup>77</sup>

Over the past decade, a number of measures have been taken to strengthen the capacity of the federal House of Commons to oversee the activities of the federal government, and re-assert the ultimate responsibility of the cabinet and bureaucracy to Parliament.

In 1986, for example, the House of Commons Standing Orders were amended to give the House the power to disallow the repeal, amendment or establishment of regulations by Ministers or the cabinet.<sup>78</sup> In 1988, the Ontario Legislature's Standing Committee on Regulations and Private Bills made a recommendation that a similar power be established in Ontario.<sup>79</sup> Over the past four years, the establishment of such a mechanism is especially important in light of the extent of the use of enabling legislation, giving the cabinet and individual ministers the power to effectively amend legislation through regulations.

### Recommendation:

1. The Rules of Procedure of the Legislature should be amended to permit the disallowance of the introduction, amendment or repeal of regulations, as per the 1988 recommendations of the Standing Committee on Regulations and Private Acts. The use of omnibus bills, making unrelated substantive amendments to more than one statute, should be barred.

At the federal level, the 1986 amendments to the House of Commons Standing Orders also provided the standing committees of the House with the power to initiate studies of matters within their jurisdiction, and to require that the government respond to their recommendations within a fixed time period.<sup>80</sup> Over the past decade the Standing Committees of the House of Commons have made extensive use of this power. The Standing Committee on the Environment and Sustainable Development has, over the past three years, for example, conducted studies on federal subsidies and tax incentives for environmentally destructive activities,<sup>81</sup> the regulation of biotechnology,<sup>82</sup> and the enforcement of federal environmental laws.<sup>83</sup> These studies have emerged as an important mechanism through which members of Parliament can investigate the activities of government agencies and the substantive details of specific public policies.

In Ontario, Standing Committees of the Legislature are limited to the review of proposed Legislation, and the review of departmental estimates.<sup>84</sup> Policy studies are only undertaken on rare occasions by specially established select committees of the Legislature within terms of reference agreed to by the government.<sup>85</sup> The establishment of a power of the Standing Committees of the Legislature to undertake independent studies could provide an important mechanism through which the Legislature could re-assert its authority over the government.

**Recommendation:**

2. Following the model of the House of Commons, the Rules of Procedure of the Legislature should be amended to permit the conduct of policy studies by standing committees of the Legislature, and to require the government to table responses to standing committee reports, when requested to do so by the committees.

Changes to the rules of procedure of the Legislature adopted over the past decade have severely limited opportunities for review and debate of legislation prior to its passage.<sup>86</sup> These changes have seriously undermined the key functions of the Legislature. Legislative debate is intended, among other things, to ensure that the public is informed of the content of the government's initiatives, and that members of the Legislature have the opportunity to consider the implications of the authority that the government is requesting before it is granted.

There has been no major review of the Legislature's rules and functions since the work of the Commission on the Legislature in the early 1970s. The Commission was established in 1972 and delivered five reports between 1973 and 1975.<sup>87</sup> Given the period of time that has passed since the original Commission's work, and the erosion of the effectiveness of the Legislature as a forum for accountability and debate over the past few years, consideration should be given to conducting a formal, independent review of the procedures, functions and structure of the Legislature as soon as possible.

**Recommendation:**

3. An independent commission should be established to conduct a review of the procedures, functions and structure of the Legislature.<sup>88</sup> The Commission should present its report and recommendations within one year of its establishment. Its mandate should recognize deliberation as the central function of the Legislature, and that other interests, including governmental convenience, are secondary.

**Legislation and the Rule of Law**

A central feature of the past four years has been the erosion of the principle of the rule of law in Ontario. The essence of this principle is that the executive (i.e. the Premier, Cabinet, individual ministers and the bureaucracy) can only act within the bounds of the authority granted to them by the elected members of the Legislature through the legislation that they enact.

## **Recommendation:**

Two statutes should be adopted to address this problem:

4. A “Rule of Law Restoration Act” should be enacted to remove from legislation enacted over the past four years all:
  - crown immunity clauses;
  - clauses stating that regulations can override the provisions of statutes;
  - clauses exempting the making of regulations, guidelines or policies by the Lieutenant Governor in Council, Ministers and Agencies, Boards and Commissions from the requirements of the *Regulations Act*;
  - clauses permitting the setting of tax rates by the Minister of Finance or Lieutenant Governor in Council, rather than the Legislature;
  - legislation permitting the alteration of statutes, for any reason, without the approval of the Legislature; and
  - clauses permitting the delegation of decision-making powers to persons who are not public entities or officials.
  
5. A “Government Accountability Restoration Act” should be adopted to apply the requirements of the *Environmental Bill of Rights*, *Ombudsman Act*, *Freedom of Information and Protection of Privacy Act*, *Audit Act*, *Environmental Assessment Act* and *French Language Services Act* to all delegated regulatory organizations such as the Technical Standards and Safety Authority, other private or non-governmental organizations to whom provincial governmental functions or decision-making authority have been delegated, and corporations in which the Crown in Right of Ontario is the primary or sole shareholder. Provision should be made to enable responsible Ministers to give policy direction to these entities in a manner similar to section 10 of the *Power Corporation Act*.

## **Regulations and the Regulatory Process**

The extent to which legislation has been amended over the past four years to provide enabling authority to the cabinet and, in some cases, even individual Ministers to make regulations dealing with virtually every matter within the scope of each statute requires significant changes to the regulatory process to ensure public accountability.

Currently, only proposed regulations or amendments to regulations dealing with matters affecting the environment are subject to requirements for public notice and a minimum public comment period of 30 days under the province's *Environmental Bill of Rights*. Amendments to the *Regulations Act* to require the provision of public notice and public comment periods on all proposals to introduce, amend or repeal regulations were recommended by the Legislature's Standing Committee on Regulations and Private Bills in 1988.<sup>89</sup> This has been required by statute in Quebec since 1986,<sup>90</sup> and by policy at the federal level since the late 1970's.<sup>91</sup>

## **Recommendation:**

6. The *Environmental Bill of Rights* model of a public registry, and notice and public comment period requirements should be extended to all proposals to introduce, amend or repeal regulations and major public policies through amendments to the *Regulations Act*.

### **Cost/Benefit Tests, Resource Accounting and Subsidies for Environmentally Unsustainable Development**

*I am not persuaded that the massive process of evaluation, the cost benefit analysis of regulation and the whole bureaucracy that has been set up in the federal sphere is what the province needs at all.*

Prof. Hudson Jarisch, University of Toronto, to the Standing Committee on Regulations and Private Bills, Legislative Assembly of Ontario, 1988.<sup>92</sup>

The “Regulatory Impact and Competitiveness” test for proposed new regulations adopted by the province in 1997 is inconsistent with the practices of other jurisdictions, and is a significant barrier to the adoption of new measures required to protect public safety, public health and the environment. It also fails to consider fully the environmental, health and social benefits associated with such measures. This more general problem with formal cost-benefit tests was highlighted by the House of Commons Standing Committee on the Environment and Sustainable Development in its May 1998 report on environmental law enforcement.<sup>93</sup>

At the same time, the government has failed to act on long-standing recommendations from the Environmental Assessment Advisory Committee<sup>94</sup> and other bodies<sup>95</sup> that environmental assessments of proposed government policies and programmes be conducted prior to their adoption. The federal cabinet adopted a policy requiring the environmental review of proposed programmes and policies in 1990.<sup>96</sup>

### **Recommendations:**

7. The Red Tape Commission's “Regulatory Impact and Competitiveness” test for new regulations should be withdrawn.
8. A new policy regarding the introduction, amendment or repeal of major regulations, policies and programmes should be adopted by the Government of Ontario. This should emphasize the achievement of net gains to the social, economic and ecological sustainability of Ontario society.<sup>97</sup>

The government of Ontario has also failed to keep up with recent trends towards the more complete accounting of the state of natural resource stocks, and environmental liabilities and deficits in measuring the state of the province's economic, social and environmental health. At the federal level, the Office of the Auditor General, and the newly established Office of the Commissioner for Environment and Sustainable Development have tabled a number of reports on these types of matters over the past few years.<sup>98</sup>

**Recommendation:**

9. The *Audit Act* should be amended to include reporting on status, condition and management of the province's natural resources, and on environmental liabilities and environmental deficits in the mandate of the Provincial Auditor.

In addition, the province has failed to examine the potential negative environmental and health impacts of its subsidies, tax expenditures and similar programmes. The potential impacts of such programmes were highlighted by the House of Commons Standing Committee on the Environment and Sustainable Development in its December 1995 report on the subject.<sup>99</sup> The Land Transfer Tax Rebate programme, for example, provides a strong incentive for the purchase of newly constructed homes. These are typically in new subdivisions. Consequently, the programme, as currently structured, promotes urban sprawl, with its accompanying environmental and infrastructure costs.<sup>100</sup>

**Recommendation:**

10. The provincial government should establish an independent task force to review provincial subsidies, grants, tax incentives and other provincial fiscal programmes to identify barriers and disincentives to sound environmental practices.

**Freedom of Information**

*The three main objectives of freedom of information legislation are to create openness in government, strengthen government accountability, and provide an opportunity for public participation.*

Ann Cavoukian, Ph.D., *Ontario Information and Privacy Commissioner, Annual Report 1997.*

The implementation of the Bill 26 amendments to the FOIPPA and MFIPPA has resulted in significant economic barriers to public access to information held by provincial and local government agencies. The recommendations of the Standing Committee on the Legislative Assembly's 1991 and 1994 reviews of the Acts also remains unaddressed.

**Recommendation:**

11. Amend the *Freedom of Information and Protection of Privacy Act* and the *Municipal Freedom of Information and Protection of Privacy Act* to:
  - remove the authority of the heads of agencies to deny access to records on basis that requests are "frivolous and vexatious." This should be replaced with a provision permitting the Freedom of Information Commissioner to authorize an agency or

institution to disregard a request for access on the basis that the request is frivolous or vexatious;<sup>101</sup>

- provide that the first two hours of search time in response to an information request be without cost;
- provide that a fee of not more than \$5 be levied when access decisions are appealed.

12. The FOIPPA should be amended to:

- limit the exemptions from the Act contained in sections 12 to 19 as recommended by the Standing Committee on the Legislative Assembly;<sup>102</sup> and
- place the onus on agencies denying access to a record on the basis of the exemptions provided in sections 13, 14, 15, 17, 18, 20 and 21 of the Act, that there is a "compelling public interest" in denying access.<sup>103</sup> The public interest override provision should be extended to section 12 (cabinet deliberations) of the Act.

The remaining recommendations made by the Standing Committee on the Legislative Assembly on the FOIPPA and MFIPPA should also be acted upon.

Finally, the exemption from the requirements of the FOIPPA provided through the Bill 26 amendments to the *Mining Act*, with respect to financial assurances and mine closure, should be removed from that Act.

**Recommendation:**

13. Section 145 of the *Mining Act*, as amended through Bill 26, should be deleted.

**Appointments to Agencies, Boards and Commissions**

A number of appointments to key agencies, boards and commissions charged with the protection of environmental resources, and the review of government environmental decisions have raised serious concerns over conflicts of interest and the qualifications of appointees.

**Recommendation:**

14. Legislation should be adopted regarding appointments to regulatory agencies, boards and commissions. This should provide that:

- proposed appointments, including those to quasi-judicial tribunals, be reviewed by a committee of the Legislature prior to their establishment;
- the terms for appointments should be fixed, not at pleasure, with removal only for cause;

- there be strict conflict of interest requirements forbidding the appointment to that body of individuals employed by, or who have represented, economic interests within the jurisdiction of a regulatory body within the past five years; and
- appointments of former ministers or officials of agencies within the jurisdiction of regulatory bodies be prohibited for five years after their departure from the agency; and
- independent advisory committees be established to provide nominations for appointments to regulatory tribunals, similar to the system that was been created for provincial court judges.<sup>104</sup>

### **Independent Advisory Bodies**

The elimination of independent advisory bodies over the past few years has significantly weakened the processes for the development of legislation, regulations, policies and programmes related to the environment, natural resources management and other fields. Their removal has also reduced the capacity of the legislature and the public at large to hold the government to account for its actions and policies, particularly in complex areas of public policy, like environmental protection and law reform.

### **Recommendation:**

15. The Minister of the Environment should establish the Environmental Council, provided for by Part VI of the *Environmental Protection Act*, to advise the Minister on the results of current research related to pollution and the natural environment, and other matters affecting the quality of the environment.
16. The Government of Ontario should establish an independent commission to inquire into and consider any matter relating to:
  - the reform of the law having regard to the statute law, the common law and judicial decisions;
  - the administration of justice;
  - judicial and quasi-judicial procedures under any Act; or
  - any subject referred to it by the Legislature or the Attorney-General.

### **Election Finance and Government Advertising**

Major concerns have been raised regarding recent changes to the *Election Finances Act* to reduce controls on election spending. The use of public funds by past and present governments for what has been seen by many to be partisan political advertising outside of the election and party financing framework has also emerged as a significant issue.



**Recommendation:**

- 17. Legislation should be adopted requiring that all government advertising be reviewed by the Legislative Assembly's Integrity Commissioner to ensure that it is informational, rather than partisan in nature. Party and election finance issues should be included in the mandate of the Commission on the Legislative Assembly proposed under Recommendation 3.

**Strengthening Local Democracy**

Despite their difficult relationship with the province over the past few years, local governments have demonstrated themselves to be a source of innovative programmes and initiatives to improve environmental quality in a wide range of areas. These have included water use and sewage treatment, waste management and recycling, energy efficiency, air quality and land-use. There are a number of measures that should be adopted by the province to strengthen the capacity of local governments to improve the health and environment of their residents.

**Recommendation:**

- 18. The *Municipal Act* should be amended to ensure openness in municipal government processes and the functional operation of municipal councils.<sup>105</sup>
- 19. The *Municipal Act* should be amended to expand the authority of municipal governments to act on environmental matters.<sup>106</sup> The Province should be prepared to provide support for such initiatives through the provision of information and technical assistance and support.
- 20. The *Municipal Act* should be amended to forbid amalgamation or dissolution of municipalities without the consent of the affected councils.

**A PROVINCIAL CONSTITUTION**

The concept of a formal, written provincial constitution has been proposed as a way of enshrining principles and institutions for democratic government in Ontario including such things as:

1. Requiring that taxation rates be set by the Legislature, not the Minister of Finance or cabinet;
2. Recognition that deliberation is the central function of the Legislature, and that other interests, including governmental convenience are secondary;
3. Recognition that Northern Ontario must have adequate representation in the province's governing structures; and
4. Protecting the autonomy of municipalities against dissolution or amalgamation against their will.

**Source:** R.Vipond, "To corral a runaway government," *The Globe and Mail*, December 10, 1997.

## Aboriginal Peoples

The relationship between aboriginal peoples and the government of Ontario has deteriorated significantly over the past few years, particularly as a result of the Ipperwash incident, and the "Lands for Life" process.

### Recommendation:

21. The Government of Ontario should re-affirm its commitment to its 1991 Statement of Political Relationship with the province's First Nations and aboriginal peoples.

## Private Sector Accountability for Public Resource Management

*As government backs away from the economy, then I think it's not unreasonable for the private sector to be more accountable.*

Senator Michael Kirby, Chair, Senate Committee on Banking, Trade and Commerce, 1996<sup>107</sup>

The accountability of private sector actors to the public has not expanded in a manner that corresponds to their increased role in the management of the province's public resources. There are a number of measures that could be adopted to address this gap. Steps to improve public and community access to information about the environmental impacts of economic activities are described in a number of chapters of this document, including Waste Management, Air Quality, and Water.

In addition, consideration should be given to amending the *Business Corporations Act* to require that provincially incorporated firms include information on the environmental aspects of their operations in their annual reports. Amendments of this nature were raised as a possibility for federally incorporated firms through the relevant federal legislation by Industry Canada in its December 1997 Sustainable Development Strategy.<sup>108</sup> The United States Securities Exchange Commission, for its part, has established a publicly accessible electronic inventory of environmental and health and safety information on publicly traded companies in the United States.<sup>109</sup>

### Recommendation:

22. The *Business Corporations Act* should be amended to require that provincially incorporated firms provide in their Annual Reports to shareholders information on:
  - violations of federal, provincial or municipal laws related to the protection of the environment, public health, public safety, or occupational health and safety, including the disclosure of fines and penalties, compensation payments and out-of-court settlements, over the reporting year;

- releases or transfers of pollutants from any facilities owned or operated by the corporation over the reporting year;
- total amounts, composition and fate of hazardous wastes generated by all facilities owned or operated by the corporation over the reporting year;
- total amounts, composition and fate of non-hazardous municipal solid waste generated by all facilities owned or operated by the corporation over the reporting year;
- emergency planning and risk management; and
- existing and potential future environmental liabilities.

23. Following the model of the United States Securities Exchange Commission, the Ontario Securities Commission should establish an electronically accessible inventory of the foregoing information for publicly traded companies in Ontario.

Over the past few years, a number of organizations have sought to strengthen the ability of shareholders in corporations to submit proposals at annual meetings regarding the operation and management of the corporations of which they are partial owners. This has included the environmental and social dimensions of company activities. The current provisions of the *Business Corporations Act* have been identified as containing potential barriers to such initiatives.<sup>110</sup> Concerns have also been raised regarding the inability of contributors to public sector pension funds to influence the social, environmental or ethical character of investments made by fund trustees.

**Recommendation:**

24. The *Business Corporations Act* should be amended to facilitate the presentation of shareholder proposals regarding the governance of corporations incorporated in Ontario, in a manner consistent with the recommendations of the Canadian Friends Service Committee with respect to the *Canada Business Corporations Act*.<sup>111</sup>

25. Legislation should be enacted to permit the contributors to public sector pension funds to give policy direction to pension fund trustees regarding the character of the investments which they make.

Environmental management issues within facilities are often closely related to occupational health and safety matters. Workers have the potential to play a significant role in ensuring the environmentally sound conduct of economic activities. The 1993 *Environmental Bill of Rights* provided protection to employees who report suspected violations of environmental laws by their employers. The rights of workers with respect to environmental issues should be further strengthened in a number of ways.

**Recommendation:**

26. The *Occupational Health and Safety Act* should be amended to provide a right to refuse environmentally damaging work, and to require the establishment of joint employee/management workplace environment committees, similar to the existing requirements for joint health and safety committees.

The potential accountability of private sector actors for their environmental performance was weakened significantly by the adoption of a wide-ranging policy on audit privilege by the Ministry of Environment and Energy in November 1995.<sup>112</sup> The policy states that the Ministry will not request information from self-initiated evaluations by regulated entities, except in exceptional circumstances. The Ontario policy has been widely criticized as being excessively broad in terms of the information that it protects, to the point of having the potential to undermine ongoing environmental law enforcement activities and lead to a decline in compliance.<sup>113</sup>

**Recommendation:**

27. The Ministry of the Environment's Guideline and Policy on Access to Environmental Evaluations should be revised to significantly narrow the types of information covered by the policy and the protection from prosecutions provided through it.<sup>114</sup>

**Environmental information and Community Right to Know**

The erosion of environmental science and monitoring activities in Ontario, and the termination of many of the province's environmental reporting activities raise serious questions about the ability of the public to understand the state of the province's environment, and to evaluate the impact of government decisions regarding its protection. Communities have a fundamental right to know about activities that place their safety, health and environment at risk. A range of specific measures in this regard is proposed in the relevant chapters of this document. In addition to these steps, several wider cross-cutting measures should be considered.

**Recommendations:**

28. The provincial government should commit to providing a comprehensive state of the environment report for the province every two years. This should include information on environmental quality, the status of natural resources, including biological diversity. Reporting activities should be linked to the development of sustainability objectives and indicators by the provincial government.
29. The *Environmental Bill of Rights* should be amended to permit the Office of the Environmental Commissioner to comment on the adequacy of the provincial government's state of the environment reports, the sustainability objectives and indicators established by the provincial government, and the impact of government decisions on the state of the province's environment and natural resources.

30. The province's major environmental and natural resources management statutes should be amended to require tabling of annual reports to the Legislature on the administration and enforcement of these Acts.<sup>115</sup>
31. The provincial government should commit to major re-investments in the province's environmental and natural resources science and monitoring capacity. Needs related to the fulfillment of provincial obligations to other levels of government (federal, municipal, and international) should be a high priority in this regard.

## **PART 2 - DEMOCRATIC PRINCIPLES AND ACCOUNTABILITY WITHIN SPECIFIC STATUTES**

### **Introduction**

Part I of this chapter addressed the broad issues of democracy and political accountability dealing with topics such as the rule of law, the appointment process, and access to information. This Part is more specific in that it reviews the need to reform a number of important environmental laws to further the principles of access to decision-making and accountability. Recent legislative and policy changes have adversely affected the extent to which these principles may currently be realized. These changes have had profound impact on the ability and capacity of Ontarians to access decision-making processes to protect the environment. The details are outlined below, although some of the highlights include:

- The *Environmental Assessment Act* was amended, undermining one of its key requirements - to assess the need for and alternatives to new projects and plans before they are undertaken. Now, the minister and the proponent can negotiate as to what should be included in the assessment as opposed to following legislative requirements.<sup>116</sup>
- On April 1, 1996, the *Intervenor Funding Project Act* was not renewed which, in effect, repealed the Act. The Act provided a mechanism for the public to be funded while appearing before certain tribunals. Now, the public has to secure its own funds, often when other private interest parties are fully funded, to hire lawyers and experts.
- The *Environmental Protection Act* was amended to provide for "standardized approvals." Standardized approvals are not really approvals at all. Rather, small facilities will simply send in paperwork indicating that they comply with a general regulation. Hence, no one will know what the facility is doing and it will be difficult to monitor compliance with the regulation. Also, the facility would be exempt from the public notice and comment rights (along with other rights) provided by the *Environmental Bill of Rights*.<sup>117</sup>

- The *Environmental Bill of Rights* 1993, has not been amended, but a number of initiatives have weakened the implementation of the law.

## **Environmental Assessment**

Environmental assessment (EA) is an environmental planning and decision-making procedure that analyzes proposed projects early on to identify and evaluate their environmental and social impacts. In the past, the rigor of the EA process has often helped to ensure that informed choices are made about proposed undertakings with the result being that environmentally unsound projects are rejected outright, and that other projects are carried out only under appropriate terms and conditions. Thus, the EA process plays an important role in holding governments accountable for their decisions to proceed with certain projects. It also enables those who will be affected by these projects to participate in the decision-making process.

Ontario's *Environmental Assessment Act*<sup>118</sup> (EAA) was first passed in 1975. The Act remained unchanged for over twenty years before being substantially amended in 1996.<sup>119</sup> Before being amended, Ontario's act was considered one of the most comprehensive in Canada because its legislated requirements forced a proponent to examine a broad range of factors in demonstrating that a proposal was environmentally sound, and most notably, whether there is a need for the project or whether there are alternatives to it. Now these legislated requirements may be varied on a project by project basis. The removal of this critical component means that Ontario can no longer uphold its claim of having one of the most comprehensive environmental assessment regimes.

The EAA only applies to public sector projects, those carried out by government agencies or crown corporations, and a few private sector projects that are specifically designated by regulation or Order-in-Council. Furthermore, many public sector projects are exempt from the requirements of the Act. However, those projects that are subject to the act require an EA approval before they may proceed.

The EA process is now a two-step procedure. The first step involves the proponent of the project submitting a proposal to the Minister of the Environment setting out the nature of the project and suggesting the scope of study that is appropriate in evaluating its environmental impacts. This new step is known as setting the terms of reference (TOR). Once approved, the TOR defines the range of factors that must be considered by the proponent in its EA study. While the Act lists specific criteria that should generally be considered in an EA, the Minister is empowered to vary these criteria on a case by case basis, including limiting what factors may apply. In effect, what goes into the environmental assessment document is negotiated between the minister and the proponent.

Once the proponent has completed the necessary research, studies and impact analysis of the project, it submits the EA document to the Minister for approval. The Minister may then either approve or reject the EA. Alternatively, the Minister may refer the matter to the EA Board to hold public hearings and make an independent decision on the merits of the proposal, or refer the matter to mediation. In either event, the Minister retains the power to overturn or alter a decision of the Board or Mediator as deemed appropriate.

## Elements of an Effective EA Regime

EA became popularized in 1969 with the passing of the *National Environmental Policy Act* in the United States. Since that time, EA has been introduced into many different jurisdictions throughout North America and the world. Almost thirty years of experience has resulted in some degree of consensus as to what constitutes an effective EA regime.<sup>120</sup> The most important facets include:

- it is a mandatory and independent process;
- the process is applied universally to all projects unless specifically exempted from the requirements through an open and fair manner;
- the essential elements are considered, including a project's purpose, the need for the project, alternatives to the project, alternative methods of carrying out the project, an analysis of the environmental impacts of each of the alternatives, and mitigation measures;
- there are clear and prescribed criteria to guide decision-making at all stages of the process;
- members of the public have meaningful opportunities to participate throughout the various decision-making stages;
- the EA process is carried out in a timely and efficient manner; and
- monitoring and other follow-up activities are carried out to ensure that a proponent is complying with the terms and conditions of the decision.

Ontario's amended EA process fails to meet these minimum requirements. The particular weaknesses and deficiencies are outlined below.

## Issues for EA Reform In Ontario

**Application of the Act and Exemptions:** The EAA does not apply to private sector proposals, except in rare instances when specific projects are designated by the Minister. Although the statute generally applies to all public sector projects, there is a broad list of exempted government agencies and projects. A particular public sector project may also be exempted from the requirements of the Act according to very broad and vague criteria and without public notice or comment requirements. Furthermore, the decision whether to exempt a project lies solely within the discretion of the Minister of the Environment.

For example, virtually all of the activities relating to the development of the nuclear industry in Ontario have been exempt from the EAA. These exemptions were not undertaken with full public consultation or the benefit of a broad public debate. More recently, the Taro landfill site, which is located in close proximity to the Niagara Escarpment, was granted an EA approval

without a hearing despite the fact that landfills have historically always been subject to a hearing and that there were numerous requests for a hearing in this case.<sup>121</sup>

**Recommendation:**

32. The *Environmental Assessment Act* should be amended in that:

- (a) the Act should apply to all environmentally significant public and private sector proposals;
- (b) an exemption from the requirements of the EAA should only be granted pursuant to clearly articulated statutory criteria and after there has been public comment on the proposed exemption; and
- (c) exemption requests should be scrutinized by an independent body for a recommendation to the Minister.

**Essential Elements of an EA and the Terms of Reference:** In the past, Ontario's EA Act mandated that a specific list of factors be examined in evaluating a proposal. This forced a proponent to demonstrate that a project was environmentally sound by considering: the need for and purpose of the project, alternatives to the project, alternative methods of carrying out the project, a detailed analysis of the environmental and social impacts of each of the alternatives, and means by which the environmental impacts could be mitigated. These essential elements are no longer required under the current act. As described above, each undertaking is evaluated according to its own, separate terms of reference (TOR), which establish the size and scope of the EA process. The contents of an EA listed in the Act are no longer binding and may be varied by the TOR. Thus, it is wide open for each proponent to define the scope of the project as they see fit.<sup>122</sup> Furthermore, the decision as to whether to approve the terms of reference lies solely within the discretion of the Minister of the Environment, again without reference to any criteria. The entire TOR process is thus arbitrary and inconsistent with the principles of accountability.

**Recommendation:**

33. All environmental assessments should be conducted pursuant to legislated criteria, which must include the purpose of, need for, and alternatives to the proposal. If Terms of Reference are to be developed, they should only be used to clarify the legislative criteria as it applies to that specific undertaking. The development of the Terms of Reference must involve public consultation.

**EA Approval and Board Hearings:** The decision as to whether to approve an undertaking under the EAA must be transparent and traceable. Under the current Act, the Minister is granted a broad range of discretion as to whether to approve an undertaking, refer the matter to mediation, or refer the approval, in whole or in part, to a hearing board with imposed timelines. The Minister may similarly deny a request to hold a hearing by a Board from a member of the public. Moreover, the Minister may unilaterally override the decision of a hearing Board. This broad range of discretion results in uncertainty and ambiguity and opens up the possibility of



arbitrary decisions being made. In contrast, the decision should be follow an open and fair process, with reasons based upon clearly articulated criteria.

The discretion embodied in the Minister is illustrated by two recent EA proposals: the Adams Mine Landfill and the Quinte West Landfill. The Adams Mine Landfill is a megaproject, projected to involve 20 million tonnes of garbage, which is to be shipped by rail over 600 kilometres and dumped into an abandoned mine pit in Northern Ontario. Despite the enormous implications this proposal has on waste reduction initiatives and energy use, the hearing was limited in scope to one narrow issue - whether the hydraulic containment system was adequate to protect the surrounding groundwater. There was never any public debate as to the need for this project or alternatives to it. By contrast, the Quinte West Landfill, which, although environmentally significant, is a modest proposal in comparison to the Adams Mine project, has been subjected to a full scale hearing involving all the traditional issues. This inconsistent application of the Act undermines its credibility and effectiveness.

**Recommendation:**

34. Decisions as to whether to approve the undertaking, refer the matter to mediation, refer the matter to a hearing board, or alter the board decision should be made with reference to clearly articulated criteria.

**Public Consultation and Independent Review:** Although the EAA currently provides for public consultation, the requirement is very generally worded.<sup>123</sup> Neither the Minister nor the Assessment Board is explicitly required to consider the extent or effectiveness of the proponent's consultation in approving the EA, suggesting that there are no ramifications to the proponent if meaningful consultation is not carried out. Public participation should be clearly stipulated to require early and meaningful consultation throughout the EA process, require timely and appropriate notice provisions well before all key decision-making points, ensure free access to all relevant information, and provide for participant and intervenor funding (discussed in more detail elsewhere in this paper).

**Recommendation:**

35. Early and meaningful public consultation must be required throughout the EA process, including timely notice provisions, free access to relevant information, and the provision of participant and intervenor funding where appropriate. There must be ramifications for the proponent in terms of receiving an approval if effective public participation is not provided for.

**Timely and Efficient Decision Making:** In the past, some environmental assessment processes have taken an inordinate amount of time to complete, although some delays may be attributed to a proponent's own activities. Realistic and fair timelines should be implemented to ensure that the EA process proceeds in a timely manner. At the same time, it must be recognized that a thorough and comprehensive review is a fundamental part of an environmental assessment. This review requires adequate time to be conducted effectively, which may include a hearing in many instances.

**Recommendation:**

36. Realistic timelines that are fair to all parties and allow for a thorough and comprehensive review of the EA should be implemented to ensure that the EA process proceeds in a timely manner.

**Class Environmental Assessments:** A class environmental assessment provides a streamlined approval process for those activities that are similar in nature and occur frequently, such as minor road widenings or sewage treatment plant expansions. The class EA process is only appropriate for those activities that can be characterized as minor and have insignificant, predictable, and mitigable impacts on the natural environment. However, the EAA does not restrict a class EA approval to these types of projects. Furthermore, there needs to be a statutory requirement to include a "bump-up" provision to enable a class EA to be turned into a full scale individual EA in those situations where the environmental impacts of a proposal do not meet the class EA criteria. Finally, the initial approval of the class EA must comply with all the requirements for an individual EA.

**Recommendation:**

37. The approval of a class EA must be carried out in accordance with that of a full individual EA. Class EA's must be limited by statute to minor activities that have insignificant, predictable, and mitigable impacts on the environment. Furthermore, there needs to be a statutory requirement to include a "bump-up" provision in all class EA's.

**Taking EA the Next Step:** An effective EA process would include additional features that have never been included in or properly practised under the EAA. It would require follow-up and effectiveness monitoring to ensure that the proponent is complying with the approval. It would also provide for a mechanism of applying the EA process to government policies and programmes that may have significant implications for the natural environment. A further important requirement is the need to address cumulative and synergistic effects during the analysis stage. Finally, there is a need to maintain a degree of objectivity throughout the process. An independent advisory council, much like the former Environmental Assessment Advisory Committee consisting of individuals with experience in the field of EA, should be constituted to advise the Minister when appropriate.

**Recommendation:**

38. The EAA should be amended to add the following features:
- (a) a requirement for follow-up and effectiveness monitoring;
  - (b) a mechanism to evaluate government policies and programs;
  - (c) inclusion of consideration of cumulative and synergistic affects; and
  - (d) the establishment of an independent advisory council to assist the Minister.

## **Intervenor Funding**

Intervenor funding provides funds to individuals and groups so that they can participate effectively in decision-making processes. The funding is generally spent to hire scientific and legal experts to assist participants with their case and cover other disbursements. This levels the playing field to some extent, ensuring that one side is not restrained from presenting its arguments fully simply due to a lack of financial resources. The cost of intervenor funding is usually borne by the proponent.

Experience demonstrates that intervenor funding ensures the integrity and soundness of the decision-making processes. It also increases efficiency. With proper resources, parties are able to scope or settle issues in dispute at the pre-hearing stage, or even settle upon agreed-to conditions of approval, dispensing with the need for a hearing altogether. In those instances when a hearing is necessary, represented parties enable the process to run more smoothly and provide decision-makers with the information they need to make a best decision in the public interest.

Ontario previously had an *Intervenor Funding Project Act*, but it expired in April of 1996 and was not renewed. However, the Act only provided funding in limited situations, such as matters before the Environmental Assessment Board, the Ontario Energy Board and the Consolidated Hearings Board.

### **Recommendation:**

39. Intervenor funding should be renewed to enable individuals and groups involved in environmental decision-making procedures to participate effectively. Funding should be borne by the proponent and should apply to a variety of decision-making processes, and at least to the Environmental Assessment Board, the Environmental Appeal Board, the Ontario Energy Board, the Ontario Municipal Board, the Consolidated Hearings Board, among others.

## **Environmental Approvals**

The primary means of regulating pollution control in Ontario is through issuance of permits under environmental legislation such as the *Environmental Protection Act* and the *Ontario Water Resources Act*. These statutes contain a general prohibition clause that restricts certain activities unless the actor acquires the necessary permit first. The permits are only issued if the actor can demonstrate that their operation will comply with predetermined standards. Penalties and sanctions back the permit provisions if an operator fails to obtain a permit or breaches its conditions.

To be effective, the permit system depends upon proper standards being set. Standards must be set in an objective and open manner to ensure that pollution discharges will not adversely affect the environment and human health. They should also be based upon sound science and the precautionary principle. Furthermore, standards should reflect the needs of sensitive populations in our society, such as the elderly, aboriginal peoples, children, and wildlife.

The government must adequately scrutinize applications for permits. Proposals that have the potential to adversely affect the environment must be given strict terms and conditions to ensure that these effects are mitigated, or the proposal must be rejected outright. Furthermore, this review process plays an important proactive role in identifying potential means of further reducing pollution output.

In certain limited circumstances, it may be appropriate to dispense with the licensing system and employ a "permit by rule" or "standardized approval" process. This system entails exempting operators from obtaining a permit if they can demonstrate that their operation falls within prescribed standards. The onus shifts from the government to the operator to ensure that the operation complies with the standard. However, standardized approvals are only appropriate for activities that are simple and routine and have only very minor impacts on the natural environment and human health. Furthermore, there must be an adequate auditing system in place, backed by necessary sanctions, to ensure that operators are meeting the prescribed standards.

Limited experience with some laws and regulations that have incorporated the "permit-by-rule" has already provided an indication of the potential problems with this approach. For example, some 3Rs regulations exempt recyclers from obtaining an approval if they meet the prescribed conditions. It was this regulation that applied to Plastimet Inc. in Hamilton. There, over 400 tonnes of PVC plastic caught on fire, burning for four days and spreading toxic chemicals into the environment. Similarly, there have been numerous occurrences of unregulated tire dumps catching on fire.

Standardized approvals were a main thrust behind Bill 57, a bill to amend the *Environmental Protection Act*. The amendments allow for the development of a more comprehensive standardized approval regime for air, water and waste approvals, although the implementing regulations have yet to be promulgated. Potentially, hundreds, if not thousands, of approvals would no longer be required. Moreover, because those approvals would no longer be required, the requirements under the *Environmental Bill of Rights* that otherwise would be required would no longer apply.

**Recommendation:**

40. The basic prohibition on pollution discharges without a permit should be maintained. Permits should only be issued if it can be demonstrated that there will be no adverse effect on the natural environment. Standards must be set in a fair and open manner, on the basis of sound science and the precautionary principle, and reflect the needs of sensitive populations, especially children.

The government must scrutinize applications for pollution permits adequately to ensure there will be no adverse effect to the environment. Standardized approvals may be appropriate for activities that are simple and routine and have only very minor impacts on the natural environment and human health as long as an adequate auditing scheme is also put in place. The development of standardized approvals must be undertaken with full public participation.

## **Environmental Monitoring, Compliance, and Enforcement**

A law is of little value unless it is enforced. There must be a realistic threat that a potential violator will risk prosecution if we are to ensure that operators comply with the law. One study indicates that the primary motivating factor behind companies implementing environmental protection measures is to comply with environmental regulations.<sup>124</sup>

Government inspectors, abatement officers, investigators, and prosecutorial staff are all needed to carry out enforcement activities. The government must ensure that there is adequate trained staff and resources to carry out these activities. The public must also be able to access information regarding compliance with environmental laws.

### **Recommendation:**

41. The government must ensure that there is adequate trained staff and resources to carry out environmental enforcement activities effectively. The investigations branch should resume publishing enforcement statistics on an annual basis.

## **Environmental Bill of Rights**

The *Environmental Bill of Rights* (EBR) was passed in 1993, giving the people of Ontario the right and the tools to become involved in government decisions that affect the environment. The provisions of the EBR increase government accountability and ensure the public's right to participate in environmental decision-making. Some of the key rights include:

- the right to receive notice of proposed decisions (such as new approvals, policies, regulations and statutes) through the environmental registry and have the opportunity to voice one's concerns about those proposed decisions;
- the right to apply to have existing approvals, policies, statutes and regulations reviewed to determine whether there is a need to update them;
- the right to request leave to appeal the granting of certain instruments;
- the right to apply for an investigation if the person thinks someone is violating an environmental statute;
- the right to sue in civil courts for a breach of an environmental law; and
- the right to blow the whistle on an employer without the threat of reprisal.

Also, the EBR established the Office of the Environmental Commissioner of Ontario, an independent agency that monitors the government's environmental performance and reports directly to the Legislature.

**The Environmental Commissioner's Office:** The Environmental Commissioner's Office is vital to ensuring that the spirit of the EBR is followed by the various government ministries. The ECO is akin to an environmental ombudsman. In order to be effective, the ECO office must maintain a degree of independence from the government. It must also be given sufficient financial and human resources to carry out its mandate effectively.

**Recommendation:**

42. The Environmental Commissioner's Office should be maintained and continue to report directly to the legislature. The ECO must be given sufficient funding and resources to carry out its mandate effectively.

**The Environmental Registry:** An important aspect of the EBR is the Environmental Registry. The registry is an electronic service that provides access to information regarding environmentally significant activities by the government, including notice of all proposed laws, regulations, and policies, and publication of all environmental approvals that are designated, such as certificates of approval issued under the EPA. The registry thus provides an important conduit for the public to obtain information on environmental decision-making.

The registry is currently an internet based service. It lists all laws, policies, and approvals. Despite its clear benefits and vast improvement over the practices prior to the EBR, the registry can be improved. The brief summary that is included with each posting is too abbreviated to be of much use to most users. The registry needs to be made more user friendly by providing means of searching postings by geographic location, type of instrument, and type of proponent. Very significant proposals could also be flagged and brought to the attention of users in a variety of ways.

**Recommendation:**

43. While the environmental registry provides an invaluable service, it could be improved by providing a wide range of searching options and ensuring that accurate precise summaries are included for each posting.

**Requests for Review and Investigations:** Two essential elements of the EBR are the request for review and request for investigation provisions, which force the government to address a citizen's concerns with a perceived environmental problem. These instruments are being compromised in that there is no requirement that the government staff or agency that conducts the review or investigation is different from the one that made the original decision.

Furthermore, the ECO depends upon concerned citizens to bring issues to its attention before being able to take any action. In some instances, a concerned citizen may fail to raise the issue, either out of fear of becoming involved or lack of connection to the issue. The ECO's mandate should be expanded to enable it to undertake requests for review, requests for investigations, and to comment on proposals affecting legislation and regulations under its mandate in appropriate circumstances.

**Recommendation:**

44. Requests for review and investigation should be carried out by different government staff or a different department than the staff that made the original decision.

The Environmental Commissioner of Ontario should be able to undertake requests for review, requests for investigation, and to comment on proposals affecting legislation and regulations under its mandate.

**Leave to Appeal Provisions of the EBR:** The EBR allows a citizen to appeal a decision by a government official where that decision may be unreasonable. Prior to the EBR, only the applicant for an approval had the right to appeal the decision of the governmental agency to a tribunal, such as the Environmental Appeal Board. Under the EBR, a citizen can ask a tribunal for leave or permission to appeal, and if successful, can then appeal the matter.

The test for getting leave is quite onerous, which explains why there have only been three successful attempts under these provisions of the law. These provisions would be significantly improve if there was better clarity as to the test that is required and the kind of information that must be put forth to satisfy the test. In addition, the 15-day deadline for appeal is too short.

**Recommendation:**

45. The leave to appeal provisions should be clarified to better inform the public as to what information is required to satisfy the test. There should be also some provision for extending the 15-day deadline for filing the leave to appeal.

**The Right to Sue:** Other instruments under the EBR enable citizens to take action when they have good reason to believe that the environment is being threatened. The EBR creates a remedy that enables a citizen to go to court to obtain a remedy for potential environmental harm, including an injunction where appropriate. Unfortunately, these provisions have not been used with great success since the EBR was proclaimed in 1994.

The provisions include a set of onerous preconditions that must be met before they may be utilized. Experience appears to be demonstrating that these preconditions are too onerous, dissuading citizens from enforcing their rights. These provisions should be reviewed to determine whether the preconditions should be made less onerous in order to encourage citizens to use them more often.

Another provision ensures that a barrier to lawsuits, the old public nuisance rule, no longer applies. The public nuisance rule stated that when a community is affected by an environmental matter as a whole, then no one individual could sue (since the wrong was being committed against the community, not individuals, and as such, only governments could sue). Only two court actions have been initiated using these provisions.

**Recommendation:**

46. The right to sue provisions of the EBR should be reviewed in order to determine whether the preconditions are too onerous. If so, they should be amended accordingly.

**Instrument Classification Regulations:** The EBR was phased in over a period of four years. While the Act only applied to the Ministry of the Environment at first, it now applies to several ministries. However, until those ministries promulgate an instrument classification regulation that sets out which provisions of which acts under their jurisdiction will apply to the Act, the scope of the EBR remains extremely limited. Some ministries have been unreasonably slow in developing the required regulations, while others have not included all the required provisions in their proposed regulation. For example, the Ministry of Natural Resources was subject to the EBR on April 1, 1996, and has still failed to pass an instrument classification regulation for statutes under its jurisdiction.<sup>125</sup> This outcome is unacceptable as it leaves the citizens of Ontario without the right to exercise important rights under the Act.

**Recommendation:**

47. There should be ramifications for ministries that do not promulgate an instrument classification regulation within 1 year. After an extended period of time, the Minister of the Environment should be empowered to impose a classification regulation upon a delinquent Ministry.

**Five Year Review of the EBR:** The EBR was enacted in late 1993. Hence, it has been five years since it has been in force. In some respects, the law has worked well and in others, it has not. One of the unique features of the law is that it was drafted by a task force representing different interests in society with very clear terms of reference.

For its five-year review, there should be a workshop, with sufficient research, to assess the strengths and weaknesses of the law. This workshop should be sponsored by the ECO. In light of the findings of the workshop, there should be intense consultation, with equal representation from the non-government groups, to assess if the EBR should be updated and what are the most appropriate changes. Terms of reference should be drawn up with the specific mandate to strengthen, and not dilute, the EBR.

**Recommendation:**

48. The ECO should sponsor a workshop, with appropriate research, assessing the EBR in terms of the past five years. Terms of reference should then be drawn up giving a mandate to a committee made up of equal representatives of public interest groups to strengthen the EBR in accordance with the general findings of the ECO workshop.



## SUMMARY OF RECOMMENDATIONS

1. The Rules of Procedure of the Legislature should be amended to permit the disallowance of the introduction, amendment or repeal of regulations, as per the 1988 recommendations of the Standing Committee on Regulations and Private Acts. . The use of omnibus bills, making substantive amendments to more than one statute, should be barred.
2. Following the model of the House of Commons, the Rules of Procedure of the Legislature should be amended to permit the conduct of policy studies by standing committees of the Legislature, and to require the government to table responses to standing committee reports, when requested to do so by the committees.
3. An independent commission should be established to conduct a review of the procedures, functions and structure of the Legislature. The Commission should present its report and recommendations within one year of its establishment. Its mandate should recognize deliberation as the central function of the Legislature, and that other interests, including governmental convenience, are secondary.
4. A “Rule of Law Restoration Act” should be enacted to remove from legislation enacted over the past four years all:
  - crown immunity clauses;
  - clauses stating that regulations can override the provisions of statutes;
  - clauses exempting the making of regulations, guidelines or policies by the Lieutenant Governor in Council, Ministers and Agencies, Boards and Commissions from the requirements of the *Regulations Act*;
  - clauses permitting the setting of tax rates by the Minister of Finance or Lieutenant Governor in Council, rather than the Legislature;
  - legislation permitting the alteration of statutes, for any reason, without the approval of the Legislature; and
  - clauses permitting the delegation of decision-making powers to persons who are not public entities or officials.from legislation enacted over the past four years.
5. A “Government Accountability Restoration Act” should be adopted to apply the requirements of the: *Environmental Bill of Rights*; *Ombudsman Act*; *Freedom of Information and Protection of Privacy Act*; *Audit Act*; *Environmental Assessment Act*; and *French Language Services Act* to all delegated regulatory organizations such as the Technical Standards and Safety Authority, other private or non-governmental organizations to whom provincial governmental functions or decision-making authority have been delegated, and corporations in which the Crown in Right of Ontario is the primary or sole shareholder. Provision should be made to enable responsible Ministers to give policy direction to these entities in a manner similar to section 10 of the *Power Corporation Act*. **Check Section**

6. The *Environmental Bill of Rights* model of a public registry, and notice and public comment period requirements should be extended to all proposals to introduce, amend or repeal regulations and major public policies through amendments to the *Regulations Act*.
7. The Red Tape Commission's Regulatory Impact and Competitiveness test for new regulations should be withdrawn.
8. A new policy regarding the introduction, amendment or repeal of major regulations, policies and programmes should be adopted by the Government of Ontario. This should emphasize the achievement of net gains to the social, economic and ecological sustainability of Ontario society.
9. The *Audit Act* should be amended to include reporting on status, condition and management of the province's natural resources, and on environmental liabilities and environmental deficits in the mandate of the Provincial Auditor.
10. The provincial government should establish an independent task force to review provincial subsidies, grants, tax incentives and other provincial fiscal programmes to identify barriers and disincentives to sound environmental practices.
11. Amend the *Freedom of Information and Protection of Privacy Act* and the *Municipal Freedom of Information and Protection of Privacy Act* to:
  - remove the authority of the heads of agencies to deny access to records on basis that requests are "frivolous and vexatious." This should be replaced with a provision permitting the Freedom of Information Commissioner to authorize an agency or institution to disregard a request for access on the basis that the request is frivolous or vexatious;
  - provide that the first two hours of search time in response to an information request be without cost;
  - provide that a fee of not more than \$5 be levied when access decisions are appealed.
12. The FOIPPA should be amended to:
  - limit the exemptions from the Act contained in sections 12 to 19 as recommended by the Standing Committee on the Legislative Assembly; and
  - place the onus on agencies denying access to a record on the basis of the exemptions provided in sections 13, 14, 15, 17, 18, 20 and 21 of the Act, that there is a "compelling public interest" in denying access. The public interest override provision should be extended to section 12 (cabinet deliberations) of the Act.
13. Section 145 of the *Mining Act*, as amended through Bill 26, should be deleted.
14. Legislation should be adopted regarding appointments to regulatory agencies, boards and commissions. This should provide that:

- proposed appointments, including those to quasi-judicial tribunals, be reviewed by a committee of the Legislature prior to their establishment;
  - the terms for appointments should be fixed, not at pleasure, with removal only for cause;
  - there be strict conflict of interest requirements forbidding the appointment to that body of individuals employed by, or who have represented, economic interests within the jurisdiction of a regulatory body within the past five years;
  - appointments of former ministers or officials of agencies within the jurisdiction of regulatory bodies be prohibited for five years after their departure from the agency; and
  - independent advisory committees be established to provide nominations for appointments to regulatory tribunals, similar to the system that was been created for provincial court judges.
15. The Minister of the Environment should establish the Environmental Council, provided for by Part VI of the *Environmental Protection Act*, to advise the Minister on the results of current research related to pollution and the natural environment, and other matters affecting the quality of the environment.
16. The Government of Ontario should establish an independent commission to inquire into and consider any matter relating to:
- the reform of the law having regard to the statute law, the common law and judicial decisions;
  - the administration of justice;
  - judicial and quasi-judicial procedures under any Act; or
  - any subject referred to it by the Legislature or the Attorney-General.
17. Legislation should be adopted requiring that all government advertising be reviewed by the Legislative Assembly's Integrity Commissioner to ensure that it is informational, rather than partisan in nature. Party and election finance issues should be included in the mandate of the Commission on the Legislative Assembly proposed under Recommendation 3.
18. The *Municipal Act* should be amended to ensure openness in municipal government processes and the functional operation of municipal councils.
19. The *Municipal Act* should be amended to expand the authority of municipal governments to act on environmental matters. The Province should be prepared to provide support for such initiatives through the provision of information and technical assistance and support.
20. The *Municipal Act* should be amended to forbid amalgamation or dissolution of municipalities without the consent of the affected councils.
21. The Government of Ontario should re-affirm its commitment to its 1991 Statement of Political Relationship with the province's First Nations and aboriginal peoples.

22. The *Business Corporations Act* should be amended to require that provincially incorporated firms provide in their Annual Reports to shareholders information on:
  - violations of federal, provincial or municipal laws related to the protection of the environment, public health, public safety, or occupational health and safety, including the disclosure of fines and penalties, compensation payments and out-of-court settlements, over the reporting year;
  - releases or transfers of pollutants from any facilities owned or operated by the corporation over the reporting year;
  - total amounts, composition and fate of hazardous wastes generated by all facilities owned or operated by the corporation over the reporting year;
  - total amounts, composition and fate of non-hazardous municipal solid waste generated by all facilities owned or operated by the corporation over the reporting year;
  - emergency planning and risk management; and
  - existing and potential future environmental liabilities.
23. Following the model of the United States Securities Exchange Commission, the Ontario Securities Commission should establish an electronically accessible inventory of the foregoing information for publicly traded companies in Ontario.
24. The *Business Corporations Act* should be amended to facilitate the presentation of shareholder proposals regarding the governance of corporations incorporated in Ontario, in a manner consistent with the recommendations of the Canadian Friends Service Committee with respect to the *Canada Business Corporations Act*.
25. Legislation should be enacted to permit the contributors to public sector pension funds to give policy direction to pension fund trustees regarding the character of the investments which they make.
26. The *Occupational Health and Safety Act* should be amended to provide a right to refuse environmentally damaging work, and to require the establishment of joint employee/management workplace environment committees, similar to the existing requirements for joint health and safety committees.
27. The Ministry of the Environment's Guideline and Policy on Access to Environmental Evaluations should be revised to significantly narrow the types of information covered by the policy and the protection from prosecutions provided through it.
28. The provincial government should commit to providing a comprehensive state of the environment report for the province every two years. This should include information on environmental quality, the status of natural resources, including biological diversity. Reporting activities should be linked to the development of sustainability objectives and indicators by the provincial government.
29. The *Environmental Bill of Rights* should be amended to permit the Office of the Environmental Commissioner to comment on the adequacy of the provincial government's state of the environment reports, the sustainability objectives and indicators

established by the provincial government, and the impact of government decisions on the state of the province's environment and natural resources.

30. The province's major environmental and natural resources management statutes should be amended to require tabling of annual reports to the Legislature on the administration and enforcement of these Acts.
31. The provincial government should commit to major re-investments in the province's environmental and natural resources science and monitoring capacity. Needs related to the fulfillment of provincial obligations to other levels of government (federal, municipal, and international) should be a high priority in this regard.
32. The Environmental Assessment Act should be amended in that:
  - (a) the Act should apply to all environmentally significant public and private sector proposals;
  - (b) an exemption from the requirements of the EAA should only be granted pursuant to clearly articulated statutory criteria and after there has been public comment on the proposed exemption; and
  - (c) exemption requests should be scrutinized by an independent body for a recommendation to the Minister.
33. All environmental assessments should be conducted pursuant to legislated criteria, which must include the purpose of, need for, and alternatives to the proposal. If Terms of Reference are to be developed, they should only be used to clarify the legislative criteria as it applies to that specific undertaking. The development of the Terms of Reference must involve public consultation.
34. Decisions as to whether to approve the undertaking, refer the matter to mediation, refer the matter to a hearing board, or alter the board decision should be made with reference to clearly articulated criteria.
35. Early and meaningful public consultation must be required throughout the EA process, including timely notice provisions, free access to relevant information, and the provision of participant and intervenor funding where appropriate. There must be ramifications for the proponent in terms of receiving an approval if effective public participation is not provided for.
36. Realistic timelines that are fair to all parties and allow for a thorough and comprehensive review of the EA should be implemented to ensure that the EA process proceeds in a timely manner.
37. The approval of a class EA must be carried out in accordance with that of a full individual EA. Class EA's must be limited by statute to minor activities that have

insignificant, predictable, and mitigable impacts on the environment. Furthermore, there needs to be a statutory requirement to include a "bump-up" provision in all class EA's.

38. The EAA should be amended to add the following features:
- (a) a requirement for follow-up and effectiveness monitoring;
  - (b) a mechanism to evaluate government policies and programmes;
  - (c) inclusion of consideration of cumulative and synergistic affects; and
  - (d) the establishment of an independent advisory council to assist the Minister.

The government must ensure that there is adequate trained staff and resources to carry out environmental enforcement activities effectively. The investigations branch should resume publishing enforcement statistics on an annual basis.

39. Intervenor funding should be renewed to enable individuals and groups involved in environmental decision-making procedures to participate effectively. Funding should be borne by the proponent and should apply to a variety of decision-making processes, and at least to the Environmental Assessment Board, the Environmental Appeal Board, the Ontario Energy Board, the Ontario Municipal Board, the Consolidated Hearings Board, among others.

40. The basic prohibition on pollution discharges without a permit should be maintained. Permits should only be issued if it can be demonstrated that there will be no adverse effect on the natural environment. Standards must be set in a fair and open manner, on the basis of sound science and the precautionary principle, and reflect the needs of sensitive populations, especially children.

The government must scrutinize applications for pollution permits adequately to ensure there will be no adverse affect to the environment. Standardized approvals may be appropriate for activities that are simple and routine and have only very minor impacts on the natural environment and human health as long as an adequate auditing scheme is also put in place. The development of standardized approvals must be undertaken with full public participation.

41. The government must ensure that there is adequate trained staff and resources to carry out environmental enforcement activities effectively. The investigations branch should resume publishing enforcement statistics on an annual basis.
42. The Environmental Commissioner's Office should be maintained and continue to report directly to the legislature. The ECO must be given sufficient funding and resources to carry out its mandate effectively.
43. While the environmental registry provides an invaluable service, it should be improved by providing a wide range of searching options and ensuring that accurate precise summaries are included for each posting.

44. Requests for review and investigation should be carried out by different government staff or a different department than the staff that made the original decision.

The Environmental Commissioner of Ontario should be able to undertake requests for review, requests for investigation, and to comment on proposals affecting legislation and regulations under its mandate.

45. The leave to appeal provisions should be clarified to better inform the public as to what information is required to satisfy the test. There should be also some provision for extending the 15-day deadline for filing the leave to appeal.

46. The right to sue provisions of the EBR should be reviewed in order to determine whether the preconditions are too onerous. If so, they should be amended accordingly.

47. There should be ramifications for ministries that do not promulgate an instrument classification regulation within one year. After an extended period of time, the Minister of the Environment should be empowered to impose a classification regulation upon a delinquent Ministry.

48. The ECO should sponsor a workshop, with appropriate research, assessing the EBR in terms of the past five years. Terms of reference should then be drawn up giving a mandate to a committee made up of equal representatives of public interest groups to strengthen the EBR in accordance with the general findings of the ECO workshop.

## ENDNOTES

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- <sup>1</sup>F.F. Schindler, Responsible Government in Ontario, (Toronto: University of Toronto Press, 1969), pg.viii.
- <sup>2</sup>D.Macdonald, R.Nadarajah, and M.Winfield, Our Future Our Health! A Statement of Concern by Ontario Environmental Organizations (Toronto: Ontario Environmental Protection Working Group, March 1997), pp.13-14.
- <sup>3</sup>Quoted in Standing Committee on Regulations and Private Bills, Second Report (Toronto: Legislative Assembly of Ontario, 1988), pg.66.
- <sup>4</sup>Castrilli and Winfield, The Ontario Regulation and Policy-Making Process in a Comparative Context: Exploring the Possibilities for Reform (Toronto: ECO, 1996), pg.7.
- <sup>5</sup>Ibid.
- <sup>6</sup>See, for example: Bill 26 (the *Savings and Restructuring Act, 1996*) amendments to the *Public Lands Act*, the *Lakes and Rivers Improvements Act*, and the *Forest Fires Prevention Act*; the Bill 57 (*Environmental Approvals Process Improvements Act, 1997*) amendments to the *Environmental Protection Act* and the *Ontario Water Resources Act*; and the Bill 76 (the *Environmental Assessment Process Consultation and Improvements Act, 1996*) amendments to the *Environmental Assessment Act*.
- <sup>7</sup>See for example, Bill 26, *The Savings and Restructure Act, 1996*, and Bill 25, *The Red Tape Reduction Act, 1998*.
- <sup>8</sup>See Bill 57 (*Environmental Approvals Process Improvements Act, 1997*) amendments to the *Environmental Protection Act* and the *Ontario Water Resources Act*.
- <sup>9</sup>See for example, the Bill 66 (the *Red Tape Reduction (Ministry of the Environment and Energy) Act*) amendments to the *Pesticides Act*; the Bill 120 (the *Red Tape Reduction (Ministry of Northern Development and Mines) Act, 1997*) amendments to the mine closure provisions of the *Mining Act*.
- <sup>10</sup>See for example, the Bill 57 (the *Environmental Approvals Process Improvements Act, 1997*) amendments to the *Environmental Protection Act* and the *Ontario Water Resources Act*.
- <sup>11</sup>The most prominent example of such a measure is Bill 160, *An Act to Reform the Education System, 1997*, Division B, s.257.12 with respect to education property tax levels. The Bill also provides for the allocation of funds appropriated by the legislation by the Lieutenant-Governor in Council (Division A, s.234).
- <sup>12</sup>G.White, The Ontario Legislature: A Political Analysis (Toronto: University of Toronto Press, 1989), pp.142-152.
- <sup>13</sup>See Bill 25, *The Red Tape Reduction Act, 1998*, Schedule C: "Statute and Regulation Revision Act, 1998." See also "Submission by the Canadian Environmental Law Association to the Standing Committee on the Administration of Just, Legislative Assembly of Ontario Re: Bill 25, Red Tape Reduction Act, 1998" (Toronto: CELA, October 19, 1998).
- <sup>14</sup>For a detailed discussion of the TSSA see M.Winfield and G.Jenish, Ontario's Environment and the 'Common Sense Revolution': A Second Year Report (Toronto: CIELAP, 1997), pp.114-124.
- <sup>15</sup>Open Doors - Ontario's Environmental Bill of Rights: Annual Report 1997 (Toronto: Environmental Commission of Ontario, April 1998), pp.37-45.
- <sup>16</sup>See Bill 52, *The Aggregate and Petroleum Resources Statute Law Amendment Act, 1996*.
- <sup>17</sup>Ibid.
- <sup>18</sup>M.Winfield and G.Jenish, Ontario's Environment and the Common Sense Revolution: A Third Year Report (Toronto: CIELAP, June 1998), pp.99-100.
- <sup>19</sup>This is a result of the implementation of the Bill 26 (*Savings and Restructuring Act, 1996*) amendments to the *Public Lands Act* and the *Rivers and Lakes Improvements Act*.
- <sup>20</sup>Winfield and Jenish, Ontario's Environment and the CSR: A Second Year Report, pp.90-91.
- <sup>21</sup>Standing Committee on the Legislative Assembly, Review of the Freedom of Information and Protection of Privacy Act, 1987 (Toronto: Legislative Assembly of Ontario, December 1991).
- <sup>22</sup>*Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, Ch.F.41. ss.12-23.



- <sup>23</sup>Standing Committee on the Legislative Assembly, Report on the Municipal Freedom of Information and Protection of Privacy Act, 1989 (Toronto: Legislative Assembly of Ontario, 1994).
- <sup>24</sup>Letter Re: Bill 26, Savings and Restructuring Act, 1995, (Schedules K and O (*Mining Act* amendments)) from Tom Wright, Freedom of Information and Privacy Commissioner to Jack Carroll, MPP, Chair, Standing Committee on General Government, December 18, 1998. The Commissioner also raised concerns regarding Schedules F (*Independent Health Facilities Act* amendments), G (*Ontario Drug Benefit Act* amendments), H (*Health Insurance Act*). See Letter Re: Bill 26, *Savings and Restructuring Act, 1995*, from Tom Wright, Freedom of Information and Privacy Commissioner to Jack Carroll, MPP, Chair, Standing Committee on General Government, December 21, 1996.
- <sup>25</sup>Canadian Institute for Environmental Law and Policy Submission to the Standing Committee on General Government Re: Bill 26, The Savings and Restructuring Act, 1996 (Toronto: CIELAP, December 1995).
- <sup>26</sup>J.Rusk, "Ontario to fight red tape with controls on regulations," The Globe and Mail, July 18, 1996.
- <sup>27</sup>Red Tape Commission, Cutting the Red Tape Barriers to Jobs and Better Government (Toronto: Cabinet Office, January 1997), pg.17-18.
- <sup>28</sup>J.Castrilli and M.Winfield, The Ontario Regulation and Policy-Making Process in a Comparative Context: An Exploration of the Possibilities for Reform (Toronto: Environmental Commissioner of Ontario, October 1996), pp.33-38.
- <sup>29</sup>Standing Committee on Regulations and Private Bills, Second Report (Toronto: Legislative Assembly of Ontario, 1988), pp.12-16.
- <sup>30</sup>Standing Committee on Environment and Sustainable Development The Public Interest Must Come First (Ottawa: House of Commons, May 1998), Recommendation 22. For detailed critiques of cost/benefit tests, see Castrilli and Winfield, The Ontario Regulation and Policy-Making Process in a Comparative Context, note 329.
- <sup>31</sup>Red Tape Commission, Cutting the Red Tape Barriers to Jobs and Better Government (Toronto: Cabinet Office, January 1997).
- <sup>32</sup>Specific instances are under investigation through FOI requests.
- <sup>33</sup>Letter to all Ministers from Frank Sheehan, Chair, Red Tape Commission, dated June 16, 1997.
- <sup>34</sup>M.Mittelsteadt, "Red tape boss asked ministry to lift charge against landfill firm," The Globe and Mail, November 7, 1998.
- <sup>35</sup>Winfield and Jenish, Ontario's Environment and the CSR: A Second Year Report, pg.31.
- <sup>36</sup>In February 1998, the past president of the Aggregate Producers Association of Ontario was appointed to the Commission. Aggregate extraction is seen as a major threat to the integrity of the escarpment. T.Boyle, "Opposition criticizes appointments," The Toronto Star, April 16, 1998.
- <sup>37</sup>I.Urquhart, "Power play beneath the surface," The Toronto Star, January 24, 1998.
- <sup>38</sup>Ibid.
- <sup>39</sup>Letter to Agency Reform Commission, Re: Regulatory and Adjudicative Agency Reform Consultation from R.L. Jamieson, Ombudsman, November 14, 1997.
- <sup>40</sup>L.Hurst, "Clear-cut mandate," The Toronto Star, June 15, 1996.
- <sup>41</sup>Dissolved September 12, 1995.
- <sup>42</sup>Ministry of Environment and Energy, "Minister Sunsets Three Committees," Media Release, September 29, 1995.
- <sup>43</sup>See, for example, ss.5 and 8 of the Bill 57, *the Environmental Approvals Improvement Act, 1997*, amending the *Environmental Protection Act* and the *Ontario Water Resources Act*, respectively.
- <sup>44</sup>D.Johnson, "The Ontario Party and Campaign Finance System," in F.Leslie Seidle, Provincial Party and Election Finance in Canada, (Ottawa: Royal Commission on Electoral Reform and Party Financing, 1991), pg.80.
- <sup>45</sup>Ibid., pg. 81.
- <sup>46</sup>Bill 36, *An Act to Amend the Election Act and the Election Finances Act, and to Make Related Amendments to Other Statutes, 1998* (Royal Assent June 26, 1998).
- <sup>47</sup>R.Mackie, "Tories easing election-spending laws," The Globe and Mail, June 10, 1998.
- <sup>48</sup>I. Urquhart, "Liberal's curb on ads worth a look," The Toronto Star, February 6, 1999. See also "Ads paid with tax funds," The Globe and Mail, March 27, 1999.

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<sup>49</sup> Bill 99, *The Balanced Budget and Taxpayer Protection Act, 1998*.

<sup>50</sup> *Ibid.*, s.7(1).

<sup>51</sup> See Bill 107 (the *Sewerage and Water Services Improvements Act, 1997*). The termination of the Municipal Assistance Program which provided provincial capital grants for municipal sewer and water services was announced on April 11, 1996.

<sup>52</sup> See Winfield and Jenish, Ontario's Environment and the 'Common Sense Revolution: A Third Year Report, pp.109- 110.

<sup>53</sup> The termination of provincial funding for curbside recycling programs was announced November 29, 1995.

<sup>54</sup> ECO, Annual Report 1996, pp.17-20.

<sup>55</sup> See Bill 107, the *Water and Sewerage Services Improvements Act, 1997*, and Bill 152, the *Service Improvement Act, 1997*.

<sup>56</sup> Winfield and Jenish, Ontario's Environment and the CSR: A Second Year Report, pp.29-30.

<sup>57</sup> See Bill 20, *The Land-Use Planning and Protection Act, 1996*.

<sup>58</sup> Press Release "Draft Municipal Act Released for Consultation," February 11, 1998.

<sup>59</sup> M. Winfield and G. Jenish, Ontario's Environment and the 'Common Sense Revolution:' A First Year Report (Toronto: CIELAP, 1996), pg.62.

<sup>60</sup> Regulation 352/97.

<sup>61</sup> Winfield and Jenish, Ontario's Environment and the CSR: A Second Year Report, pg.103.

<sup>62</sup> See Bill 146, *The Farming and Food Production Protection Act, 1998*.

<sup>63</sup> See Bill 103, *The City of Toronto Act, 1997*.

<sup>64</sup> See, for example, M. Campbell, I. Ross, G. Abbate, and M. Grange, "Metro voters reject amalgamation," The Globe and Mail, March 4, 1997.

<sup>65</sup> See M. Mittelstaedt, "Ipperwash computer records missing," The Globe and Mail, September 17, 1998.

<sup>66</sup> T. Claridge, "Ontario appeal court rejects aboriginal-hunting ruling," The Globe and Mail, June 11, 1997; "Manitoulin Indians drop hunting appeals," The Globe and Mail, September 19, 1998.

<sup>67</sup> R. Mackie, "Fight for Northern Ontario escalating," The Globe and Mail, August 5, 1998.

<sup>68</sup> ECO, Annual Report 1997 Supplement, pg.13.

<sup>69</sup> ECO, Annual Report 1996; ECO, Annual Report 1997.

<sup>70</sup> Provincial Auditor, 1997 Annual Report of the Provincial Auditor of Ontario (Toronto: Queen's Printer, 1997).

<sup>71</sup> 8th Biennial Report on Great Lakes Water Quality (Washington, D.C. and Ottawa: International Joint Commission, 1997); The IJC and the 21st Century (Washington, D.C. and Ottawa: International Joint Commission, 1997).

<sup>72</sup> Continental Pollutant Pathways (Montreal: North American Commission for Environmental Co-Operation, 1997).

<sup>73</sup> See, for example, Bill 20, the *Land Use Planning and Protection Act, 1996* amendments to the *Planning Act*.

<sup>74</sup> See Bill 57, *Environmental Approvals Process Improvements Act, 1997*.

<sup>75</sup> See Bill 26, the *Savings and Restructuring Act, 1996*, Schedule N. See also Ministry of Natural Resources - Press Release and Fact Sheets: "New Regulations Guide Activities on Crown Land," November 5, 1996.

<sup>76</sup> *House of Commons v. Canada (Labour Relations Board)* (1986, 27 D.L.R. (4th) 481 at p.494 (F.C.A.).

<sup>77</sup> See, for example, Re: changes to the rules of procedure under the NDP G. White "The Legislature: Central Symbol of Ontario Democracy," in G. White ed., The Government and Politics of Ontario (Toronto: University of Toronto Press, 1997), pg.81; under the Progressive Conservatives: "Tory rule changes are anti-democratic" (editorial) The Toronto Star, June 20, 1997; and I. Urquhart, "Closure has disarmed opposition," The Toronto Star, December 18, 1997.

<sup>78</sup> See J. Castrilli and M. Winfield, The Ontario Regulation and Policy-Making Process in a Comparative Context: Exploring the Possibilities for Reform (Toronto: Environmental Commissioner of Ontario, October 1996), pg.25.

<sup>79</sup> Standing Committee on Regulations and Private Bills, Second Report, (Toronto: Legislative Assembly of Ontario, 1988), Recommendation 9.

<sup>80</sup>House of Commons, Standing Order 108.

<sup>81</sup>Standing Committee on Environment and Sustainable Development, Keeping a Promise: Towards a Sustainable Budget (Ottawa: House of Commons, 1995).

<sup>82</sup>Standing Committee on Environment and Sustainable Development, The Regulation of Biotechnology: A Matter of Public Confidence (Ottawa: House of Commons, November 1996).

<sup>83</sup>A.MacIlroy, "Ottawa fails on environment: report," The Globe and Mail, May 23, 1998.

<sup>84</sup>See G.White, The Ontario Legislature, ch.6.

<sup>85</sup>See for example, Report of the Select Committee on Ontario Hydro Nuclear Affairs (Toronto: Legislative Assembly of Ontario 1st Session, 36th Parliament, 1997).

<sup>86</sup>See note 65.

<sup>87</sup>White, The Ontario Legislature, pp.226-229.

<sup>88</sup>The Commission should include the rules of procedure, roles of committees, representation (including the number of members, design of ridings to reflect roughly equal number of voters, municipal boundaries, ecological boundaries, and allowance for representation in far North) and party and electoral financing.

<sup>89</sup>Standing Committee on Regulations and Private Bills, Second Report, Recommendation 1.

<sup>90</sup>Castrilli and Winfield, The Ontario Regulation and Policy-Making Process in a Comparative Context, pg.33.

<sup>91</sup>Ibid., pp.22-24.

<sup>92</sup>Prof. Hudson N. Jarisch, Faculty of Law, University of Toronto, Testimony to the Standing Committee on Regulations and Private Bills, Legislative Assembly of Ontario, March 24, 1988, pg.T-6.

<sup>93</sup>Standing Committee on Environment and Sustainable Development, Enforcing Canada's Pollution Laws: The Public Interest Must Come First! (Ottawa: House of Commons, May 1998), Recommendation 22.

<sup>94</sup>Environmental Assessment Advisory Committee, Reforms to the Environmental Assessment Program (Toronto: Ministry of the Environment, 1991).

<sup>95</sup>R.B. Gibson and B.Savan, Environmental Assessment in Ontario (Toronto: Canadian Environmental Law Research Foundation, 1986).

<sup>96</sup>R.Northey, The 1995 Annotated Canadian Environmental Assessment Act and EARP Guidelines Order (Toronto: Carswell, 1994), pp.585-589.

<sup>97</sup>This could include such factors as the maintenance or enhancement of ecosystem integrity and the preservation of valued ecosystem components, strengthening renewable resource activities, and the enhancement of other aspects of the economic, cultural, social, educational, and health base for long-term community well-being.

<sup>98</sup>See, for example, Report of the Auditor General of Canada to the House of Commons/Chapter 22 Federal Contaminated Sites - Management Information on Environmental Costs and Liabilities (Ottawa: Minister of Public Works and Government Services, November 1996); Report of the Commissioner of the Environment and Sustainable Development to the House of Commons 1998 (Ottawa: Minister of Public Works and Government Services Canada, 1998).

<sup>99</sup>Standing Committee on Environment and Sustainable Development, Keeping A Promise: Towards a Sustainable Budget (Ottawa: House of Commons, December 1995).

<sup>100</sup>Winfield and Jenish, Ontario's Environment and the Common Sense Revolution: A Third Year Report pp.22-23.

<sup>101</sup>See Standing Committee on the Legislative Assembly, Report on the MFIPPA, Recommendation 133.

<sup>102</sup>Standing Committee on the Legislative Assembly, Review of the FOIPPA, Recommendations 5-21.

<sup>103</sup>See the comments of the Freedom of Information and Protection of Privacy Commissioner, quoted in Standing Committee on the Legislative Assembly, Report on FOIPPA, pp.35-36.

<sup>104</sup>J.Swaigen and D. Estrin, eds., Environment on Trial: A Guide to Ontario Environmental Law and Policy (Toronto: Emond-Montgomery Publications Ltd. and the Canadian Institute for Environmental Law and Policy, 1993), pg.16.

<sup>105</sup>This would include such things as permitting the delegation of decision-making authority to committees of council of community Councils in the City of Toronto.

<sup>106</sup> for revisions to the *Municipal Act* released by the Province in February 1998, for example, proposed to give municipalities authority to enact by-laws in the areas of: health, safety, protection and well-being of people and the protection of properties; public utilities; waste management; highways, including parking and traffic on highways; transportation systems, such as transit, airports and ferries; the natural environment; culture, parks, recreation and heritage, economic development; nuisance, noise, odour, vibration, illumination and dust; drainage and flood control; structures including fences and signs; parking; and animals. However, the province's proposals would also impose a number of significant constraints on municipal action. See Ministry of Municipal Affairs, Press Release "Draft Municipal Act Released for Consultation," February 11, 1998.

<sup>107</sup>Quoted in J.Geddes, "Tougher insider laws urged," The Financial Post, February 7, 1996.

<sup>108</sup>Industry Canada, Industry Strategy Sustainable Development Strategy (Ottawa: December 1997), section 3.1.1. "Marketplace Rules and Services."

<sup>109</sup>See [www.investorguide.com/EdGAR.htm](http://www.investorguide.com/EdGAR.htm).

<sup>110</sup>M.Jantzi Research Associates Inc. Response to Industry Canada's Canada Business Corporations Act Supplement to Discussion Paper: Proposals for Technical Amendments July 1996: Part XII "Shareholder Proposals" (Toronto: Canadian Friends Service Committee, August 1996), pg.6.

<sup>111</sup>M.Jantzi Research Associates Inc. Response to Industry Canada's Canada Business Corporations Act Supplement to Discussion Paper: Proposals for Technical Amendments July 1996: Part XII "Shareholder Proposals."

<sup>112</sup>Ministry of Environment and Energy, Policy and Guideline on Access to Environmental Evaluations (Toronto, November 1995).

<sup>113</sup>, Voluntary Measures to Ensure Environmental Compliance, (Montreal: North American Commission on Environmental Cooperation, 1997), pp.62-63. See also R.Nadarajah, "Comment on the Ministry of Environment and Energy's draft Policy and Guideline on Access to Environmental Evaluations" (Toronto: Canadian Environmental Law Association, March 1995).

<sup>114</sup>North American Commission on Environmental Cooperation report highlights section 70 of the Nova Scotia *Environmental Protection Act, 1995* as a potential model for the granting of immunity from prosecution on the basis of the voluntary submission of information obtained through a environmental audit of environmental site specific assessment of non-compliance. Voluntary Measures to ensure Environmental Compliance, pp.59-60, 62-63.

<sup>115</sup>This would include: the *Environmental Protection Act*; the *Ontario Water Resources Act*, the *Environmental Assessment Act*; the *Pesticides Act*; the *Crown Forest Sustainability Act*; the *Public Lands Act*; the *Lakes and Rivers Improvements Act*; the *Fish and Wildlife Conservation Act*; the *Mining Act*; the *Aggregate Resources Act*; the *Petroleum Resources Act*; the *Provincial Parks Act*; and the *Planning Act*.

<sup>116</sup>See: Rick Lindgren, Submissions of the CELA to the Standing Committee on Social Development Regarding Bill 76 (CELA, July 1996).

<sup>117</sup>Nadarajah, Comments on MoE's Proposal for Standardized Approval Regulations and Approval Exempting Regulations (CELA, March 1998).

<sup>118</sup> 1990, c.E.18.

<sup>119</sup>Bill 76 [need full cite]

<sup>120</sup>See: ...need good cites [see EA paper]

<sup>121</sup>Taro Aggregates East Quarry Landfill EA, EA file No. PR-TA 02.

<sup>122</sup>Proposals that pose a significant threat to the environment may in fact be evaluated on the basis of a very narrow range of factors, whereas less significant proposals may be subject to a wide ranging environmental assessment, depending upon the TOR in each case. Compare Adams mine to Quinte. [perhaps a sidebox]

<sup>123</sup>For instance, see sections 5.1, 6((3), and 6.1(2)e, which basically state that the proponent shall consult "such persons as may be interested" and must provide "a description of the consultations by the proponent and the results of the consultation".

<sup>124</sup>KPMG, Canadian Environmental Management Survey, 1994 (KPMG, 1994).

<sup>125</sup>As of June 21, 1998.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice to ensure transparency and accountability.

2. The second section outlines the procedures for handling discrepancies between the recorded amounts and the actual cash received. It states that any such variance should be investigated immediately and reported to the appropriate authority.

3. The third part of the document details the process of reconciling the accounts at the end of each month. It requires that the total amount recorded in the books should match the total amount shown in the bank statements.

4. The fourth section discusses the role of the auditor in verifying the accuracy of the financial records. It notes that the auditor should conduct a thorough review of all entries and supporting documents to ensure compliance with the relevant regulations.

5. The fifth part of the document provides guidance on the proper use of the company's funds. It states that all expenditures should be for the benefit of the company and should be properly documented.

6. The sixth section discusses the importance of maintaining the confidentiality of financial information. It requires that all records be stored securely and that access be restricted to authorized personnel only.

7. The seventh part of the document outlines the consequences of non-compliance with the financial reporting requirements. It states that any failure to maintain accurate records or to report discrepancies may result in disciplinary action.

8. The eighth section discusses the role of the management in ensuring the integrity of the financial reporting process. It requires that the management should establish a strong internal control system and should monitor its effectiveness regularly.

9. The ninth part of the document provides a summary of the key points discussed in the document. It emphasizes that the primary goal is to ensure the accuracy and reliability of the financial records.

10. The tenth and final section discusses the importance of ongoing training and education for all staff involved in the financial reporting process. It states that regular training is essential to ensure that all staff are up-to-date on the latest regulations and best practices.

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